Planning and Environmental Consultants

# Construction and Environmental Management Plan

## Markievicz Bridge Scour Repairs, Co. Sligo

# DOCUMENT DETAILS

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| Prepared By: | **MKO**<br>**Tuam Road**<br>**Galway**<br>**Ireland**<br>**H91 VW84** |

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# 1. INTRODUCTION

This Construction & Environmental Management Plan (CEMP) has been prepared by MKO on behalf of PUNCH Consulting Engineers Ltd who have been engaged by Sligo County Council to provide engineering consultancy services to facilitate the Proposed Works on Markievicz Bridge which allows southward passage from the R286 regional road over the Garavogue River in the centre of Sligo Town, Co. Sligo.

This CEMP will provide the environmental management framework to be adhered to during the pre-commencement and construction phases of the development and it incorporates the mitigating principles to ensure that the work is carried out in a way that minimises the potential for any environmental impacts to occur.

All measures identified in this CEMP, which will be finalised subsequent to any permission granted and updated prior to construction, will include all mitigation measures identified to be adhered to during the pre-commencement and construction phases of the Proposed Works.

The CEMP to be prepared by the appointed contractor will be a single, amalgamated document that can be used during the construction phase of the project, as a single consolidated point of reference relating to all construction, environmental and drainage requirements for the Planning Authority, developer and contractors alike. The CEMP may evolve over further iterations as the construction works progress, but at all times must meet or exceed the standards and requirements set out in this document. It will be the contractor's current version of the CEMP, which at any point in time, will guide the construction activities and the implementation of which will be audited during construction.

## 1.1 Scope of the Construction and Environmental Management Plan

This report is presented as a guidance document for the management of construction activities and waste materials generated during the works and following completion. It clearly outlines the mitigation measures that are required to be adhered to in order to complete the works in an appropriate manner.

The report is divided into Seven sections as outlined below:

- **Section 1** provides a brief introduction as to the scope of the report, detailing the targets and objectives of this plan.
- **Section 2** outlines the Site and Project details, along with providing an overview of construction methodologies that will be adopted throughout the project.
- **Section 3** sets out details of the environmental controls on site which looks at noise and dust controls. Site drainage measures and a waste management plan are also included in this section.
- **Section 4** sets out a fully detailed implementation plan for the environmental management of the project outlining the roles and responsibilities of the project team. The Emergency Response Plan to be adopted in the event of an emergency in terms of site health and safety and environmental protection is also included in this section.
- **Section 5** consists of a summary table of all mitigation proposals to be adhered to during the Proposed Works
- **Section 6** consists of a summary table of all monitoring proposals to be adhered to during the Proposed Works
- **Section 7** sets out a programme for the timing of the works.
- **Section 8** outlines the proposals for reviewing compliance with the provisions of this report.

## 1.2 Targets and Objectives

The following key targets and objectives will inform the final detailed design including consideration of the buildability of the designs that emerge:

- Adopt a sustainable approach to construction and, ensure sustainable sources for materials supply where possible.
- Correct fuel storage and refuelling procedures to be followed.
- Construction Methods and designs will be altered where it is found there is an adverse effect on the environment.
- Good waste management and housekeeping to be implemented.
- Avoidance of vandalism.
- Air and noise pollution prevention to be implemented.
- Monitoring of the works and any adverse effects that it may have on the environment and,
- Provide adequate environmental training and awareness for all project personnel.

The key site objectives are as follows.

- Keep impact of repair works to a minimum on the local environment and wildlife.
- Ensure construction works and activities are completed in accordance with any planning conditions for the development.
- Ensure construction works and activities have minimal impact/disturbance to local landowners and the local community.
- Ensure construction works and activities have minimal impact on the Natural Environment.

# 2. SITE AND PROJECT DETAILS

## 2.1 Site Location

The Proposed Works site is located at the Markievicz Bridge (traditionally known as the 'New Bridge') located at Bridge Street, Sligo Town. Irish Transverse Mercator (ITM) coordinates for the location of the Proposed Works are 569282 X, 835960 Y. The Markievicz bridge spans the Garavogue River, located in the centre of Sligo Town and utilised both by both pedestrians and motorists. The bridge was erected in 1648, and it connects the north and south sides of Sligo across the Garavogue River. The bridge is located within a built urban area, with buildings, footpaths and roads immediately adjoining the bridge on either side of the Garavogue River. Access to the bridge is via the R286 regional road which is adjoins the Markievicz bridge in the centre of Sligo Town. The location of the bridge is shown in Figure 2-1 below

The Proposed Works on the Garavogue River is located within the Lough Gill SAC (001976), 240m upstream from Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC (000627) and 700m upstream from Cummeen Strand SPA (004035).

For a full list of Nationally and European Union (EU) Designated Sites, see the Natura Impact Statement (NIS) and Ecological Impact Assessment (EcIA) which have been prepared for this proposed project.

## 2.2 Description of the Proposed Works

### 2.2.1 Proposed Works

The Markievicz Bridge was built in 1648 and has been an important crossing point through the middle of Sligo Town for both pedestrians and vehicles. Over the years, significant damage has occurred to the bridge as a result of scour damage to the bridge piers.

The channel bed has been eroded in the vicinity of the bridge as a result of contraction scour, causing a significant hydraulic jump at the upstream face of the bridge. The scour damage can be attributed to the sudden expansion of water as it leaves the confines of the bridge arches. The piers have also been undermined to varying degrees as a result of scouring effects. The extent of the scour damage has the potential to result in a decline in the structural integrity of the Markievicz Bridge.

Detailed inspections of the Markievicz Bridge have determined that the existing vegetation growth is not currently causing structural damage, however if proper routine maintenance is not regularly undertaken, advanced vegetation growth has potential to impact the structural integrity of a structure. Therefore, the removal of the vegetation before it progresses to this stage is in the best interests of the structural condition of the bridge.

The following sections detail the proposed methodologies for repairing the riverbed scour damage, the scour damage to the bridge abutments/piers as well as the de-vegetation works on the exterior of the bridge.


## Map Legend

- SIte Location
- Markievicz Bridge Boundary
- Extent of dewatered area
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Garavogue River
- WFD Sub-Catchment
- WFD Catchment



Drawing Title

# Site Location

Project Title

Markievicz Bridge Scour Repairs

| Drawn By | Checked By |
|---|---|
| EF | SM |
| Project No. | Drawing No. |
| 220943 | Figure 2-1 |
| Scale | Date |
| 1:50,000 | 04/03/2025 |

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email:info@mkoireland.ie
Website: ww.mkoireland.ie

# 2.3 Construction Management

## 2.3.1 Introduction

The appointed contractors for the construction of the Proposed Works will be required to comply with this CEMP and any revisions made to this document throughout the construction phase.

An overview of the anticipated Construction Methodologies is provided below.

## 2.3.2 Overview of Proposed Construction Methodology

The proposed anticipated construction methodology is summarised under the following main headings:

- Site Establishment.
- Dry Working Area Establishment
- Structural Masonry Peir Scour Repairs on the Markievicz Bridge
- Riverbed Scour Repairs
- De-vegetation

### 2.3.2.1 Site Establishment

Access to the existing piers and riverbed will be from the R870 regional road which crosses the Garavogue River via Markievicz Bridge. Due to the nature of the works, appropriate signage will be provided at the works areas to alert traffic and pedestrians to the construction activities and related traffic at the works locations. The contractor for the Proposed Works will be required to undertake the following.

- Operate a Site Induction Process for all site staff.
- Ensure all site staff shall have current 'Safe Pass' cards.
- Maintain Site Security staff at all times.

Temporary traffic lights will be set up on the southern end of Markievicz Bridge, adjacent to the Rockwood Parade and John F. Kennedy Parade. A construction site compound will be established at the John F. Kennedy Parade which will comprise of temporary car parking, deliveries area, material storage, welfare facilities, and a mobile crane as required. See the Temporary Traffic Management and Site Setup Drawings in the Appendix A of this CEMP provided by PUNCH Consulting engineers for further details.

### 2.3.2.2 Dry Works Area Establishment

A dry working area will be established spanning half of the width of the Garavogue River at a time. The total dry working area will be approximately 980m$^2$ in total and will extend approximately 6m upstream of the bridge and approximately 15.5m downstream of the bridge. The dry working area will be in place for the duration of the works (approximately 6 months total; approximately 3 months for each half of the Proposed Works) in order to carry out all of the pier scour repairs, the riverbed scour repairs, as well as de-vegetation on the bridge masonry surface. Once one section (approximately half of the bridge structure) has been completed, the dry working area will be removed and a new dry working area will be established on the other side of the river, ensuring that water will always be allowed to flow freely around the dry working area.

The following methodology will be used to create the dry working area within the Garavogue River:

- All works will be carried out in accordance with IFI (2016) *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*
- A mobile crane will be set up in the construction site compound at street level with full access to the works areas and delivery areas.
- The dry working area will span approximately half of the river at any given time.
- The area will be electro-fished by qualified personnel in advance of dewatering the works area.
- Tonne bags filled with clean inert sand will be lowered into the section of the river to be dewatered.
    - The tonne bags will be double stacked and arranged to form the walls of the dry works area.
    - An impermeable, plastic membrane will be used to seal off the area.
    - Smaller sandbags will also be used to fully seal the inside of the dewatering area from excessive water ingress, and to weigh down the impermeable plastic membrane.
- A sump will be dug within the proposed dry working area.
- Water will be pumped from inside the dewatering area to pumps located in the construction site compound area along the south riverbank.
- Dewatering of the dry working area will be carried out by pumping the water out of the sump in the dry working area, through the pump system located within the construction compound, which will be fitted with a silt buster.
- The pumped water from the dry working area will be pumped through the silt buster into the area confined by a silt curtain within the Garavogue River. The mouth of the return pipe will be located behind the silt curtain within the river.

Once the dry working area has been established and is free form water ingress, the structural masonry pier scour repairs, riverbed scour repairs and the de-vegetation works will commence.

#### 2.3.2.3 Pier Scour Repair

The proposed repairs on the pier footings of the Markievicz Bridge will be carried out in order to reverse the current and prevent future local scour effecting the structural integrity of the bridge by extending the pier footings further below ground level. All repair works will be in accordance with CIRIA C742 Manual on scour at bridges and other hydraulic structures, including supplementary guides.

The proposed bridge pier scour repairs will involve the following steps:

- All works will be carried out within the dry working area as outlined in Section 2.3.2.2 above.
- Loose materials will be removed from beneath the masonry piers where the scour damage has occurred within the riverbed. The area will be hand excavated to competent material.
- A concrete letterbox framework will be installed at the edge of the hand-excavated area up to the competent material retained on the masonry pier.
- The area within the letterbox framework up to competent material will be filled with high early strength self-compacting concrete.
- The concrete formwork will then be removed and the concrete letterbox protrusion remaining will be cut off.

A drawing of the Structural Masonry Pier Scour Repairs can be found below in Appendix B to this CEMP

#### 2.3.2.4 Riverbed Scour Repair

The proposed scour repairs on the riverbed beneath the Markievicz Bridge and immediately downstream of the bridge will be carried out in order to reverse the current contraction scour and delay its recurrence by repairing the channel bed in the vicinity of the bridge.

The total works area is approximately 980m2, however it should be noted that scour repairs will be required within a fraction of this total area. Scour repairs will only take place in areas of the riverbed that have scoured away creating scour holes. These locations can be seen in Appendix B to this CEMP.

Scour damage upstream of the Markievicz Bridge is relatively minor and shallow. This area will require minimal works and will only require re-spreading of the existing riverbed materials where scour damage has occurred. The materials will be re-spread to natural riverbed finish levels. See Appendix B to this CEMP for drawings showing this. All repair works will be in accordance with CIRIA C742 Manual on scour at bridges and other hydraulic structures, including supplementary guides.

The riverbed scour repairs on the Garavogue River beneath the bridge arches and downstream of the bridge will involve the following steps:

- A dry working area within the river will be created as outlined in Section 2.3.2.2 above.
- A 1.5 tonne electric mini digger will be used to infill the existing scour holes on the riverbed.
- A geotextile membrane layer will be placed along the riverbed
- Granular fill material will be used to in-fill the larger scour holes
- Rock rip-rap will be placed on top of the granular material to in-fill the larger scour holes
    - 250mm rock rip-rap will be used
- Where riverbed material has deposited on the riverbed next to scour holes, this material will be re-spread over the rock rip-rap, where possible.
- The riverbed will be finished to natural levels

#### 2.3.2.5 De-vegetation

De-vegetation works will be undertaken while a dry working area is in place within the riverbed. The entire masonry surface area of the bridge will be de-vegetated, cleaned and repointed.

All vegetation will be removed from the surface of the bridge by hand. Steam and/or abrasive cleaning will then be undertaken on the stone masonry of the bridge, followed by extensive mortar joint re-pointing using lime mortar where it is required.

The de-vegetation works will be carried out by fully scaffolding the bridge elevations within the dewatered areas.

### 2.3.3 Construction Works Sequence

It is anticipated that the Proposed Works will take approximately 3 months to complete. The proposed construction working hours will be 07:00-19:00 Monday to Friday. and construction will not take place at the site on weekends or Public Holidays. All construction works should be undertaken during the dry weather periods when the river level is low. The sequencing of construction phase works has is summarised Table 2-1.

*Table 2-1 Sequence of Operations for the Construction Phase*

| No. | Construction Works |
|---|---|
| 1. | Site Setup including compound establishment, erecting of signage, barriers, and lights for traffic control |
| 2. | Establishment of dry works area at riverbed level as required. |
| 3. | Excavation of material to firm bearing strata. |
| 4. | Construction and filling of “Letterbox” formwork around piers. |
| 5. | Removal of “Letterbox” formwork and concrete protrusion. |
| 6. | Lining of reduced riverbed with geotextile layer. |
| 7. | Backfilling with granular fill and 250mm rock riprap as required. |
| 8. | Spreading final layer of existing riverbed material, where applicable |
| | De-vegetation, steam cleaning, and mortar joint repointing |

# 3. ENVIRONMENTAL MANAGEMENT

## 3.1 Protecting Water Quality

The Proposed Works involve the repair of the pier footings and the surrounding riverbed of the Markievicz Bridge in Sligo Town on the Garavogue River (Code: IE_WE_35G010200) which is located within and adjacent to a number of EU designated sites and Proposed Natural Heritage Areas (pNHA's).

Prior to the commencement of any repair works or construction activities, the necessary mitigation measures will be put in place. Particular emphasis will be placed on hazardous materials entering nearby surface waters as well as spill or leaks of fuel and oils. Section 4 provides an Emergency Response Plan for dealing with spillages which may result in adverse environmental effects.

### 3.1.1 Prevention Pollution Control Measures

The works area is located within the Garavogue River. In order to mitigate against the potential of negative effects on the Garavogue River and further downstream waterbodies, the following measures will be implemented:

- No works will take place during periods of high rainfall to reduce run-off, potential siltation of watercourses and potential inundation of the dry working area. 'High rainfall' is defined as follows:
  - Rainfall >10 mm/hr (i.e. high intensity localised rainfall event)
  - Rainfall >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day) or,
  - Rainfall total greater than monthly average recorded in 7 consecutive days (prolonged heavy rainfall over a week).
- All works will be undertaken during dry weather periods (see definition above) and when river levels are low.
- The appointed contactor will be fully briefed by an ecologist as to the sensitive nature of the site and the required mitigation measures.
- The construction compound area will be surrounded with a solid fencing to prevent surface water run off to the river. See
- Rewetting of the dry working area will only take place once all concrete has been allowed to cure for the appropriate time period.
- Stockpiling of materials will be carried out temporarily within the dry working area and periodically removed throughout the works. No stockpiled materials will be left within the dry working area overnight.
- Temporary stockpiling will take place within the materials storage area, the location of which is shown in the Temporary Traffic Management and Site Set-up Drawing in Appendix A to this CEMP.

### 3.1.2 Instream Works

- All construction methods will adhere to Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters;
- No works will be undertaken during Spring Tides. All materials and machinery will be removed from the site prior to any Spring Tides or during periods of heavy rainfall.
- Prior to the commencement of works, Inland Fisheries Ireland (IFI) will be notified, and no instream works shall be carried out during the closed season for instream works (October 1st to June 30th). Any works associated with the Proposed Works will only be

carried out during the fisheries open season which is from 1st July to 30th of September each year;
- No instream works will be carried out outside of dry working area
- The dry working area will be fully sealed using 1-Tonne bags filled with clean inert sand to avoid any water ingress. Smaller sandbags will also be used to fully seal the inside of the dewatering area from excessive water ingress, and to weigh down the impermeable plastic membrane.
- The working area will be electro-fished by qualified personnel in advance of dewatering the works area.

### 3.1.3 De-watering

- A pump will be located within the construction compound at street level. Dewatering of the dry working area will be carried out by pumping the water out of the sump in the bunded, dry working area, through the pump system located within the construction compound, which will be fitted with a silt buster. The silt bag or silt buster will allow the water to flow through the geotextile fabric and will trap any of the finer silt and sediment remaining in the water
- A silt curtain will be established downstream of the dry working area, attached to the bankside.
- The mouth of the return pipe will sit above the water level to prevent the pipe from being submerged under water.
- The pumped water from the dry working area will be pumped through the silt buster into the area confined by the silt curtain within the Garavogue River.
- Automated turbidity metres will be installed upstream and downstream of the Proposed Works area for suspended solids, and these will be monitored regularly by a suitably qualified ecologist. If there is a 20% difference between the downstream reading and the upstream reading, then all works will be halted until the source of the problem is rectified.
- Bio-security measures such a washing of vehicles, plant and equipment prior to mobilisation and de-mobilisation will be adhered to as detailed in the biosecurity measures in Section 3.6 below
- Rewetting of the dry working area will only take place once all concrete is completely cured.

### 3.1.4 Refuelling, Fuel and Hazardous Materials Storage

The following measures are proposed to avoid release of hydrocarbons:

- Lubricants and hydraulic fluids for equipment used on the site will be carefully handled to avoid spillage and provided with spill containment.
- All site plant will be inspected at the beginning of each day prior to use. Defective plant shall not be used until the defect is satisfactorily fixed. All major repair and maintenance operations will take place off site.
- No vehicles or machinery which use hydrocarbons will be used within the dry working area on the riverbed. The only machinery required to be used within the dry working area will be an electric 1.5 tonne mini digger which will be lowered into the dry working area using a mobile crane.
- Outside of working hours, plant machinery will be parked within the dedicated vehicle parking area in the construction compound, at a minimum distance of 10m from the watercourse.
- No tools or potentially toxic materials will be stored or left within the dry working area overnight or when there is danger of the dry working area being inundated with water.

- The storage of oils, fuel, chemicals, hydraulic fluids, etc. will be undertaken in accordance with current best practice for oil storage (BPGCS005, Enterprise Ireland[1]) on an impervious base within a bund and appropriately secured;
- Any fuel storage required will be stored at street level, outside of the in-stream works, within a dedicated materials storage area at street level which is shown in the Temporary Traffic Management and Site Set-up Drawing in Appendix A to this CEMP.
- All machinery operating on-site will be steam-cleaned in advance of works as set out in Section 3.6 of this CEMP and routinely checked to ensure no leakage of oils or lubricants occurs;
- Potential impacts caused by any spillage of fuels, lubricants or hydraulic oils will be reduced by keeping spill kits at locations within the construction site compound at street level, and accidental spills will be immediately contained, and the contaminated soil removed from the area and properly disposed of;
- Oil booms and oil soakage pads will be kept at the construction compound and fuel storage area to deal with any accidental spillage;
- All fuels, lubricants and hydraulic fluids shall be kept in secure bunded units at the dedicated storage area. The bunded area shall accommodate 110% of the total capacity of the containers within it.
- Containers shall be properly secured to prevent unauthorised access and misuse. An effective spillage procedure shall be put in place with all staff properly briefed. Any waste oils or hydraulic fluids shall be put in place with all staff properly briefed. Any waste oils or hydraulic fluids shall be collected, stored in appropriate containers and disposed of offsite in an appropriate manner;
- No refuelling will take place within the construction compound. Refuelling will only take place at a dedicated refuelling facility.
- Spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment;
- All plant and machinery shall be regularly maintained and serviced to minimise release of hydrocarbons.
- Contractors will establish dedicated secure areas at the construction compound for the storage of fuel and chemicals in mobile bowsers.
- The pump located within the construction compound will be bunded.

### 3.1.5 Dust Control

Construction dust can be generated from many on-site activities. The extent of dust generation will depend on the type of activity undertaken, the location, the nature of the dust. In addition, dust dispersion is influenced by external factors such as wind speed and direction and/or, periods of dry weather. Construction traffic movements also have the potential to generate dust as they travel along the public road.

Proposed measures to control dust include:

- The public roads will be regularly inspected by Site Management for cleanliness and cleaned as necessary.
- Material handling systems and material storage areas, if required will be designed and laid out to minimise exposure to wind.
- Transport of aggregates or other material, which has the potential to generate dust, will be undertaken in tarpaulin-covered vehicles where necessary.
- Daily inspection of construction site to examine dust measures and their effectiveness.

[1] Best Practice Guide BPGCS005 Oil Storage Guidelines

### 3.1.6 Cement-based Products

- All concrete will be transferred to the dry working area by chute from the construction site compound into a fully sealed, bunded container.
- All concrete placing will be conducted under controlled conditions to prevent any potential runoff to the river;
- All formworks will be adequately constructed and sealed to prevent leakage or spillage and will have sufficient capacity to support all poured concrete;
- Regular pH checks will be carried out on any pumped water from the dry working area during cement works. If there is a significant difference in pH between the pumped water and baseline pH reading, then all works will be halted until the source of the problem is rectified.
- No batching of wet concrete will occur within the dry working area.
- Only ready-mixed, self-compacting wet concrete products and pre-cast concrete will be used within the dry working area for the scour repairs on the bridge piers. No mixing of wet concrete will occur within the riverbed at any time.
- Raw or uncured waste concrete shall be removed from the site for appropriate disposal or reuse;
- Concrete trucks will be directed back to their batching plant for washout;
- Clearly visible signs shall be placed in prominent locations close to concrete pour areas, stating that washout of concrete lorries is not permitted on the site; and,
- Concrete pour sites shall be free of standing water to mitigate the risk of run-off being polluted with cementitious material.
- Concrete pours shall be avoided where prolonged periods of heavy rain are forecast, and covers shall be available and used for freshly placed concrete to avoid the surface washing away in heavy rain.

## 3.2 Noise Control

The Proposed Works require that the only plant to be used within the confines of the river to be an electric 1.5 tonne mini digger to reduce the likelihood of contamination of Garavogue River. A mobile crane will be set up in the temporary construction site compound along the John F. Kennedy Parade on the southern riverbank (see Traffic Management and Site Setup Drawing in Appendix A to this CEMP) which will be used intermittently to move the sandbags and electric 1.5 tonne mini digger down to riverbed level. A bunded water pump will also be utilised from the construction compound to establish a dry works area once it has been sealed off as outlined in Section 2.3.2.2.

Noise levels shall be kept below those levels specified in the National Roads Authority – *"Guidelines for the Treatment of Noise and Vibration in National Roads Schemes"* or such further limits as imposed by Sligo County Council. The Proposed Works shall comply with BS 5228 *"Noise Control on Construction and open sites Part 1: Code of practice for basic information and procedures for noise control."*

Proposed measures to control noise include:

- Construction equipment for use outdoors shall comply with the European Communities Regulations– Noise Emission by Equipment for Use Outdoors – SI 241 - 2006.
- If utilised, diesel generators will be enclosed in sound proofed containers to minimise the potential for noise impacts.
- Any construction plant and equipment to be used on-site will be modern equipment and will comply with the "European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1996".
- Plant with the potential of generating noise or vibration will be placed as far away from sensitive properties as permitted by site constraints.

- Regular maintenance of plant will be carried out in order to minimise noise emissions. Particular attention will be paid to the lubrication of bearings and the integrity of silencers.
- All plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the works.
- If compressors are required, they will be of the "sound reduced" models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.
- Machines such as cranes and pumps, which will be used intermittently, will be shut down during those periods when they are not in use.
- Training will be provided by the Site Management to drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation.

It is recommended that drivers of heavy goods vehicles (HGVs) associated with the development extend due care and courtesy to other road users. Excessive engine revving will be avoided at all times.

The proposed construction working hours will be 07:00-19:00 Monday to Friday. Construction will not take place at the site on weekends or Public Holidays.

Deviation from these times will only be allowed in exceptional circumstances where written approval has been received from the planning authority and when other relevant third parties i.e., nearby homeowners and property owners have been notified and have agreed to works taking place during such time periods.

## 3.3 Vibration Control

Vibration standards can be considered in two varieties: those dealing with human comfort and those dealing with cosmetic or structural damage to buildings. For example, vibration is perceptible at around 0.5 mm/s in the case of road traffic, however at higher magnitudes, this vibration may become an annoyance. Guidance relevant to the protection of building structures is contained in the following documents:

- British Standard BS 7385: 1993: Evaluation and Measurement for Vibration in Buildings Part 2: Guide to Damage Levels from Ground Borne Vibration.
- British Standard BS 5228: 2009+A1 2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration.

Vibration can be more difficult to control than noise, and there are few generalisations which can be made about its control. It should be borne in mind that vibration can cause disturbance by causing structures to vibrate and radiate noise in addition to perceptible movement. The following mitigation measures will be implemented at the site during the construction phase to control vibration levels:

- The hours of working should be planned, and account should be taken of the effects of vibration upon persons in areas surrounding site operations and upon persons working on site, considering the nature of land use in the areas concerned and the duration of work.
- Where reasonably practicable, low vibration working methods should be employed. Consideration should be given to use of the most suitable plant, reasonable hours of working for operations which might give rise to perceptible vibrations, and economy and speed of operations.
- Vibration should be controlled at source and the spread of vibration should be limited.
- Where reasonably practicable, plant and/or methods of work causing significant levels of vibration at sensitive premises should be replaced by other less intrusive plant and/or methods of working.

- Vibration from stationary plant (e.g. generators and pumps) can, in some instances, prove disturbing when located close to sensitive premises or when operating on connected structures. In these instances, equipment should be relocated or isolated using resilient mountings.
- Best practice vibration control measures will be employed by the contractor.

## 3.4 Traffic Management Proposals

The proposed traffic management measures to be adopted during the construction works are summarised below. Please note that this is not an exhaustive list, and it will be updated accordingly by the appointed contractor in consultation with the local authority. A Temporary Traffic Management and Site Setup drawing has been provided by PUNCH consulting engineers which outlines traffic management in greater detail. These are included in Appendix A of this CEMP.

- Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction works locations.
- Construction and delivery vehicles will be instructed to use only the approved and agreed means of access; and movement of construction vehicles will be restricted to these designated routes.
- Access routes will be clearly marked / identified. Access during construction to any working areas will be restricted to land within the outlined works area
- Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on HGVs carrying dust producing material.
- Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds.
- Parking of site vehicles will be managed and will not be permitted on public road, unless proposed within a designated area that is subject to traffic management measures and agreed with Sligo County Council.
- Deliveries of construction materials will be planned to ensure that the materials are delivered only as they are required and will avoid peak hours when possible.
- All vehicles will be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol or diesel. All scheduled maintenance will not be carried out on the public highway.

Works areas will not be open to members of the public. When vehicles are entering the construction site compound, or leaving the construction site compound, these movements will be supervised by designated members of staff who will act as road marshals. Traffic cones, lights and set-back signage will be put in place to warn and safely direct vehicles and cyclists around obstructions, if required.

## 3.5 General Ecological Mitigation Measures

The following ecological based mitigation measures will be implemented at the site during the construction phase. These are also listed in the accompanying Natura Impact Statement (NIS) and Ecological Impact Assessment (EcIA):

- Instream works will only be carried out during the fisheries open season which is from 1st July to 30th of September each year;
- No works will take place during the spawning season for lamprey (May to June) and salmonid (November to March)
- Instream works will be carried out in consultation with Inland Fisheries Ireland (IFI) and in line with IFI (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters;

- The translocation individuals will be relocated to a suitable similar river habitat location within the same grid reference.
- Any material removed from the riverbed will be checked by a suitably trained Ecologist under a Section 14 licence via manual hand search for any aquatic fauna including lamprey and European eel. These species are known to rise to the surface of excavated material for easy recovery by net.
- A second check for aquatic fauna will be carried out once the material has been offloaded into the final disposal area in order to ensure a thorough search through the excavated silt.
- On a precautionary basis, if White Clawed Crayfish are found within the working area, these will be safely translocated in a similar manner under licence.
- The dry working area required for the in-stream works will only span half of the width of the river at any given time. The river will be left to flow through the remaining half of the river.
- The finished river level will not change from the existing levels.
- Following the completion of the construction phase, all materials remaining within the dry working area and all bunding materials (i.e. sandbags and plastic membranes) will be removed from the river. No materials shall be left within the river when the dry working area is rewet.

### 3.5.1 Bat Protection Measures

The following mitigation measures in relation to bats will be implemented at the site during the construction phase:

- A pre-commencement survey and inspection beneath the bridge arches will be undertaken to ensure that the known location of the existing roost is clearly identified, and to ascertain whether any additional crevices in the bridge have been occupied by bats. The requirement for a pre-commencement survey does not represent a lacuna in the survey assessment but is fully in line with industry best practice.
- A qualified ecologist will inspect the vegetation to be removed prior to works to ensure that no bats are roosting within, and to identify any potential crevices suitable to roosting bats beneath the bridge arches. Ivy will only be removed by hand or using hand tools.
- An ECoW will be present for all works beneath the arch with the known roost.
- The known roost location will be clearly marked out with tape or chalk.
- All staff will be made aware of the location of the roost and the mitigation measures.
- No steam cleaning or repointing works will be permitted within 2m of the roost location.
- All holes within the bridge structure not used by bats will be temporarily filled with bubble wrap to prevent bats from occupying these locations for the duration of the construction phase. The bubble wrap will be removed following the proposed works.
- Two artificial roosting brick structures (such as the Brick Roost 1GS) will be erected onto the side of the bridge to provide additional roosting habitat for bats, following best practice guidelines (Kelleher & Marnell 2006, NRA 2006). Bat boxes will have a southerly orientation and be positioned at least 3m from the ground, away from artificial lighting. Final bat box locations will be agreed by the project ecologist.
- All scaffolding to be erected for extended periods of time during the construction phase will not obstruct commuting/foraging corridors or sever these corridors from the roost location.
- Scaffolding used will not wrapped or panelled to allow bats to commute freely in between the poles of the scaffolding.
- A derogation license has been granted from the NPWS in advance of the works. The derogation license will be valid for the construction phase and all works will adhere to all measures stipulated in the derogation license.
- No works will be undertaken outside of daylight hours.

- All vegetation removal, repointing and steam cleaning works undertaken below the arch with the known roost will be undertaken by hand.
- With regard to potential noise disturbance to bat species during construction of the Proposed Works, mitigations set out in Section 3.2 will apply to ensure there is no potential for significant effect.
- A pre-commencement survey for otter will be carried out prior to any works commencing. Should an otter holt be recorded within 150m of the proposed works, a derogation license will be obtained from NPWS and works carried out in accordance with NRA (2006) Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes. The otter survey will be carried out no more than 10 months in advance of construction works commencing.

### 3.5.2 Bird Protection Measures

The following mitigation measures in relation to birds will be implemented at the site during the construction phase:

- A pre-commencement survey will be undertaken to determine if any nesting birds have occupied the bridge structure prior to the commencement of any works.
- No works will be undertaken within 2m of any nest until any young have fledged and the nest is unoccupied.
- At least two bird boxes will be erected at the side of the bridge structure to allow for additional bird nesting habitat.
- Ledges on the bridge structure which may provide suitable nesting habitat for local bird species will be retained.
- With regard to potential noise disturbance to local bird species as a result of the construction phase of the Proposed Works, mitigations set out in Section 3.2 will apply to ensure there is no potential for significant effect.
- With regard to potential impacts to waterbirds as a result of deterioration in water quality during construction of the Proposed Works, mitigations set out in Section 3.1 will apply to ensure there is no potential for significant effect.

## Map Legend

- Extent of Proposed De-watered Area
- Construtsion Site Compound
- Solid Fencing
- Nursery habitat fencing (ECoW)
- Suitable Nursery Habitat

N



Drawing Title

Mitigations Map

Project Title

Markievicz Bridge Scour Repairs

| Drawn By | Checked By |
|---|---|
| EF | PR |
| Project No. | Drawing No. |
| 220943 | Figure 3-1 |
| Scale | Date |
| 1:625 | 27/03/2025 |

MKO

Planning and Environmental Consultants

Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email:info@mkoireland.ie
Website: ww.mkoireland.ie

## 3.6 Invasive Species Management

During the river habitat assessment carried out on the 13th of March 2025, The Third Schedule (European Communities (Birds and Natural Habitats) Regulations (S.I. 477 of 2011)) species Zebra mussel (Dreissena polymorpha) was recorded within the Proposed Works area in the Garavogue River.

Given that instream works are required as part of the Proposed Works, there is a risk of introduction of invasive species, including invasive plants and invasive fauna (e.g. molluscs) or disease (e.g. crayfish plague) to the aquatic environment via machinery, equipment or clothing. The following protocols will be adhered to at all stages of the construction of the Proposed Works:

- Ensure staff are fully aware of this protocol before commencement of works
- Instream works are to be carried out in line with Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters as well as IFI (2010) Biosecurity Protocol for Field Survey Work as well as IW-AO-SOP-010 Biosecurity Standard Operating Procedure for Aquatic Sampling.
- All plant and equipment to be cleaned thoroughly and disinfected with 1% Virkon solution or other proprietary disinfectant before entering the water, including all machinery, pumps, hand tools, ropes, etc.
- All plant and equipment and clothing to be brushed down and disinfected with 1% Virkon solution or other proprietary disinfectant.
- Any imported materials must be certified free of invasive species. All imported materials will be fully cleaned down using 1% Virkon solution or other proprietary disinfectant
- Machinery will be cleaned using high-pressure steam cleaning, with water > 40 degrees Celsius.
- Disinfectant to be applied to the undercarriage and wheels of the vehicle and trailer after steam cleaning.
- Footwear will be dipped in or scrubbed with a disinfectant solution (1% solution of Virkon Aquatic or another proprietary disinfection product) and thoroughly dried afterwards.
- All PPE will be visually inspected, and any attached vegetation or debris removed.
- The above cleaning and disinfection procedures will be carried out on all plant, machinery, equipment and clothing before entering the instream works area and after leaving the instream works area before working on a different site.
- Any necessary importation of materials into the dry working area will be certified clean material free of invasive species.

## 3.7 Construction Waste Management Plan

This section of the CEMP provides a Waste Management Plan (WMP) which outlines the best practice procedures during the construction phase of the project. This plan has been compiled based on The Department of the Environment document entitled, '*Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects' (2021).*

The plan is based on the European waste hierarchy which sets out the most to least preferred options for waste management. Waste prevention and re-use are viewed as the most desirable options for managing wastes with the least desirable option considered being disposal to a licensed landfill.

This plan has a number of key objectives as outlined below:

- To set out management prescriptions that adhere to the waste management hierarchy.
- To outline the roles and responsibilities of the appointed Waste Manager

## 3.7.1 Legislation

The Waste Management Acts 1996 as amended provide for measures to improve performance in relation to waste management, recycling and recovery. The Act also provides a regulatory framework for meeting higher environmental standards set out by other national and EU legislation.

The Act requires that any waste related activity must have all necessary licenses and authorisations. It will be the duty of the Waste Manager on the site of the Proposed Works to ensure that all contractors hired to remove waste from the site have valid Waste Collection Permits. It will then be necessary to ensure that the waste is delivered to a licensed or permitted waste facility. The hired waste contractors and subsequent receiving facilities must adhere to the conditions set out in their respective permits and authorisations.

## 3.7.2 Waste Management Hierarchy

The waste management hierarchy sets out the most efficient way of managing in the following order:

### Prevention and Minimisation:

The primary aim of the WMP will be to prevent and thereby reduce the amount of waste generated at each stage of the project. The prevention and minimisation of waste of this development will be developed by implementing effective on-site materials management in terms of both material acquisition and storage on site.

### Reuse of Waste:

Reusing as much of the waste generated on site as possible will reduce the quantities of waste that will have to be transported off site to recovery facilities or landfill. Site management will be required to encourage the appropriate reuse of materials where possible as well as identify re-use opportunities to achieve ultimate goal of waste reduction.

### Recycling of Waste:

There are a number of established markets available for the beneficial use of construction waste such as using waste concrete as fill for new roads.

At all times during the implementation of the WMP, disposal of waste to landfill will be considered only as a last resort.

## 3.7.3 Construction Waste Management

During the construction phase of the project, waste will be generated primarily from the excavation works. Although a quantity of this material will be used for backfilling and general restoration of excavated areas, it is anticipated that a quantity of this material will require disposal or recovery at an appropriately licensed waste facility.

Waste generated post excavation on site will be managed in the Waste Storage Area (WSA) where the various waste components will be segregated into a number of waste categories in accordance with a general waste segregation policy and placed into individual skips. The categories for segregation will include timber, metal and plastics. This material will be removed by authorised waste collection contractors for recycling and recovery at a licensed facility. The remaining volume of waste material which cannot be allocated to any of these three waste streams will be disposed of in a general waste skip. This waste material will be transferred to a Materials Recovery Facility (MRF) by a fully licensed

waste contractor where the waste will be further sorted into individual waste streams for recycling, recovery or disposal. This general waste will be subject to constant monitoring by site management to ensure that potential reusable and recyclable material is not being disposed of therein. Other waste mitigation measures which will be implemented at the site are as follows;

- All waste will be collected in skips and the site will be kept tidy and free of debris at all times.
- Waste oils and hydraulic fluids will be collected in leak proof containers and removed from the site for disposal or recycling. It is also essential that all empty oil containers and other hazardous wastes be disposed of in accordance with the requirements of the Waste Management Act, 1996 as amended.
- All construction waste materials will be stored within the confines of the construction site compound, prior to removal from the site to an appropriately licensed waste facility.
- No wastewater will be discharged on-site during the construction phase.

The expected wastes arising from the works including the individual European List of Waste (LoW) codes are outlined in Table 3-1.

*Table 3-1 Expected waste types arising from the Construction Phase*

| Materials | Example | LoW Code |
|---|---|---|
| Concrete | Post-cast pier components | 17 01 01 |
| Mixture of inert material | Sand, stones, brick, rock | 17 01 07 |
| Plastic | Packaging | 17 02 03 |
| Soil & Stones | Overburden, soil, subsoil | 17 05 04 |
| Canteen Waste | Miscellaneous waste from site staff | 20 01 08 |

It is also essential that all waste oils, empty oil containers and other hazardous wastes be disposed of in accordance with the requirements of the Waste Management act, 1996.

### 3.7.3.1 Waste Arisings and Proposals for Minimisation, Reuse and Recycling of Construction Waste

Construction waste will arise on the site mainly from unavoidable construction waste including material surpluses and damaged materials and packaging waste.

Appropriate measures will be taken to ensure excess waste is not generated during construction, including;

- Ordering of materials will be on an 'as needed' basis to prevent over supply to site. Co-ordination is required with suppliers enabling them to take/buy back surplus stock.
- Purchase of materials pre-cut to length to avoid excess scrap waste generated on site.
- Request that suppliers use least amount of packaging possible on materials delivered to the site.
- Ensuring correct storage and handling of goods to avoid unnecessary damage that would result in their disposal.
- Ensuring correct sequencing of operations.

- Use reclaimed materials in the construction works.

Hazardous waste will be kept separate from all other construction waste to prevent contamination and removed appropriately.

#### 3.7.3.2 Wastes Arising from Construction Activities

All waste generated on site will be contained in waste skips at a waste storage area on site. This waste storage area will be kept tidy with skips clearly labelled to indicate the allowable material to be disposed of therein.

Any packaging waste generated from the delivery of materials will be deposited into the on-site skips and subsequently transferred to the MRF.

Site personnel will be instructed at induction that under no circumstances can waste be brought to site for disposal in the on-site waste skip. It will also be made clear that the burning of waste material on site is forbidden.

## 3.7.4 Implementation

### 3.7.4.1 Roles and Responsibilities for Waste Management

Prior to the commencement of the Proposed Works, a Waste Manager will be appointed by the project team. The role of Waste Manager is likely to be fulfilled by the Site Manager given the scale of the development. The Waste Manager will be responsible for the implementation of the objectives of this plan, ensuring that all hired waste contractors have the necessary authorisations and that the waste management hierarchy is adhered to. The person nominated must have sufficient authority so that they can ensure everyone working on the Proposed Works adheres to the management plan. The waste manager will also be required to conduct regular waste audits in the WSA and throughout the site to ensure that the waste management plan is operating effectively.

### 3.7.4.2 Training

It is important for the Waste Manager to communicate effectively with colleagues in relation to the aims and objectives of the waste management plan. All employees working on site during the construction phase of the project will be trained in materials management and thereby, should be able to:

- Distinguish reusable materials from those suitable for recycling.
- Ensure maximum segregation at source.
- Co-operate with site manager on the best locations for stockpiling reusable materials.
- Separate materials for recovery.
- Identify and liaise with waste contractors and waste facility operators.

### 3.7.4.3 Record Keeping

The WMP will provide systems that will enable all arisings, movements and treatments of waste to be recorded. This system will enable the contractor to measure and record the quantity of waste being generated. It will highlight the areas from which most waste occurs and allows the measurement of arisings against performance targets. The WMP can then be adapted with changes that are seen through record keeping.

The fully licensed waste contractor employed to remove waste from the site, will be required to provide documented records for all waste dispatches leaving the site. Each record will contain the following:

- Consignment Reference Number
- Material Type(s) and List of Waste (LOW) Code(s)
- Company Name and Address of Site of Origin
- Trade Name and Collection Permit Ref. of Waste Carrier
- Trade Name and Licence Ref. of Destination Facility
- Date and Time of Waste Dispatch
- Registration no. of waste transport vehicle
- Weight of Material
- Signature of Confirmation of Dispatch detail
- Date and Time of Waste Arrival at Destination
- Site Address of Destination Facility

### 3.7.5 Waste Management Plan Conclusion

The WMP will be correctly implemented and adhered to by all staff involved in the project which will be outlined within the induction process for all site personnel. The waste hierarchy will always be employed to ensure that the least possible amount of waste is produced during the construction phase. Reuse of certain types of construction wastes will cut down on the cost and requirement of raw materials therefore further minimising waste levels.

# 4. ENVIRONMENTAL MANAGEMENT IMPLEMENTATION AND EMERGENCY RESPONSE

## 4.1 Construction Manager/Site Manager

The Site Manager will have overall responsibility for the organisation and execution of all related environmental activities as appropriate, in accordance with regulatory and project environmental requirements. The duties and responsibilities of the Site Supervisor will include:

- Ensure that all works are completed safely and with minimal environmental risk;
- Approve and implement the CEMP and supporting environmental documentation, and ensure that all environmental standards are achieved during the construction phase of the project;
- Take advice from the Ecological Clerk of Works (ECoW) on legislation, mitigation measures, codes of practice, guidance notes and good environmental working practice relevant to their work;
- Ensure compliance through audits and management site visits;
- Ensure timely notification of environmental incidents; and,
- Ensure that all construction activities are planned and performed such that minimal risk to the environment is introduced;
- Provide full and adequate supervision and site administration during the progress of the works;

## 4.2 Ecological Clerk of Works

The main contractor appointed to carry out the works on site will be required to provide a dedicated person to carry out supervision on site in the form of an Ecological Clerk of Works (EcOW). In general, this ECoW will maintain responsibility for monitoring the works and Contractors/Sub-contractors from an environmental perspective and ensuring that all mitigation measures outlined in this CEMP are implemented at the site. The ECoW will act as the regulatory interface on environmental matters by reporting directly to the client and liaising with Sligo County Council and other statutory bodies as required. The duties of the appointed ECoW are summarised as follows:

- Maintain and update as required the Construction Phase CEMP and supporting environmental documentation and review/approval of contractor method statements.
- Undertake inspections and reviews to ensure the works are carried out in compliance with the CEMP.
- Monitor the implementation of the CEMP, particularly all proposed/required Environmental monitoring and mitigation.
- Advise site management/contractor/sub-contractors on:
    - Prevention of environmental pollution and improvement to existing working methods.
    - Changes in legislation and legal requirements affecting the environment.
    - Suitability and use of plant, equipment and materials to prevent pollution.
    - Environmentally sound methods of working and systems to identify environmental hazards.
- Ensure proper mitigation measures are initiated and adhered to during the construction phase.
- Ensure adequate arrangements are in place for site personnel to identify potential environmental incidents.

- Ensure that details of environmental incidents are communicated in a timely manner to the relevant regulatory authorities, initially by phone and followed up as soon as is practicable by email.
- Support the investigation of incidents of significant, potential or actual environmental damage, and ensure corrective actions are carried out, recommend means to prevent recurrence and communicate incident findings to relevant parties.
- The ECoW will initially be present on a daily basis until the site is set up and construction is underway.
- The frequency and extent of the site supervision will be up to the ECoW, which will depend on the functioning of all listed mitigation measures in the NIS and EcIA, and how well they are adhered to by contractors on site.
- The ECoW will make regular visits to the site throughout the construction phase of the Proposed Works, and details of the functionality and adherence to mitigation measures will be recorded during each visit.
- It will be the responsibility of the ECoW to ensure that the biosecurity measures outlined in Section 3.6 of this CEMP are in place.
- All site visit reports, and documentation will be collated into a final report which will be sent to Sligo County Council for review to ensure compliance with the mitigation measures outlined in the NIS and EcIA.
- The ECoW will have the authority to stop all of the works on site if the ECoW has reasonable doubt that the prescribed mitigation measures are not being adhered to properly.
- The ECoW will be present for all works taking place upstream of the bridge, in areas identified as providing suitable spawning habitat.
- Once the dry working area has been established, the ECoW will be responsible for making out the area of suitable nursery habitat in the south right hand bank (RHB) downstream of the bridge, as shown in Figure 3-1.
- The ECoW will ensure that all machinery and personnel do not enter this area at any stage during the construction phase.

## 4.3 Emergency Response Plan

### 4.3.1 Emergency Response

The Emergency Response Plan (ERP) is presented in this section of the CEMP. It provides details of procedures to be adopted in the event of an emergency in terms of site health and safety and environmental protection. The site ERP includes details on the response required and the responsibilities of all personnel in the event of an emergency. The ERP will require updating and submissions from the contractor and suppliers as the proposed project progresses. Where sub-contractors that are contracted on site are governed by their own emergency response procedure a bridging arrangement will be adopted to allow for inclusion of the sub-contractor's ERP within this document.

This is a working document that requires updating throughout the various stages of the project.

### 4.3.2 Roles and Responsibilities

The chain of command during an emergency response sets out who is responsible for coordinating the response. The Site Manager will lead the emergency response which makes him responsible for activating and coordinating the emergency response procedure. The other site personnel who can be identified at this time who will be delegated responsibilities during the emergency response are presented in Figure 4-1. In a situation where the Site Manager is unavailable or incapable of coordinating the emergency response, the responsibility will be transferred to the next person in the

chain of command outlined in Figure 4-1. This will be updated throughout the various stages of the project.

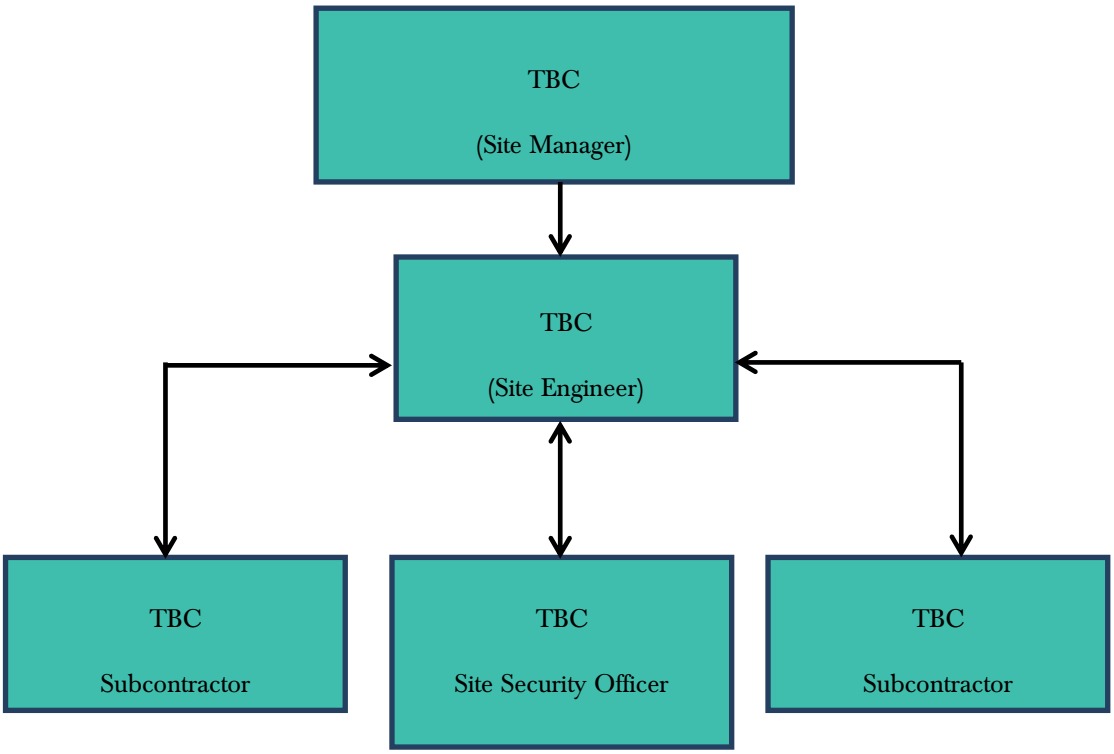



*Figure 4-1 Emergency Response Procedure Chain of Command.*

### 4.3.3 Initial Steps

In order to establish the type and scale of potential emergencies that may occur, the following hazards have been identified as being potential situations that may require an emergency response in the event of an occurrence.

*Table 4-1 Hazard Associated with Potential Emergency Situations*

| Hazard | Emergency Situation |
|---|---|
| Construction Vehicles: Dump trucks, tractors, excavators, cranes etc. | Collision or overturn which has resulted in operator or third-party injury. |
| Abrasive wheels/Portable Tools. | Entanglement, amputation or electrical shock associated with portable tools. |
| Contact with services. | Electrical shock or gas leak associated with an accidental breach of underground services. |
| Fire | Injury to operative through exposure to fire. |
| Falls from heights including falls from scaffold towers, scissor lifts, ladders and roofs. | Injury to operative after a fall from a height. |
| Sickness | Illness unrelated to site activities of an operative e.g., heart attack, loss of consciousness, seizure. |

In the event of an emergency situation associated with, but not restricted to, the hazards outlined in Table 4-1 the Site Manager will carry out the following:

- Establish the scale of the emergency situation and identify the number of personnel, if any, have been injured or are at risk of injury.
- Where necessary, sound the emergency siren/foghorn that activates an emergency evacuation on the site.
- Make safe the area if possible and ensure that there no identifiable risk exists with regard to dealing with the situation e.g., if a machine has turned over, ensure that it is in a safe position so as not to endanger others before assisting the injured.
- Contact the required emergency services or delegate the task to someone if he is unable to do so. If delegating the task, ensure that they follow the procedures for contacting the emergency services as set out in Section 4.3.6.
- Take any further steps that are deemed necessary to make safe or contain the emergency incident e.g., cordon off an area where an incident associated with electrical issues has occurred.
- Contact any regulatory body or service provider as required e.g., ESB Networks the numbers for which as provided in Section 4.3.6.
- Contact the next of kin of any injured personnel where appropriate. The procedure for this is outlined in Section 4.3.6.

### 4.3.4 Site Evacuation/Fire Drill

A site evacuation/fire drill procedure will provide basis for carrying out the immediate evacuation of all site personnel in the event of an emergency. The following steps will be taken:

- A Site Security Officer will be appointed by the Site Manager.
- Notification of the emergency situation. Provision of a siren or foghorn to notify all personnel of an emergency situation.
- An assembly point will be designated in the construction compound area and will be marked with a sign. All site personnel will assemble at this point.
- A roll call will be carried out by the Site Security Officer to account for all personnel on site.
- The Site Security Officer will inform the Site Manager when all personnel have been accounted for. At this time the Site Manager will decide the next course of action which will be determined by the situation that exists at that time. The Site Manager will advise all personnel accordingly.

All personnel will be made aware of the evacuation procedure during site induction. The Fire Services Acts of 1981 and 2003 require the holding of fire safety evacuation drills at specified intervals and the keeping of records of such drills.

### 4.3.5 Environmental Emergency Response Procedure

#### 4.3.5.1 Spill Control Measures

Every effort will be made to prevent an environmental incident during the construction phase of the Proposed Project. Oil/Fuel spillages are one of the main environmental risks that will exist on the Proposed Site which will require an emergency response procedure. The importance of a swift and effective response in the event of such an incident occurring cannot be over emphasised. The following steps provide the procedure to be followed in the event of such an incident.

- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.
- If applicable, eliminate any sources of ignition in the immediate vicinity of the incident.
- Contain the spill using the spill control materials, track mats or other material as required. Do not spread or flush away the spill.
- If possible, cover or bund off any vulnerable areas where appropriate such as drains, watercourses or sensitive habitats.
- If possible, clean up as much as possible using the spill control materials.
- Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited.
- Notify the ECoW immediately giving information on the location, type and extent of the spill so that they can take appropriate action.
- The ECoW will inspect the site and will assist by providing any advice possible to ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring.
- The EcOW will notify the appropriate regulatory body such as Sligo County Council and Environmental Protection Agency (EPA) etc. if deemed necessary.

Environmental incidents are not limited to just fuel spillages. Therefore, any environmental incident must be investigated in accordance with the following steps.

- The EcOW must be immediately notified.

- If necessary, the ECoW will inform the appropriate regulatory authority. The appropriate regulatory authority will depend on the nature of the incident.
- The details of the incident will be recorded on an Environmental Incident Form which will provide information such as the cause, extent, actions and remedial measures that were used following the incident. The form will also include any recommendations made to avoid reoccurrence of the incident.
- A record of all environmental incidents will be kept on file by the ECoW and the Site Manager. These records will be made available to the relevant authorities such as Sligo County Council and the EPA if required.

The EcOW will be responsible for any corrective actions required as a result of the incident e.g., an investigative report, formulation of alternative construction methods or environmental sampling, and will advise the Site Manager as appropriate.

## 4.3.6 Contacting the Emergency Services

### 4.3.6.1 Emergency Communication Procedure

In the event of requiring the assistance of the emergency services the following steps should be taken:

- Stay calm. It is important to take a deep breath and not get excited. Any situation that requires 999/112 is, by definition, an emergency. The dispatcher or call-taker knows that and will try to move things along quickly, but under control.
- Know the location of the emergency and the number you are calling from. This may be asked and answered a couple of times but do not get frustrated. Even though many emergencies call centres have enhanced capabilities meaning they are able to see your location on the computer screen they are still required to confirm the information. If for some reason you are disconnected, at least emergency crews will know where to go and how to call you back.
- Wait for the call-taker to ask questions, then answer clearly and calmly. If you are in danger of assault, the dispatcher or call-taker will still need you to answer quietly, mostly "yes" and "no" questions.
- If you reach a recording, listen to what it says. If the recording says your call cannot be completed, hang up and try again. If the recording says all call takers are busy, WAIT. When the next call-taker or dispatcher is available to take the call, it will transfer you.
- Let the call-taker guide the conversation. He or she is typing the information into a computer and may seem to be taking forever. There is a good chance, however, that emergency services are already being sent while you are still on the line.
- Follow all directions. In some cases, the call-taker will give you directions. Listen carefully, follow each step exactly, and ask for clarification if you do not understand.
- Keep your eyes open. You may be asked to describe victims, suspects, vehicles, or other parts of the scene.
- Do not hang up the call until directed to do so by the call taker.

All staff members will know the address and location of the site as it may be necessary to liaise with the emergency services on the ground in terms of locating the site. This may involve providing an escort from a designated meeting point that may be located more easily by the emergency services.

### 4.3.6.2 Contact Details

A list of emergency contacts is presented in Table 4-2.

*Table 4-2 Emergency Contacts*

| Hazard | Emergency Situation |
|---|---|
| Emergency Services – Ambulance, Fire, Gardaí | 999/112 |
| Doctor – Sligo Medical | 071-915 1288 |
| Hospital – Sligo University Hospital | 071-917 1111 |
| ESB Emergency Services | 1850 372 999 |
| Bórd Gais Emergency | 1850 20 50 50 |
| Gardaí – Sligo Garda Station | 071-915 7000 |
| Health and Safety Coordinator - Health & Safety Services | TBC |
| Health and Safety Authority | 1890 289 389 |
| Project Supervisor Construction Stage (PSCS): TBC | TBC |
| Project Supervisor Design Stage (PSDS): TBC | TBC |

#### 4.3.6.3 Procedure for Personnel Tracking

All operatives on site without any exception will have to undergo a site induction where they will be required to provide personal contact details which will include contact information for the next of kin.

In the event of a site operative becoming involved in an emergency situation where serious injury has occurred, and hospitalisation has taken place, it will be the responsibility of the Site Manager or next in command if unavailable to contact the next of kin to inform them of the situation that exists.

#### 4.3.6.4 Induction Checklist

Table 4-3 provides a list of items highlighted in this ERP which must be included or obtained during the mandatory site induction of all personnel that will work on the site. This will be updated throughout the various stages of the project.

*Table 4-3 Emergency Response Plan Items Applicable to the Site Induction Process*

| ERP Items to be included in Site Induction | Status |
|---|---|
| All personnel will be made aware of the evacuation procedure during site induction. | |
| Due to the location of the site, it may be necessary to liaise with and assist the emergency services on the ground in terms of locating the site. This may involve providing an escort from a designated meeting point that may be located more easily by the emergency services. This should form part of the site induction | |

| | |
|---|---|
| to make new personnel and sub-contractors aware of any such arrangement or requirement if applicable. | |
| All operatives on site without any exception will undergo a site induction where they will be required to provide personal contact details which will include contact information for the next of kin. | |

# 5. MITIGATION PROPOSALS

The Mitigation Measures which will be implemented are presented in this section of the CEMP. The CEMP will be finalised subsequent to any permission granted by Sligo County Council and will be updated prior to construction to include, inter alia, any additional requirements pursuant to relevant planning conditions imposed.

By presenting the mitigation proposals in the below format, it is intended to provide an easy to audit list that can be reviewed and reported on during the future phases of the project.

*Table 5-1 Mitigation Measures for Pre-commencement and Construction Phases*

| Mitigation Measure | Reference Location | Mitigation Measure | Audit Result | Action Required |
|---|---|---|---|---|
| **Pre-Commencement Phase** | | | | |
| 1 | CEMP Section 1 | All measures identified in this CEMP, which will be finalised subsequent to any permission granted and updated prior to construction, will include all mitigation measures identified to be adhered to during the pre-commencement and construction phases of the Proposed Works. | | |
| **Construction Phase** | | | | |
| **Prevention Pollution Control Measures** | | | | |
| 2 | CEMP Section 3.1.1 | › No works will take place during periods of high rainfall to reduce run-off, potential siltation of watercourses and potential inundation of the dry working area. 'High rainfall' is defined as follows:<br>› Rainfall >10 mm/hr (i.e. high intensity localised rainfall event)<br>› Rainfall >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day) or,<br>› Rainfall total greater than monthly average recorded in 7 consecutive days (prolonged heavy rainfall over a week).<br>› All works will be undertaken during dry weather periods (see definition above) and when river levels are low.<br>› The appointed contactor will be fully briefed by an ecologist as to the sensitive nature of the site and the required mitigation measures.<br>› The construction compound area will be surrounded with a solid fencing to prevent surface water run off to the river.<br>› Rewetting of the dry working area will only take place once all concrete has been allowed to cure for the appropriate time period. | | |

| Mitigation Measure | Reference Location | Mitigation Measure | Audit Result | Action Required |
|---|---|---|---|---|
| | | › Stockpiling of materials will be carried out temporarily within the dry working area and periodically removed throughout the works. No stockpiled materials will be left within the dry working area overnight.<br>› Temporary stockpiling will take place within the materials storage area, the location of which is shown in the Temporary Traffic Management and Site Set-up Drawing in Appendix A to this CEMP. | | |
| | | **Instream Works** | | |
| 3 | CEMP Section 3.1.2 | › All construction methods will adhere to Inland Fisheries Ireland (2016) *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters;*<br>› No works will be undertaken during Spring Tides. All materials and machinery will be removed from the site prior to any Spring Tides or during periods of heavy rainfall.<br>› Prior to the commencement of works, Inland Fisheries Ireland (IFI) will be notified, and no instream works shall be carried out during the closed season for instream works (October 1st to June 30th). Any works associated with the Proposed Works will only be carried out during the fisheries open season which is from 1st July to 30th of September each year;<br>› No instream works will be carried out outside of dry working area<br>› The dry working area will be fully sealed using 1-Tonne bags filled with clean inert sand to avoid any water ingress. Smaller sandbags will also be used to fully seal the inside of the dewatering area from excessive water ingress, and to weigh down the impermeable plastic membrane.<br>› The working area will be electro-fished by qualified personnel in advance of dewatering the works area. | | |
| | | **De-watering** | | |

| Mitigation Measure | Reference Location | Mitigation Measure | Audit Result | Action Required |
|---|---|---|---|---|
| 4 | CEMP Section 3.1.3 | › A pump will be located within the construction compound at street level. Dewatering of the dry working area will be carried out by pumping the water out of the sump in the bunded, dry working area, through the pump system located within the construction compound, which will be fitted with a silt buster. The silt bag or silt buster will allow the water to flow through the geotextile fabric and will trap any of the finer silt and sediment remaining in the water<br>› A silt curtain will be established downstream of the dry working area, attached to the bankside.<br>› The mouth of the return pipe will sit above the water level to prevent the pipe from being submerged under water.<br>› The pumped water from the dry working area will be pumped through the silt buster into the area confined by the silt curtain within the Garavogue River.<br>› Automated turbidity metres will be installed upstream and downstream of the Proposed Works area for suspended solids, and these will be monitored regularly by a suitably qualified ecologist. If there is a 20% difference between the downstream reading and the upstream reading, then all works will be halted until the source of the problem is rectified.<br>› Bio-security measures such a washing of vehicles, plant and equipment prior to mobilisation and de-mobilisation will be adhered to as detailed in the biosecurity measures in Section 3.6 below<br>› Rewetting of the dry working area will only take place once all concrete is completely cured. | | |
| **Refuelling, Fuel and Hazardous Materials Storage** | | | | |
| 5 | CEMP Section 3.1.4 | › Lubricants and hydraulic fluids for equipment used on the site will be carefully handled to avoid spillage and provided with spill containment. | | |

| Mitigation Measure | Reference Location | Mitigation Measure | Audit Result | Action Required |
|---|---|---|---|---|
| | | › All site plant will be inspected at the beginning of each day prior to use. Defective plant shall not be used until the defect is satisfactorily fixed. All major repair and maintenance operations will take place off site.<br>› No vehicles or machinery which use hydrocarbons will be used within the dry working area on the riverbed. The only machinery required to be used within the dry working area will be an electric 1.5 tonne mini digger which will be lowered into the dry working area using a mobile crane.<br>› Outside of working hours, plant machinery will be parked within the dedicated vehicle parking area in the construction compound, at a minimum distance of 10m from the watercourse.<br>› No tools or potentially toxic materials will be stored or left within the dry working area overnight or when there is danger of the dry working area being inundated with water.<br>› The storage of oils, fuel, chemicals, hydraulic fluids, etc. will be undertaken in accordance with current best practice for oil storage (BPGCS005, Enterprise Ireland) on an impervious base within a bund and appropriately secured;<br>› Any fuel storage required will be stored at street level, outside of the in-stream works, within a dedicated materials storage area at street level which is shown the Temporary Traffic Management and Site Set-up Drawing in Appendix A to this CEMP.<br>› All machinery operating on-site will be steam-cleaned in advance of works as set out in Section 3.6 of this CEMP and routinely checked to ensure no leakage of oils or lubricants occurs;<br>› Potential impacts caused by any spillage of fuels, lubricants or hydraulic oils will be reduced by keeping spill kits at locations within the construction site compound at street level, and accidental spills will be immediately contained, and the contaminated soil removed from the area and properly disposed of;<br>› Oil booms and oil soakage pads will be kept at the construction compound and fuel storage area to deal with any accidental spillage; | | |

| Mitigation Measure | Reference Location | Mitigation Measure | Audit Result | Action Required |
|---|---|---|---|---|
| | | › All fuels, lubricants and hydraulic fluids shall be kept in secure bunded units at the dedicated storage area. The bunded area shall accommodate 110% of the total capacity of the containers within it.<br>› Containers shall be properly secured to prevent unauthorised access and misuse. An effective spillage procedure shall be put in place with all staff properly briefed. Any waste oils or hydraulic fluids shall be put in place with all staff properly briefed. Any waste oils or hydraulic fluids shall be collected, stored in appropriate containers and disposed of offsite in an appropriate manner;<br>› No refuelling will take place within the construction compound. Refuelling will only take place at a dedicated refuelling facility.<br>› Spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment;<br>› All plant and machinery shall be regularly maintained and serviced to minimise release of hydrocarbons.<br>› Contractors will establish dedicated secure areas at the construction compound for the storage of fuel and chemicals in mobile bowsers.<br>› The pump located within the construction compound will be bunded. | | |
| **Dust Control** | | | | |
| 6 | CEMP Section 3.1.5 | › The public roads will be regularly inspected by Site Management for cleanliness and cleaned as necessary.<br>› Material handling systems and material storage areas, if required will be designed and laid out to minimise exposure to wind.<br>› Transport of aggregates or other material, which has the potential to generate dust, will be undertaken in tarpaulin-covered vehicles where necessary.<br>› Daily inspection of construction site to examine dust measures and their effectiveness. | | |

| Mitigation Measure | Reference Location | Mitigation Measure | Audit Result | Action Required |
|---|---|---|---|---|
| | | **Cement-based Products** | | |
| 7 | CEMP Section 3.1.6 | › All concrete will be transferred to the dry working area by chute from the construction site compound into a fully sealed, bunded container.<br>› All concrete placing will be conducted under controlled conditions to prevent any potential runoff to the river;<br>› All formworks will be adequately constructed and sealed to prevent leakage or spillage and will have sufficient capacity to support all poured concrete;<br>› Regular pH checks will be carried out on any pumped water from the dry working area during cement works.<br>› No batching of wet concrete will occur within the dry working area.<br>› Only ready-mixed, self-compacting wet concrete products and pre-cast concrete will be used within the dry working area for the scour repairs on the bridge piers. No mixing of wet concrete will occur within the riverbed at any time.<br>› Raw or uncured waste concrete shall be removed from the site for appropriate disposal or reuse;<br>› Concrete trucks will be directed back to their batching plant for washout;<br>› Clearly visible signs shall be placed in prominent locations close to concrete pour areas, stating that washout of concrete lorries is not permitted on the site; and,<br>› Concrete pour sites shall be free of standing water to mitigate the risk of run-off being polluted with cementitious material.<br>› Concrete pours shall be avoided where prolonged periods of heavy rain are forecast, and covers shall be available and used for freshly placed concrete to avoid the surface washing away in heavy rain. | | |
| | | **Noise Control** | | |

| Mitigation Measure | Reference Location | Mitigation Measure | Audit Result | Action Required |
|---|---|---|---|---|
| 8 | CEMP Section 3.2 | › Construction equipment for use outdoors shall comply with the European Communities Regulations– Noise Emission by Equipment for Use Outdoors – SI 241 - 2006.<br>› If utilised, diesel generators will be enclosed in sound proofed containers to minimise the potential for noise impacts.<br>› Any construction plant and equipment to be used on-site will be modern equipment and will comply with the "European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1996".<br>› Plant with the potential of generating noise or vibration will be placed as far away from sensitive properties as permitted by site constraints.<br>› Regular maintenance of plant will be carried out in order to minimise noise emissions. Particular attention will be paid to the lubrication of bearings and the integrity of silencers.<br>› All plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the works.<br>› If compressors are required, they will be of the "sound reduced" models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.<br>› Machines such as cranes and pumps, which are used intermittently, will be shut down during those periods when they are not in use.<br>› Training will be provided by the Site Management to drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation. | | |
| **Vibration Control** | | | | |
| 9 | CEMP Section 3.3 | › The hours of working should be planned, and account should be taken of the effects of vibration upon persons in areas surrounding site operations and | | |

| Mitigation Measure | Reference Location | Mitigation Measure | Audit Result | Action Required |
|---|---|---|---|---|
| | | upon persons working on site, considering the nature of land use in the areas concerned and the duration of work.<br>› Where reasonably practicable, low vibration working methods should be employed. Consideration should be given to use of the most suitable plant, reasonable hours of working for operations which might give rise to perceptible vibrations, and economy and speed of operations.<br>› Vibration should be controlled at source and the spread of vibration should be limited.<br>› Where reasonably practicable, plant and/or methods of work causing significant levels of vibration at sensitive premises should be replaced by other less intrusive plant and/or methods of working.<br>› Vibration from stationary plant (e.g. generators and pumps) can, in some instances, prove disturbing when located close to sensitive premises or when operating on connected structures. In these instances, equipment should be relocated or isolated using resilient mountings.<br>› Best practice vibration control measures will be employed by the contractor. | | |
| | | **Traffic Management Proposals** | | |
| 10 | CEMP Section 3.5 | › Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction works locations.<br>› Construction and delivery vehicles will be instructed to use only the approved and agreed means of access; and movement of construction vehicles will be restricted to these designated routes.<br>› Access routes will be clearly marked / identified. Access during construction to any working areas will be restricted to land within the outlined works area<br>› Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on HGVs carrying dust producing material. | | |

| Mitigation Measure | Reference Location | Mitigation Measure | Audit Result | Action Required |
|---|---|---|---|---|
| | | › Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds.<br>› Parking of site vehicles will be managed and will not be permitted on public road, unless proposed within a designated area that is subject to traffic management measures and agreed with Sligo County Council.<br>› Deliveries of construction materials will be planned to ensure that the materials are delivered only as they are required and will avoid peak hours when possible.<br>› All vehicles will be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol or diesel. All scheduled maintenance will not be carried out on the public highway. | | |
| **General Ecological Mitigation Measures** | | | | |
| 11 | CEMP Section 3.5 | › An electric 1.5 tonne mini digger will be the only machinery permitted within the dry working area.<br>› No works will take place during the spawning season for lamprey and salmonid species (May to June).<br>› Instream works will only be carried out during the fisheries open season which is from 1st July to 30th of September each year;<br>› No works will take place during the spawning season for lamprey (May to June) and salmonid (November to March)<br>› Instream works will be carried out in consultation with Inland Fisheries Ireland (IFI) and in line with IFI (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters;<br>› The translocation individuals will be relocated to a suitable similar river habitat location within the same grid reference.<br>› Any material removed from the riverbed will be checked by a suitably trained Ecologist under a Section 14 licence via manual hand search for any aquatic | | |

| Mitigation Measure | Reference Location | Mitigation Measure | Audit Result | Action Required |
|---|---|---|---|---|
| | | fauna including lamprey and European eel. These species are known to rise to the surface of excavated material for easy recovery by net.<br>› A second check for aquatic fauna will be carried out once the material has been offloaded into the final disposal area in order to ensure a thorough search through the excavated silt.<br>› On a precautionary basis, if White Clawed Crayfish are found within the working area, these will be safely translocated in a similar manner under licence.<br>› The dry working area required for the in-stream works will only span half of the width of the river at any given time. The river will be left to flow through the remaining half of the river.<br>› The finished river level will not change from the existing levels.<br>› Following the completion of the construction phase, all materials remaining within the dry working area and all bunding materials (i.e. sandbags and plastic membranes) will be removed from the river. No materials shall be left within the river when the dry working area is rewet. | | |
| | | **Bat Protection Measures** | | |
| 12 | CEMP Section 3.5.1 | › A pre-commencement survey and inspection beneath the bridge arches will be undertaken to ensure that the known location of the existing roost is clearly identified, and to ascertain whether any additional crevices in the bridge have been occupied by bats. The requirement for a pre-commencement survey does not represent a lacuna in the survey assessment but is fully in line with industry best practice.<br>› A qualified ecologist will inspect the vegetation to be removed prior to works to ensure that no bats are roosting within, and to identify any potential crevices suitable to roosting bats beneath the bridge arches. Ivy will only be removed by hand or using hand tools.<br>› An ECoW will be present for all works beneath the arch with the known roost. | | |

| Mitigation Measure | Reference Location | Mitigation Measure | Audit Result | Action Required |
|---|---|---|---|---|
| | | › The known roost location will be clearly marked out with tape or chalk.<br>› All staff will be made aware of the location of the roost and the mitigation measures.<br>› No steam cleaning or repointing works will be permitted within 2m of the roost location.<br>› All holes within the bridge structure not used by bats will be temporarily filled with bubble wrap to prevent bats from occupying these locations for the duration of the construction phase. The bubble wrap will be removed following the proposed works.<br>› Two artificial roosting brick structures (such as the Brick Roost 1GS) will be erected onto the side of the bridge to provide additional roosting habitat for bats, following best practice guidelines (Kelleher & Marnell 2006, NRA 2006). Bat boxes will have a southerly orientation and be positioned at least 3m from the ground, away from artificial lighting. Final bat box locations will be agreed by the project ecologist.<br>› All scaffolding to be erected for extended periods of time during the construction phase will not obstruct commuting/foraging corridors or sever these corridors from the roost location.<br>› Scaffolding used will not wrapped or panelled to allow bats to commute freely in between the poles of the scaffolding.<br>› A derogation license has been granted from the NPWS in advance of the works. The derogation license will be valid for the construction phase and all works will adhere to all measures stipulated in the derogation license.<br>› No works will be undertaken outside of daylight hours.<br>› All vegetation removal, repointing and steam cleaning works undertaken below the arch with the known roost will be undertaken by hand.<br>› With regard to potential noise disturbance to bat species during construction of the Proposed Works, mitigations set out in Section 3.2 will apply to ensure there is no potential for significant effect. | | |

| Mitigation Measure | Reference Location | Mitigation Measure | Audit Result | Action Required |
|---|---|---|---|---|
| | | **Bird Protection Measures** | | |
| 13 | CEMP Section 3.5.2 | › A pre-commencement survey will be undertaken to determine if any nesting birds have occupied the bridge structure prior to the commencement of any works.<br>› No works will be undertaken within 2m of any nest until any young have fledged and the nest is unoccupied.<br>› At least two bird boxes will be erected at the side of the bridge structure to allow for additional bird nesting habitat.<br>› Ledges on the bridge structure which may provide suitable nesting habitat for local bird species will be retained.<br>› With regard to potential noise disturbance to local bird species as a result of the construction phase of the Proposed Works, mitigations set out in Section 3.2 will apply to ensure there is no potential for significant effect.<br>› With regard to potential impacts to waterbirds as a result of deterioration in water quality during construction of the Proposed Works, mitigations set out in Section 3.1 will apply to ensure there is no potential for significant effect. | | |
| | | **Invasive Species Management** | | |
| 14 | CEMP Section 3.6 | › Ensure staff are fully aware of this protocol before commencement of works<br>› Instream works are to be carried out in line with Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters as well as IFI (2010) Biosecurity Protocol for Field Survey Work as well as IW-AO-SOP-010 Biosecurity Standard Operating Procedure for Aquatic Sampling.<br>› All plant and equipment to be cleaned thoroughly and disinfected with 1% Virkon solution or other proprietary disinfectant before entering the water, including all machinery, pumps, hand tools, ropes, etc. | | |

| Mitigation Measure | Reference Location | Mitigation Measure | Audit Result | Action Required |
|---|---|---|---|---|
| | | › All plant and equipment and clothing to be brushed down and disinfected with 1% Virkon solution or other proprietary disinfectant.<br>› Any imported materials must be certified free of invasive species. All imported materials will be fully cleaned down using 1% Virkon solution or other proprietary disinfectant<br>› Machinery will be cleaned using high-pressure steam cleaning, with water > 40 degrees Celsius.<br>› Disinfectant to be applied to the undercarriage and wheels of the vehicle and trailer after steam cleaning.<br>› Footwear will be dipped in or scrubbed with a disinfectant solution (1% solution of Virkon Aquatic or another proprietary disinfection product) and thoroughly dried afterwards.<br>› All PPE will be visually inspected, and any attached vegetation or debris removed.<br>› The above cleaning and disinfection procedures will be carried out on all plant, machinery, equipment and clothing before entering the instream works area and after leaving the instream works area before working on a different site.<br>› Any necessary importation of materials into the dry working area will be certified clean material free of invasive species. | | |
| **Construction Waste Management** | | | | |
| 15 | CEMP Section 3.7.3 | › All waste will be collected in skips and the site will be kept tidy and free of debris at all times.<br>› Waste oils and hydraulic fluids will be collected in leak proof containers and removed from the site for disposal or recycling. It is also essential that all empty oil containers and other hazardous wastes be disposed of in accordance with the requirements of the Waste Management Act, 1996 as amended. | | |

| Mitigation Measure | Reference Location | Mitigation Measure | Audit Result | Action Required |
|---|---|---|---|---|
| | | › All construction waste materials will be stored within the confines of the construction site compound, prior to removal from the site to an appropriately licensed waste facility.<br>› No wastewater will be discharged on-site during the construction phase. | | |
| | | **Construction Manager/Site Manager** | | |
| 16 | CEMP Section 4.1 | The Site Manager will have overall responsibility for the organisation and execution of all related environmental activities as appropriate, in accordance with regulatory and project environmental requirements. The duties and responsibilities of the Site Supervisor will include:<br><br>› Ensure that all works are completed safely and with minimal environmental risk;<br>› Approve and implement the CEMP and supporting environmental documentation, and ensure that all environmental standards are achieved during the construction phase of the project;<br>› Take advice from the Ecological Clerk of Works (ECoW) on legislation, mitigation measures, codes of practice, guidance notes and good environmental working practice relevant to their work;<br>› Ensure compliance through audits and management site visits;<br>› Ensure timely notification of environmental incidents; and,<br>› Ensure that all construction activities are planned and performed such that minimal risk to the environment is introduced;<br>› Provide full and adequate supervision and site administration during the progress of the works; | | |
| | | **Ecological Clerk of Works** | | |

| Mitigation Measure | Reference Location | Mitigation Measure | Audit Result | Action Required |
|---|---|---|---|---|
| 17 | CEMP Section 4.2 | The main contractor appointed to carry out the works on site will be required to provide a level of supervision on site in the form of an Ecological Clerk of Works (EcOW). In general, this ECoW will maintain responsibility for monitoring the works and Contractors/Sub-contractors from an environmental perspective and ensuring that all mitigation measures outlined in this CEMP are implemented at the site. The ECoW will act as the regulatory interface on environmental matters by reporting directly to the client and liaising with Sligo County Council and other statutory bodies as required. The duties of the appointed ECoW are summarised as follows:<br><br>› Maintain and update as required the Construction Phase CEMP and supporting environmental documentation and review/approval of contractor method statements.<br>› Undertake inspections and reviews to ensure the works are carried out in compliance with the CEMP.<br>› Monitor the implementation of the CEMP, particularly all proposed/required Environmental monitoring and mitigation.<br>› Advise site management/contractor/sub-contractors on:<br>› Prevention of environmental pollution and improvement to existing working methods.<br>› Changes in legislation and legal requirements affecting the environment.<br>› Suitability and use of plant, equipment and materials to prevent pollution.<br>› Environmentally sound methods of working and systems to identify environmental hazards.<br>› Ensure proper mitigation measures are initiated and adhered to during the construction phase.<br>› Ensure adequate arrangements are in place for site personnel to identify potential environmental incidents. | | |

| Mitigation Measure | Reference Location | Mitigation Measure | Audit Result | Action Required |
|---|---|---|---|---|
| | | › Ensure that details of environmental incidents are communicated in a timely manner to the relevant regulatory authorities, initially by phone and followed up as soon as is practicable by email.<br>› Support the investigation of incidents of significant, potential or actual environmental damage, and ensure corrective actions are carried out, recommend means to prevent recurrence and communicate incident findings to relevant parties.<br>› The ECoW will initially be present on a daily basis until the site is set up and construction is underway.<br>› The frequency and extent of the site supervision will be up to the ECoW, which will depend on the functioning of all listed mitigation measures in the NIS and EcIA, and how well they are adhered to by contractors on site.<br>› The ECoW will make regular visits to the site throughout the construction phase of the<br>Proposed Works, and details of the functionality and adherence to mitigation measures will be recorded during each visit.<br>› It will be the responsibility of the ECoW to ensure that the biosecurity measures outlined in Section 3.6 of this CEMP are in place.<br>› All site visit reports, and documentation will be collated into a final report which will be sent to Sligo County Council for review to ensure compliance with the mitigation measures outlined in the NIS and EcIA.<br>› The ECoW will have the authority to stop all of the works on site if the ECoW has reasonable doubt that the prescribed mitigation measures are not being adhered to properly.<br>› The ECoW will be present for all works taking place upstream of the bridge, in areas identified as providing suitable spawning habitat.<br>› Once the dry working area has been established, the ECoW will be responsible for making out the area of suitable nursery habitat in the south right hand bank (RHB) downstream of the bridge, as shown in Figure 3-1. | | |

| Mitigation Measure | Reference Location | Mitigation Measure | Audit Result | Action Required |
|---|---|---|---|---|
| | | › The ECoW will ensure that all machinery and personnel do not enter this area at any stage during the construction phase. | | |
| | | **Initial Steps** | | |
| 18 | CEMP Section 4.3.3 | In the event of an emergency situation associated with, but not restricted to, the hazards outlined in Table 4-1 the Site Manager will carry out the following:<br>› Establish the scale of the emergency situation and identify the number of personnel, if any, have been injured or are at risk of injury.<br>› Where necessary, sound the emergency siren/foghorn that activates an emergency evacuation on the site.<br>› Make safe the area if possible and ensure that there no identifiable risk exists with regard to dealing with the situation e.g., if a machine has turned over, ensure that it is in a safe position so as not to endanger others before assisting the injured.<br>› Contact the required emergency services or delegate the task to someone if he is unable to do so. If delegating the task, ensure that they follow the procedures for contacting the emergency services as set out in Section 4.3.6.<br>› Take any further steps that are deemed necessary to make safe or contain the emergency incident e.g., cordon off an area where an incident associated with electrical issues has occurred.<br>› Contact any regulatory body or service provider as required e.g., ESB Networks the numbers for which as provided in Section 4.3.6.<br>› Contact the next of kin of any injured personnel where appropriate. The procedure for this is outlined in Section 4.3.6. | | |
| | | **Site Evacuation/Fire Drill** | | |

| Mitigation Measure | Reference Location | Mitigation Measure | Audit Result | Action Required |
|---|---|---|---|---|
| 19 | CEMP Section 4.3.4 | A site evacuation/fire drill procedure will provide basis for carrying out the immediate evacuation of all site personnel in the event of an emergency. The following steps will be taken:<br><br>› A Site Security Officer will be appointed by the Site Manager.<br>› Notification of the emergency situation. Provision of a siren or foghorn to notify all personnel of an emergency situation.<br>› An assembly point will be designated in the construction compound area and will be marked with a sign. All site personnel will assemble at this point.<br>› A roll call will be carried out by the Site Security Officer to account for all personnel on site.<br>› The Site Security Officer will inform the Site Manager when all personnel have been accounted for. At this time the Site Manager will decide the next course of action which will be determined by the situation that exists at that time. The Site Manager will advise all personnel accordingly.<br><br>All personnel will be made aware of the evacuation procedure during site induction. The Fire Services Acts of 1981 and 2003 require the holding of fire safety evacuation drills at specified intervals and the keeping of records of such drills. | | |
| **Contacting Emergency Services** | | | | |
| **Emergency Communications Procedure** | | | | |
| 20 | CEMP Section 4.3.6.1 | In the event of requiring the assistance of the emergency services the following steps should be taken:<br><br>› Stay calm. It is important to take a deep breath and not get excited. Any situation that requires 999/112 is, by definition, an emergency. The dispatcher | | |

| Mitigation Measure | Reference Location | Mitigation Measure | Audit Result | Action Required |
|---|---|---|---|---|
| | | or call-taker knows that and will try to move things along quickly, but under control.<br>› Know the location of the emergency and the number you are calling from. This may be asked and answered a couple of times but do not get frustrated. Even though many emergencies call centres have enhanced capabilities meaning they are able to see your location on the computer screen they are still required to confirm the information. If for some reason you are disconnected, at least emergency crews will know where to go and how to call you back.<br>› Wait for the call-taker to ask questions, then answer clearly and calmly. If you are in danger of assault, the dispatcher or call-taker will still need you to answer quietly, mostly "yes" and "no" questions.<br>› If you reach a recording, listen to what it says. If the recording says your call cannot be completed, hang up and try again. If the recording says all call takers are busy, WAIT. When the next call-taker or dispatcher is available to take the call, it will transfer you.<br>› Let the call-taker guide the conversation. He or she is typing the information into a computer and may seem to be taking forever. There is a good chance, however, that emergency services are already being sent while you are still on the line.<br>› Follow all directions. In some cases, the call-taker will give you directions. Listen carefully, follow each step exactly, and ask for clarification if you do not understand.<br>› Keep your eyes open. You may be asked to describe victims, suspects, vehicles, or other parts of the scene.<br>› Do not hang up the call until directed to do so by the call taker. | | |

# 6. MONITORING PROPOSALS

The Monitoring Proposals which will be implemented are presented in this section of the CEMP.

By presenting the monitoring proposals in the below format, it is intended to provide an easy to audit list that can be reviewed and reported on during the future phases of the project.

| Monitoring Measure | Reference Location | Monitoring Measure | Audit Result | Action Required |
|---|---|---|---|---|
| **Water Quality Monitoring** | | | | |
| 1 | CEMP Section 3.5.4 | Automated turbidity metres will be installed upstream and downstream of the Proposed Works area for suspended solids, and these will be monitored regularly by a suitably qualified ecologist. If there is a 20% difference between the downstream reading and the upstream reading, then all works will be halted until the source of the problem is rectified | | |
| 2 | CEMP Section 3.1.4 | Regular pH checks will be carried out on any pumped water from the dry working area during cement works. | | |

# 7. PROGRAMME OF WORKS

## 7.1 Construction Programme

The bridge repair works will take approximately 3 months to complete. The works will be broken down into phases. An example of the programme of works is outlined in Table 8-1 below. The construction programme will be finalised on appointment of a contractor before commencement of upgrade works.

*Table 7-1 Phasing Scope of Works*

| Phase No. | Description | Scope of works |
|---|---|---|
| Phase 1 | Site Setup | This stage includes the erection of traffic barriers, signage, and lights along with introduction of construction plant and machinery. This section will also include the establishment of a construction site compound. |
| Phase 2 | Dry Works Area Establishment | This section will involve the establishment of the dry works area required to make repairs on the bridge and adjacent riverbed. |
| Phase 3 | Excavation | This stage will involve excavation down to appropriate stratum using handheld spades and shovels and 1.5 tonne electric mini digger where necessary. |
| Phase 4 | Construction of “Letterbox” formwork and lining of riverbed. | This stage will entail constructing a “Letterbox” formwork around the base of the piers so that concrete can be poured and the lining of the reduced riverbed with a geotextile layer in preparation for fill with granular material. |
| Phase 4 | Pouring of concrete and infilling material | This phase will include the pouring of concrete, removal of concrete formwork, filling with granular material, placement of the rock riprap layer, and demobilization of machinery. |
| Phase 5 | De-vegetation works | This phase will involve the removal of vegetation growing on the surfaces of the bridge, steam and/or abrasive cleaning, followed by mortar joint repointing of the bridge. |

# 8. COMPLIANCE AND REVIEW

## 8.1 Site Inspections and Environmental Audits

Routine inspections of activities will be carried out on a daily and weekly basis by the Site Environmental Manager/ECoW as appointed by the applicant to ensure all controls to prevent environmental impact, relevant to the construction activities taking place at the time, are in place.

Environmental inspections will ensure that the works are undertaken in compliance with this CEMP. Environmental site inspections will be carried out by suitably trained staff.

## 8.2 Environmental Compliance

The following definitions shall apply in relation to the classification of Environmental Occurrences during the infilling works:

### Environmental Near Miss

An occurrence which if not controlled or due to its nature could lead to an Environmental Incident.

### Environmental Incident

Any occurrence which has potential, due to its scale and nature, to migrate from source and have an environmental impact beyond the site boundary.

### Environmental Non-Compliance

Non-fulfilment of a requirement and includes any deviations from established procedures, programs and other arrangements related to the CEMP.

## 8.3 Corrective Action Procedure

A corrective action is implemented to rectify an environmental issue on-site. Corrective actions will be implemented by the Site Manager, as advised by the ECoW. Corrective actions may be required as a result of the following.

- Environmental Audits.
- Environmental Inspections and Reviews.
- Environmental Incidents; and,
- Environmental Complaints.

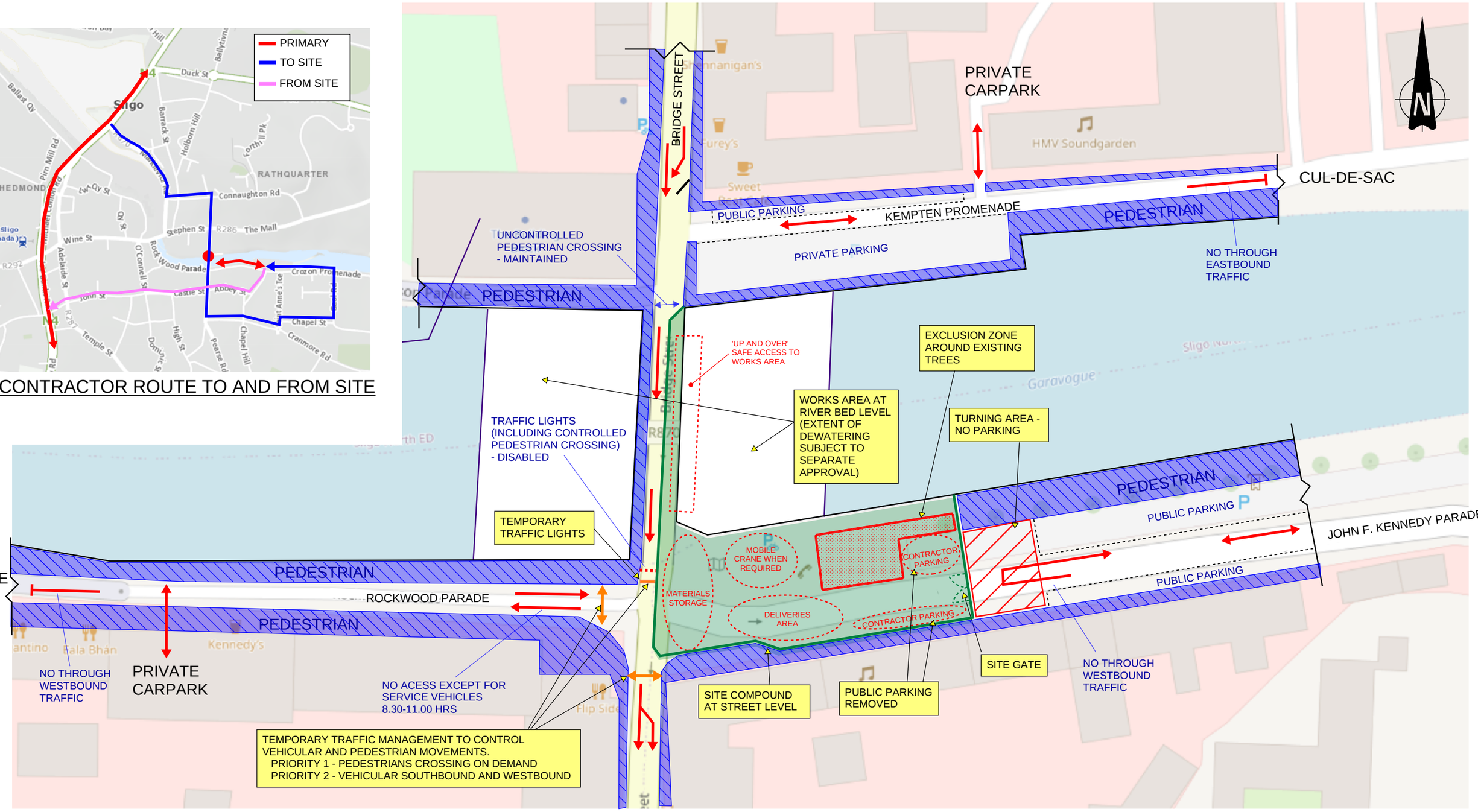
A Corrective Action Notice will be used to communicate the details of the action required to the main contractor. A Corrective Action Notice is a form that describes the cause and effect of an environmental problem on site and the recommended corrective action that is required. The Corrective Action Notice, when completed, will include details of close out and follow up actions.

If an environmental problem occurs on site that requires immediate attention direct communications between the Site Manager and the EcOW will be conducted. This in turn will be passed down to the site staff involved. A Corrective Action Notice will be completed at a later date.

# APPENDIX A

## *TRAFFIC MANAGEMENT AND SITE SETUP*

CONTRACTOR ROUTE TO AND FROM SITE



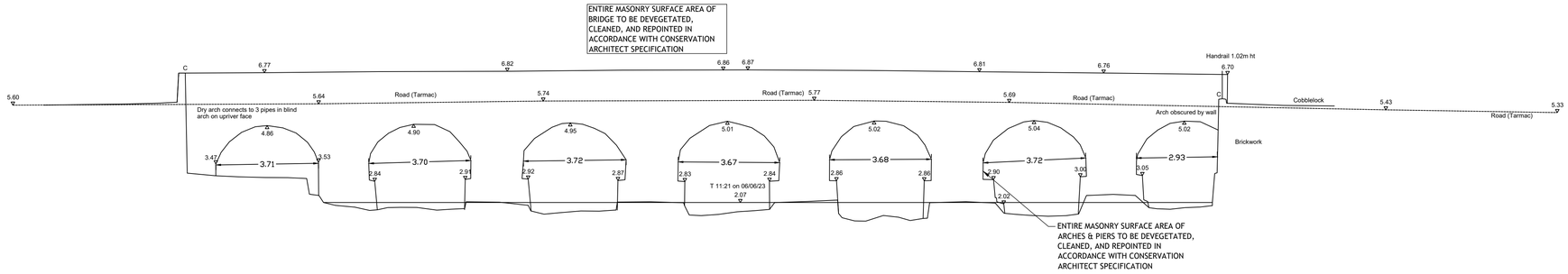

TEMPORARY TRAFFIC MANAGEMENT AND SITE SETUP

| | | | |
|---|---|---|---|
| PROJECT: | 224138 MARKIEVICZ BRIDGE REPAIRS | | |
| SKETCH TITLE: | CONSTRUCTION TRAFFIC | | |
| SKETCH NO. | 2224138-PUNCH-XX-XX-SK-CS-0006 | | |
| DESIGNER: | KOR | DATE: | 18/11/2024 |

# APPENDIX B

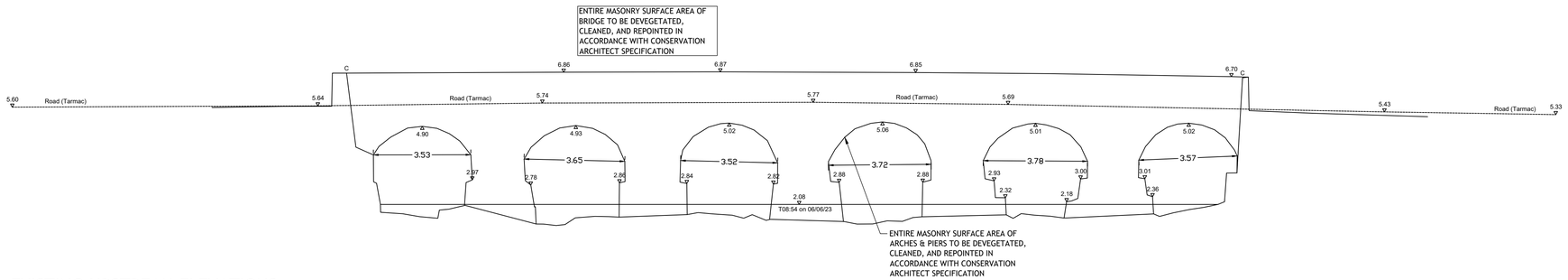
## *CONSTRUCTION METHODOLOGY*

NOTES:
1. ALL DIMENSIONS IN METERS UNLESS NOTED OTHERWISE.
2. DO NOT SCALE FROM THIS DRAWING, USE FIGURED DIMENSIONS ONLY.




## EXISTING DOWNSTREAM ELEVATIONS

SCALE 1:100




## EXISTING UPSTREAM ELEVATIONS

SCALE 1:100

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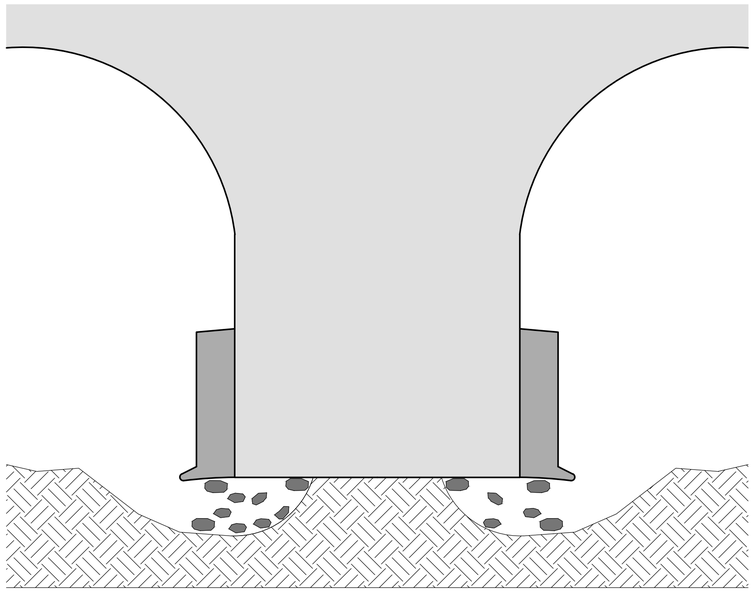
PUNCH consulting engineers
Dublin | Limerick | Cork | Galway | Glasgow
Carnegie House Library Road,
Dun Laoghaire, Co. Dublin, A96 C7W7
t +353 1 271 2200 | w punchconsulting.com

| | | | | |
|---|---|---|---|---|
| Project: MARKIEVICZ BRIDGE REHABILITATION | | | | |
| Title: EXISTING BRIDGE - MASONRY REPAIRS | | | | |
| Drawn: Foxx McGibbon | Date drawn: December 2024 | Technician Check: | Engineer Check: Kevin D O'Riordan | Approved: Kevin D O'Riordan |
| Project No: 224138 | Model Ref: 224138-PUNCH-XX-XX-M2-C-0100 | | Drawing Status: A0 (Planning) | |
| Scale @ A1: AS SHOWN | Document No: 224138-PUNCH-XX-XX-DR-C-0100 | | | Revision No: C01 |

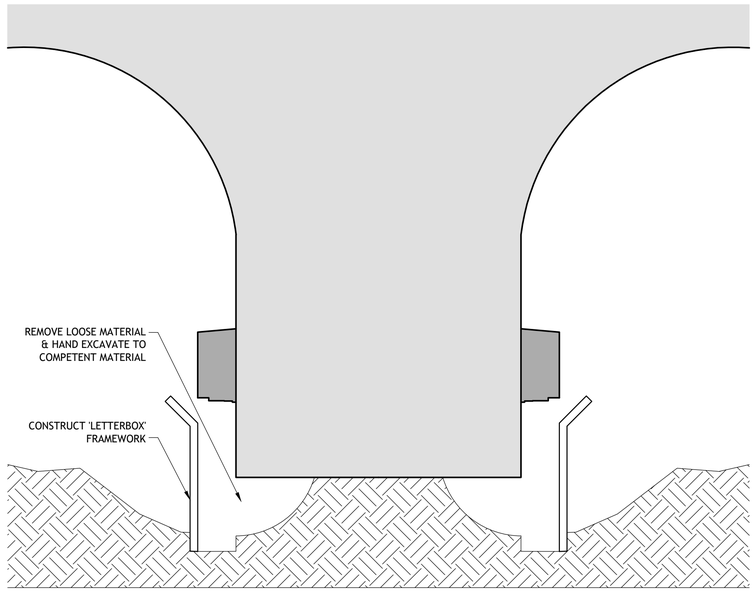
NOTES:
1. ALL DIMENSIONS IN METERS UNLESS NOTED OTHERWISE.
2. DO NOT SCALE FROM THIS DRAWING, USE FIGURED DIMENSIONS ONLY.

LEGEND

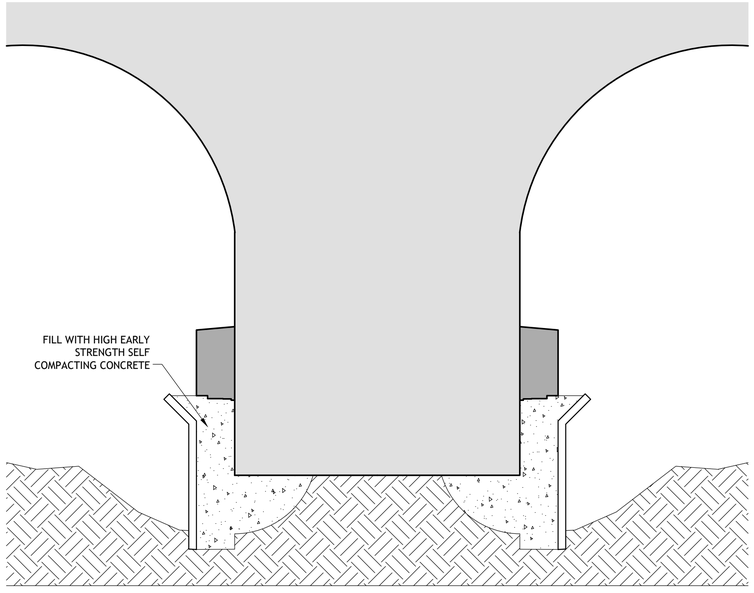
- MASONRY PIER
- CONCRETE SKIRT
- EXTENT OF SCOUR



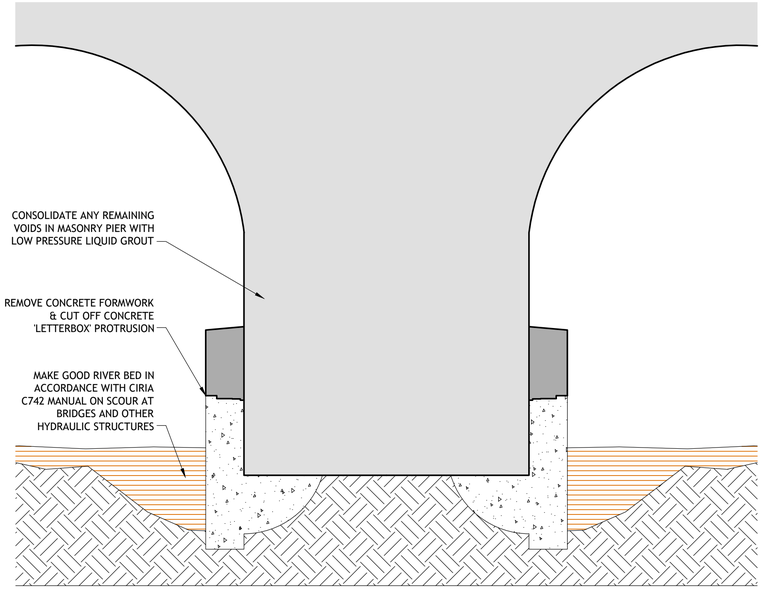
EXISTING PIER
SCALE 1:20




PROPOSED STEP 1
SCALE 1:20




PROPOSED STEP 2
SCALE 1:20




PROPOSED STEP 3
SCALE 1:20


EXISTING PIER LAYOUT
SCALE 1:20

1:100
2m 0 2m 4m 6m 8m 10m

1:20
400mm 0 400mm 800mm 1200mm 1600mm 2000mm





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Dublin | Limerick | Cork | Galway | Glasgow
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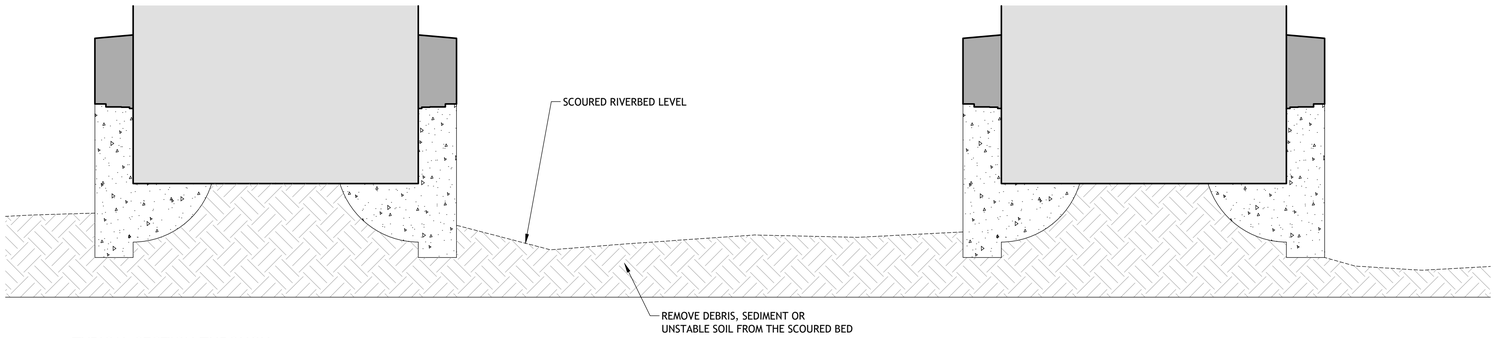
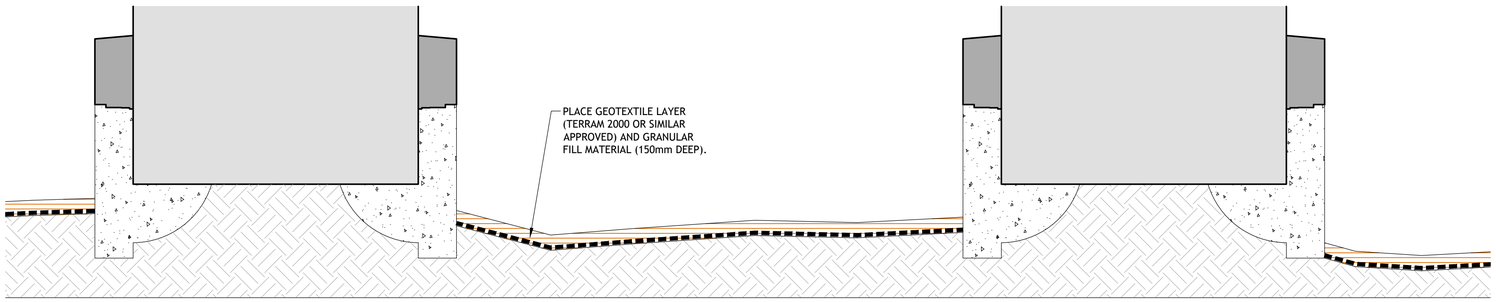
t +353 1 271 2200 | w punchconsulting.com

| | | | | |
|---|---|---|---|---|
| Project: MARKIEVICZ BRIDGE REHABILITATION | | | | |
| Title: EXISTING STRUCTURAL PIER SCOUR REPAIRS | | | | |
| Drawn: F McGibbon | Date drawn: NOVEMBER 2024 | Technician Check: PJ Mulcahy | Engineer Check: Kevin D O'Riordan | Approved: Kevin D O'Riordan |
| Project No: 224138 | Model Ref: 224138-PUNCH-XX-XX-M2-C-0201 | | Drawing Status: A0 (Planning) | |
| Scale @ A1: AS SHOWN | Document No: 224138-PUNCH-XX-XX-DR-C-0201 | | | Revision No: C01 |



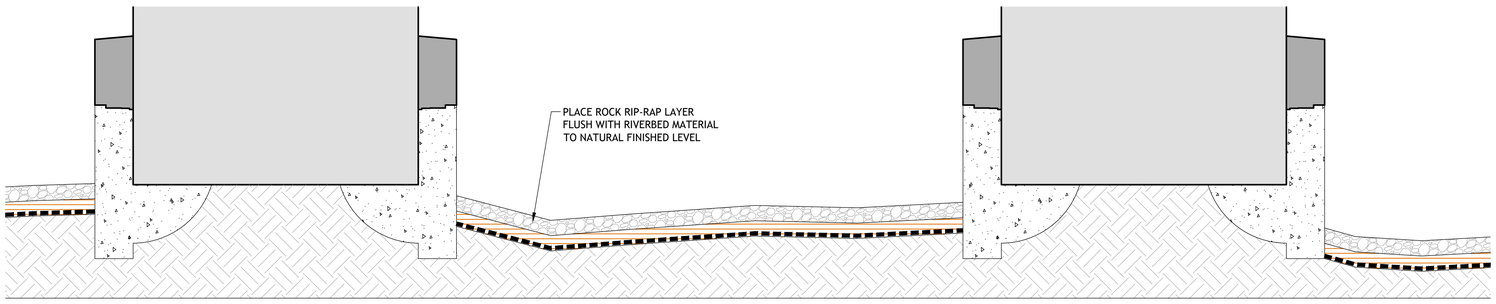

TYPICAL SECTION THROUGH
RIVERBED SCOUR REPAIR WORKS
- PROPOSED STEP 1

SCALE 1:20




TYPICAL SECTION THROUGH
RIVERBED SCOUR REPAIR WORKS
- PROPOSED STEP 2

SCALE 1:20




TYPICAL SECTION THROUGH
RIVERBED SCOUR REPAIR WORKS
- PROPOSED STEP 3

SCALE 1:20

| REQUIREMENTS FOR BEDDING GRAVEL | |
|---|---|
| GRADINGS | d50 = 50mm |
| SHAPE | ≤ 3.0 |
| PROPORTION OF CRUSHED OR BROKEN SURFACES | ≤ 50% |
| PARTICLE DENSITY | 2.5 |
| PLASTICITY INDEX | NON PLASTIC |
| LOS ANGELES COEFFICIENT | LA ≤ 35% (PER IS EN 1097-2) |
| SLAKE DURABILITY | > 90% |
| RESISTANCE TO WEAR | 60 TO 80% |

| REQUIREMENTS FOR ROCK ARMOUR | |
|---|---|
| GRADINGS | d50 = 250mm |
| SHAPE | ≤ 2.5 |
| PROPORTION OF CRUSHED OR BROKEN SURFACES | 90% |
| PARTICLE DENSITY | 2.5 |
| PLASTICITY INDEX | NON PLASTIC |
| LOS ANGELES COEFFICIENT | LA ≤ 35% (PER IS EN 1097-2) |
| SLAKE DURABILITY | >90% |
| RESISTANCE TO WEAR | 60 TO 80% |

## NOTES:

1. ALL DIMENSIONS IN METERS UNLESS NOTED OTHERWISE.
2. DO NOT SCALE FROM THIS DRAWING, USE FIGURED DIMENSIONS ONLY.
3. USE NON-WOVEN GEOTEXTILE WITH A MINIMUM TENSILE STRENGTH OF [X] kN/m AND PERMEABILITY OF [Y] M/S.
4. OVERLAP ADJACENT GEOTEXTILE SHEETS BY A MINIMUM OF 0.5M AND SECURE IN PLACE BEFORE PLACING THE GRANULAR LAYER.
5. GEOTEXTILE SHALL BE TERRAM 2000 OR SIMILAR APPROVED.
6. THE GEOTEXTILE FABRIC SHALL BE PLACED DIRECTLY ON THE PREPARED RIVERBED, FREE OF DEBRIS AND SHARP OBJECTS.
7. GRANULAR FILL MATERIAL TO BE PLACED ON THE GEOTEXTILE IN A LAYER 150MM DEEP.
8. THE GRANULAR FILL LAYER SHALL BE PLACED EVENLY OVER THE GEOTEXTILE TO PREVENT PUNCTURING AND PROVIDE A STABLE BEDDING FOR THE RIPRAP.
9. GRANULAR FILL MATERIAL TO MEET SPECIFICATION REQUIREMENTS SHOWN IN BOX 1.
10. RIPRAP SHALL BE LAID ONTO OF THE GRANDULAR FILL MATERIAL TO A DEPTH MATCHING THE SURROUNDING RIVER BED LEVELS.
11. RIPRAP TO MEET SPECIFICATION REQUIREMENTS SHOWN IN BOX 2.
12. RIPRAP SHALL BE PLACED GRADUALLY, AVOIDING FREE FALL TO PREVENT DAMAGE TO UNDERLYING LAYERS
13. SCOUR HOLES LESS THAN 400MM DEEP TO BE FILLED WITH GRANULAR FILL MATERIAL ONLY. SURROUNDING GRAVEL MATERIAL WITHIN THE RIVERBED CAN BE USED WHERE POSSIBLE.





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Dublin | Limerick | Cork | Galway | Glasgow
Carnegie House Library Road,
Dun Laoghaire, Co. Dublin, A96 C7W7
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| | | | | |
|---|---|---|---|---|
| Project: MARKIEVICZ BRIDGE REHABILITATION | | | | |
| Title: RIVERBED SCOUR REPAIRS | | | | |
| Drawn: F McGibbon | Date drawn: NOVEMBER 2024 | Technician Check: PJ Mulcahy | Engineer Check: Kevin D O'Riordan | Approved: Kevin D O'Riordan |
| Project No: 224138 | Model Ref: 224138-PUNCH-XX-XX-M2-C-0202 | | Drawing Status: A0 (Planning) | |
| Scale @ A1: AS SHOWN | Document No: 224138-PUNCH-XX-XX-DR-C-0202 | | | Revision No: C01 |

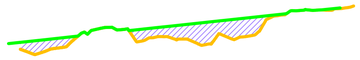
NOTES:
1. ALL DIMENSIONS IN METERS UNLESS NOTED OTHERWISE.
2. DO NOT SCALE FROM THIS DRAWING, USE FIGURED DIMENSIONS ONLY.

LEGEND:

DENOTES EXTENT OF FILL MATERIAL

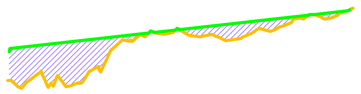
DENOTES BRIDGE PIER / ABUTMENT

| FILL LEGEND | | | | |
|---|---|---|---|---|
| MINIMUM LEVEL | MAXIMUM LEVEL | COLOUR | AREA | VOLUME |
| 0.00 | 0.20 | | 262.241m2 | 67.184m3 |
| 0.20 | 0.40 | | 138.524m2 | 30.165m3 |
| 0.40 | 0.60 | | 56.842m2 | 11.536m3 |
| 0.60 | 0.80 | | 27.575m2 | 3.012m3 |
| 0.80 | 1.00 | | 4.287m2 | 0.198m3 |



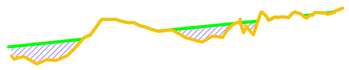
| | | | | |
|---|---|---|---|---|
| Proposed Levels | 1.539 | 1.754 | 1.869 | 2.152 |
| Existing Levels | | 1.697 | 1.675 | 2.152 |
| Chainage | 00.000 | 10.000 | 20.000 | 28.154 |

SECTION A



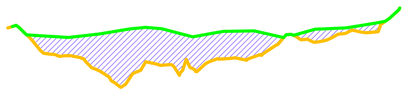
| | | | | |
|---|---|---|---|---|
| Proposed Levels | 1.459 | 1.678 | 1.901 | 2.115 |
| Existing Levels | 0.935 | 1.594 | 1.721 | 2.115 |
| Chainage | 00.000 | 10.000 | 20.000 | 28.179 |

SECTION B



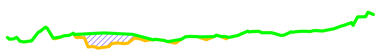
| | | | | |
|---|---|---|---|---|
| Proposed Levels | 1.418 | 1.815 | 1.834 | 2.051 |
| Existing Levels | 1.272 | 1.815 | 1.632 | 2.051 |
| Chainage | 00.000 | 10.000 | 20.000 | 27.263 |

SECTION C



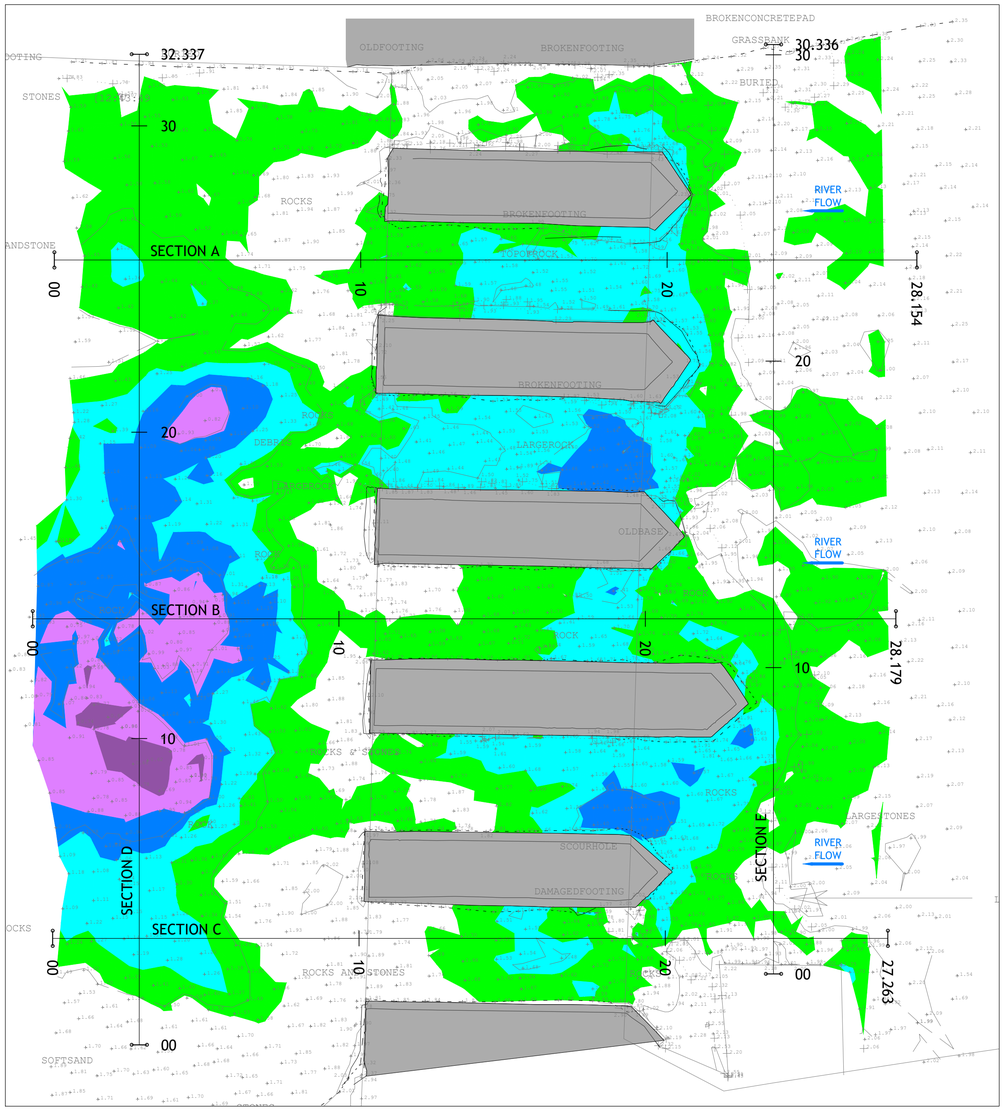
| | | | | | |
|---|---|---|---|---|---|
| Proposed Levels | 1.616 | 1.600 | 1.567 | 1.694 | 1.940 |
| Existing Levels | 1.616 | 0.809 | 1.137 | 1.550 | 1.940 |
| Chainage | 00.000 | 10.000 | 20.000 | 30.000 | 32.337 |

SECTION D



| | | | | |
|---|---|---|---|---|
| Proposed Levels | 1.929 | 2.054 | 2.092 | 2.388 |
| Existing Levels | 1.929 | 1.901 | 2.092 | 2.388 |
| Chainage | 00.000 | 10.000 | 20.000 | 30.336 |

SECTION E




RIVERBED SCOUR LAYOUT
SCALE 1:100

1:100
2m 0 2m 4m 6m 8m 10m

1:250
5m 0 5m 10m 15m 20m 25m

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Carnegie House Library Road, Dun Laoghaire, Co. Dublin, A96 C7W7
t +353 1 271 2200 | w punchconsulting.com

| | | | | |
|---|---|---|---|---|
| Project: MARKIEVICZ BRIDGE REHABILITATION | | | | |
| Title: RIVERBED SCOUR REPAIR SECTIONS | | | | |
| Drawn: F McGibbon | Date drawn: NOVEMBER 2024 | Technician Check: | Engineer Check: Kevin D O'Riordan | Approved: Kevin D O'Riordan |
| Project No: 224138 | Model Ref: 224138-PUNCH-XX-XX-M2-C-0203 | | Drawing Status: A0 (Planning) | |
| Scale @ A1: AS SHOWN | Document No: 224138-PUNCH-XX-XX-DR-C-0203 | | | Revision No: C01 |