

TO 334 Munster Bridges Term Maintenance

Knockbrack Culvert - Natura Impact Statement

Transport Infrastructure Ireland

19/03/2024



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1. Introduction

WS Atkins Ireland Ltd (“Atkins”) was commissioned by Transport Infrastructure Ireland (TII) to prepare a Natura Impact Statement (NIS) for the proposed works at Knockbrack Culvert, Co. Kerry. The site location is shown in Figure 1-1 below.

This document comprises the NIS for the proposed works and is intended to provide TII, in its capacity as the competent authority, with objective information to inform its Appropriate Assessment (AA) determination on the implications of the proposed works for European sites.



Figure 1.1 Knockbrack Culvert location.

1.1. Project Description

Knockbrack Culvert (KY-N59-006.00) is a single span (3m) concrete culvert structure carrying the N59 national secondary road over the Fahavane stream (EPA name) Knockbrack, Co. Kerry. The structure has a total length of 25.9m. There is a disused masonry bridge approximately 15m upstream of the culvert. A concrete apron covers the riverbed from the old bridge to the Culvert (15m) and downstream of the culvert to approximately 20m. The culvert is constructed of concrete box units.

1.1.1. Proposed Works

The works to Knockbrack Culvert comprise the removal and reconstruction of the concrete apron and training walls between the culvert and the old disused bridge. Voids and cracks in the box culvert/downstream apron are to be repaired by means of cementitious grout and suitable repair concrete.

- Existing riverbed apron (Upstream of culvert) a training wall to be broken out and disposed of offsite. New cast in situ reinforced concrete apron to be constructed. At the request of IFI the apron will be constructed with a dish/ deeper channel to the centre of the stream. This is to aid fish passage through the structure.
- Embankment behind existing training walls to be excavated and filled to allow for installation of new training walls.
- Once the upstream hardstand has been excavated the inlet to the box culvert is to be pumped with cementitious grout fill 3 no. pump locations located 1m from the first box section and 1m between each pumping location.
- New apron to be cast in 3 separate sections each 5m in length. End sections to be poured first followed by the middle section.
- The base of each box unit shall be drilled through and injected with cementitious grout fill.
- Voids and cracking (Downstream of culvert) to existing concrete apron to be repaired with suitable repair mortar.

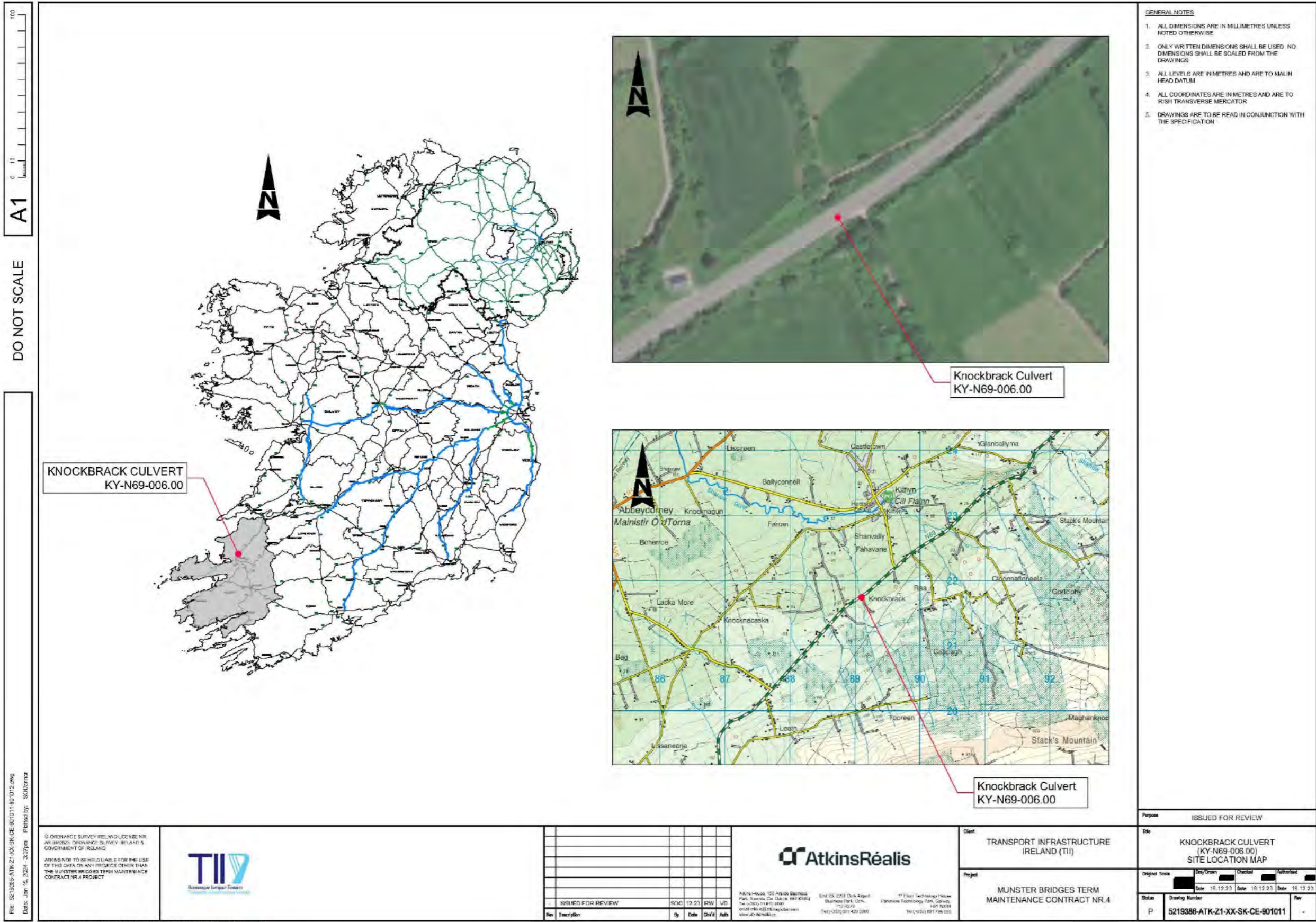


Figure 1.2 Site Location.

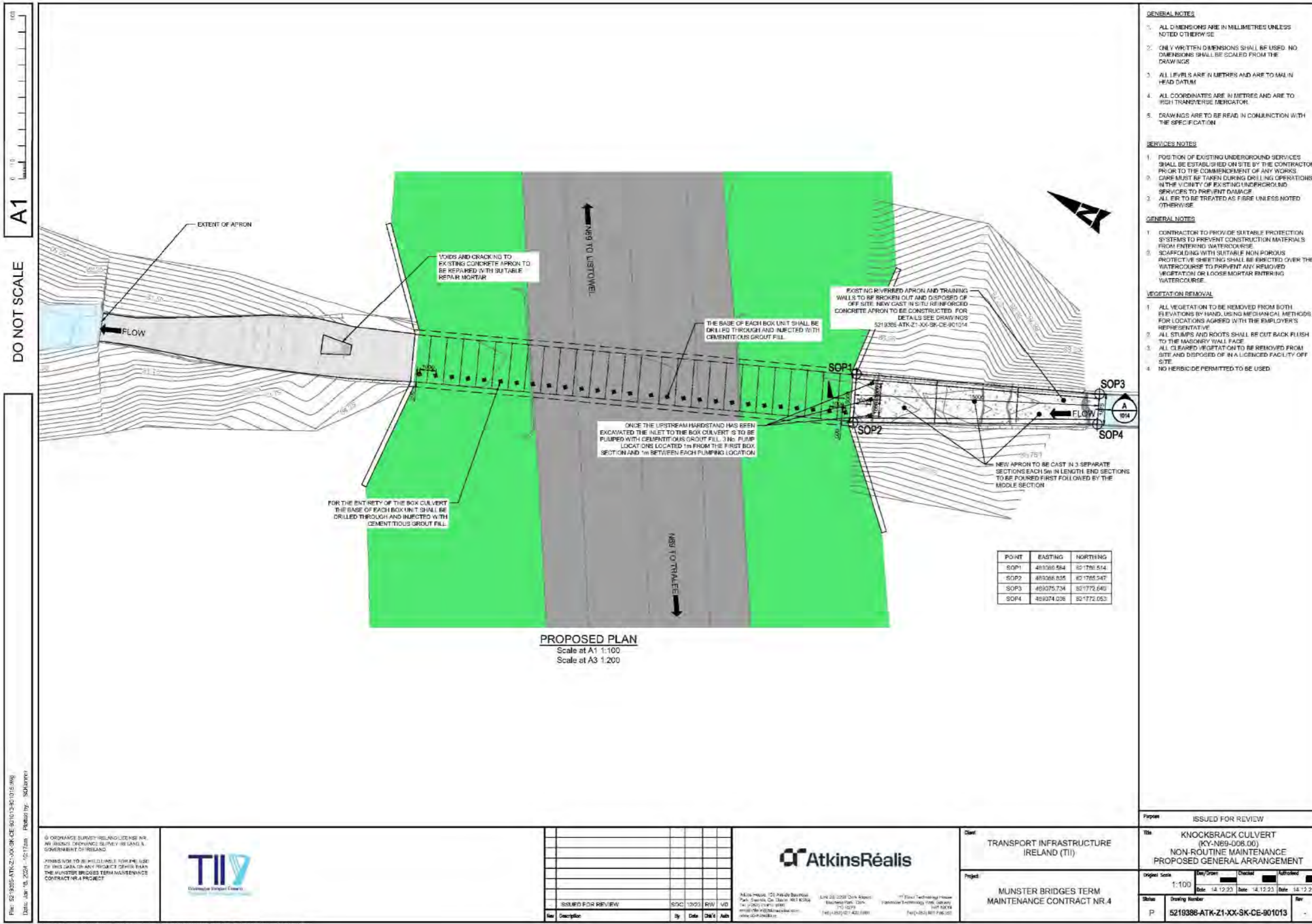


Figure 1.3 Site Layout Plan.

1.2. Bridge Photos

The following series of photos were taken during the structural assessment of Knockbrack Culvert (KY-N69-006.00). Access to all parts of the bridge were facilitated during this survey work.



Plate 1-1 Bridge approach from east.



Plate 1-2 Culvert downstream elevation.



Plate 1-3 Apron downstream of culvert.



Plate 1-4 Defects to apron downstream of culvert.



Plate 1-5 View of apron damage looking upstream of culvert looking towards old railway bridge.



Plate 1-6 Damage to existing plinth upstream of culvert, western bank.



Plate 1-7 Upstream of culvert looking downstream, apron damage visible.



Plate 1-8 Upstream of culvert eastern bank, apron damage visible.

1.3.2. Sequence of works

- When working on the road, set up TTMP as per plan. The road will be reduced to one lane over the area of works for concrete pour.
- Tools and equipment will not be cleaned in the watercourse.
- IFI will be notified of the works prior to starting on site as electrofishing may be required.
- A pump will be setup on an embankment upstream, a crane or hi-ab lorry may be required to lower the pump into position.
- A wall of hessian sandbags will be built 5m upstream of the damaged apron which will stop water flowing back into the works area. A Hessian sandbag wall will also be setup downstream. Sandbags are to be filled with material sourced from a local quarry and be of a similar type as the catchment within which the stream is Located.
- Sandbags should only be half filled with sand and tied & sealed to ensure no sand enters the watercourse.
- Sandbags should be “walked in” to riverbed to create good seal between sandbags and riverbed.
- Sandbags to be built up in stretcher bond to desired height.
- Any water that seeps through the sandbags will flow to a sump and will be pumped to a grassy area adjacent to the bridge for filtration as required (to adjoining field).
- Pumps shall be screened to prevent the intake of fish.
- A secondary pump will be stored on site as a backup.
- Works will be done in the dry.
- When the water management is setup removing the existing damaged apron will begin.
- The existing concrete apron will be removed using a 1.5T excavator and rock breaker. Kango hammers and jack hammers will also be used when necessary.
- There is an existing access track which the Contractor is hoping to use. In the event that the landowner does not agree to its use, the excavator will be lowered into the culvert with a 100T crane that will be set up on the hard shoulder of the carriageway.
- Material that is to be taken out of the culvert will be put into 1T bags and lifted to roadside using the crane. Material is to be disposed of in a licenced waste facility.
- When the damaged apron has been removed, fill material will be lowered into the work area in 1ton bags using the crane (full removal is just upstream, with repairs via pumping of grout to undermined / eroded areas within and downstream of the culvert).
- When complete ready-mix concrete will be delivered to site in a volumetric lorry.
- A concrete pump will be used to get the concrete into the works area.
- Any contaminated water within the hessian sandbag bund will be pumped 25m away into a vegetated area (to adjoining field).

- Localised repairs will be carried out downstream, these works will be done in the dry (this is limited to injection of grout to undermined / eroded areas within and downstream) (refer to accompanying drawings for full details).
- Site clean-up including removal of all waste/superfluous materials.
- De-mobilise.

1.3.3. Ecological Notes

1.3.3.1. Birds

No birds' nests were recorded on the structure. The underpass appears largely unsuitable as a site for nesting Dipper (*Cinclus cinclus*) or Grey Wagtail (*Motacilla cinerea*). Dipper nests are closed / domed nests often located on supports or in cavities under bridges. As can be seen in e.g. Plate 1.6, no such features are present on the underpass. Also, as can be seen in the photos, the embankments close to the bridge do not support suitable areas for Kingfisher to excavate nests.

However, all birds' nests are protected by law. Should any nests be encountered in or around the underpass, these will be checked by the Contractor's ecologist.

1.3.3.2. Invasive species

No invasive plant species listed on the 3rd Schedule of the European Communities (Birds Natural Habitats) Regulations, 2011 (S.I. 477 of 2011) have been noted at the proposed works area. The site visit was outside the survey window for invasive species, as such the contractors ecologist will carry out an assessment prior to the works commencing.

Note that while Giant Hogweed is an invasive non-native plant species, it is also a significant health risk due to its phototoxic sap. Should any be encountered the necessary safety measures should be put in place.

If an invasive plant species listed on the Natural Habitats Regulations is encountered when the Contractor mobilises, the advice of the Contractor's ecologist is to be sought on factors such as size of exclusion zone, etc. This is also to be communicated to the resident engineer.

2. Scope of Study

The aim of this report is to provide supporting information to assist the competent authority to carry out an Appropriate Assessment with respect to the proposed project.

2.1. Legislative Context

Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora, known as the ‘Habitats Directive’ provides legal protection for habitats and species of European importance. Article 2 of the Directive requires the maintenance or restoration of habitats and species of European Community interest, at a favourable conservation status. Articles 3 – 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservations of an EU-wide network of sites known as European sites. European sites are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/EEC).

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans or projects that could potentially affect European sites. Article 6(3) establishes the requirement for Appropriate Assessment: -

“Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.”

Article 6 (4) deals with the steps that should be taken when it is determined, as a result of Appropriate Assessment, that a plan or project will adversely affect a European site. Alternative solutions, imperative reasons of overriding public interest (IROPI) and compensatory measures need to be addressed in this case. Article 6(4) states: -

“If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.

Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission to other imperative reasons of overriding public interest.”

2.2. Appropriate Assessment Process

Guidance on the AA process was produced by the European Commission (EC, 2001; 2018), which was subsequently used to develop guidance for Ireland by the Department of Environment, Heritage and Local Government in 2009 (DEHLG, 2009) and also by the National Parks and Wildlife Service in 2018¹ (NPWS 2018). These guidance documents set out a staged approach to complete the AA process and outlines the issues and tests at each stage. The stages outlined below are taken from the guidance document *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities* (DEHLG, 2009).

¹ <https://www.npws.ie/development-consultations>

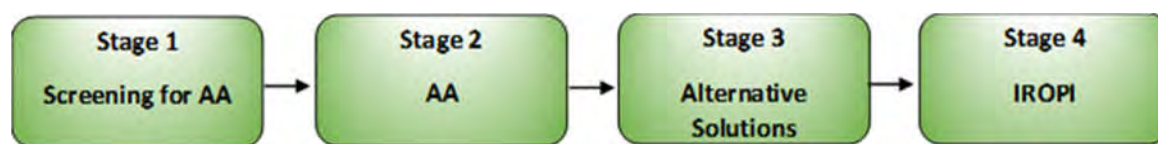


Figure 2.1 Appropriate Assessment Process (Source: DEHLG, 2009).

2.2.1. Screening for Appropriate Assessment

Screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3): -

- i. Whether a plan or project is directly connected to or necessary for the management of the site, and
- ii. Whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a European site in view of its conservation objectives.

If the effects are deemed to be significant, potentially significant, or uncertain, then the process must proceed to Appropriate Assessment.

2.2.2. Appropriate Assessment

Appropriate Assessment considers whether the plan or project, alone or in combination with other projects or plans, will have adverse effects on the integrity of a European site, and includes any necessary mitigation measures.

The competent authority can only agree to the plan or project after having ascertained that it will not adversely affect the integrity of the site(s) concerned. If this cannot be determined, and where sufficient mitigation cannot be achieved, the alternative solutions need to be considered and the process proceeds to the consideration of alternative solutions.

2.2.3. Alternative Solutions

This examines any alternative solutions or options that could enable the plan or project to proceed without adverse effects on the integrity of a European site. The process must return to AA as alternatives will require assessment in order to proceed. Demonstrating that all reasonable alternatives have been considered and assessed, and that the least damaging option has been selected, it is necessary to examine whether there are imperative reasons of overriding interest (IROPI).

2.2.4. IROPI

This examines whether there are imperative reasons of overriding public interest for allowing a plan or project that will have adverse effects on the integrity of a European site to proceed in cases where it has been established that no less damaging alternative solution exists. Compensatory measures must be proposed and assessed, of which the Commission must be informed.

The AA process only progresses through each of the full process for certain plans and projects. For example, for a project not connected with the management of a European site and where no likely significant effects on a European site in view of its conservation objectives are identified, the process stops at Screening for AA. Throughout the process the precautionary principle must be applied, which requires that the conservation objectives of Natura 2000 should prevail where there is uncertainty (EC, 2001; 2018).

3. Methods

3.1. Legislation and Guidance Documents

This report was prepared with reference and due consideration to the following documents and due regard for relevant case law, including but not limited to: -

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna (Habitats Directive).
- European Commission (2018). Managing Natura 2000 sites: the provisions of Article 6 of the ‘Habitats’ Directive 92/43/EEC.
- European Commission (2021). Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC.
- European Commission (2007). Guidance document on Article 6(4) of the ‘Habitats Directive’ 92/49/EEC; clarification of the concepts of: Alternative solutions, Imperative reasons of overriding public interest, Compensatory Measures, Overall Coherence, Opinion of the Commission.
- Department of the Environment, Heritage and Local Government (2009). Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities.
- Office of Planning Regulation (2021). Appropriate Assessment Screening for Development Management. OPR Practice Note PN01.
- Planning and Development Act 2000 (as amended) and Planning and Development Regulations 2001 (as amended).
- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine CIEEM (2018).
- Scott Wilson and Levett-Therivel, (2006). Appropriate Assessment of Plans. Scott Wilson, Levett-Therivel Sustainability Consultants, Treweek Environmental Consultants and Land Use Consultants.
- Inland Fisheries Ireland (2020). Planning for Watercourses in the Urban Environment. A Guide to the Protection of Watercourses through the use of Buffer Zones, Sustainable Drainage Systems, Instream Rehabilitation, Climate / Flood Risk and Recreational Planning. A Guideline Developed by Inland Fisheries Ireland.

3.2. Desk Study

A desk study was carried out to collate information available on European sites in the vicinity of the proposed project. These areas were viewed using Google Earth, Google maps² and Bing maps³ (last accessed on 6/02/2024).

The National Parks and Wildlife Service (NPWS) and National Biodiversity Data Centre (NBDC) online databases were reviewed concerning European sites and their features of interest in the vicinity of the proposed project. The Environmental Protection Agency (EPA) mapping⁴ system was used to identify any hydrological connection between the proposed project and European sites.

² <https://www.google.ie/maps>

³ <http://www.bing.com/maps/>

⁴ <https://gis.epa.ie/EPAMaps/>

Locations and boundaries of all European sites within the potential zone of influence of the proposed project were identified and reviewed using the NPWS online map viewer. Boundary shapefiles were also downloaded from this site to facilitate the preparation of project graphics.

Desktop information on relevant European sites were reviewed on the NPWS website, including the site synopsis for each SAC/SPA, the conservation objectives, the site boundaries as shown on the NPWS online map viewer, the standard Natura 2000 Data Form for the SAC/SPA which details conditions and threats of the sites, and published information and unpublished reports on the relevant European sites.

Relevant planning information for the surrounding area was reviewed using the planning enquiry systems of Kerry County Council. Search criteria were implemented to determine whether such projects or plans that would not be relevant to this study. This information was used to determine potential cumulative impacts from other plans / projects with the proposed project.

3.2.1. Geographical Information System

Atkins developed a Geographic Information System (GIS) under the Munster Bridges Term Maintenance Contract No. 3, to store all ecological data relating to the Munster bridges and to facilitate easy interrogation of data both within the dataset and spatially. The GIS was used during the assessment of the proposed works at Knockbrack Culvert using QGIS. This included the examination of the locations and boundaries of European sites within 15km of all structures and determination of surface water connectivity between structures and European sites, using the EPA's river network data.

3.3. Site Visit

A site visit was carried out by Atkins Ecologists Kevin Mc Caffrey and Sally O'Meara on the 30th of January 2024. The survey extended approximately 150m upstream and downstream of the works area.

Ecological survey methods were in general accordance with those outlined in the following documents: -

- *A Guide to Habitats in Ireland* (Fossitt, 2000).
- *Best Practice Guidance for Habitat Survey and Mapping* (Smith et al., 2011).
- *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes* (NRA, 2009)

Potential sensitive ecological receptors present within the survey area were recorded, including the presence of protected species and habitats or habitats that would support protected species. Any presence of non-native invasive species was also recorded; however, the survey was carried out outside of the survey period for non-native plant species.

3.3.1. Statement of Authority

This report was prepared by Kevin Mc Caffrey and peer reviewed by Paul O'Donoghue.

Kevin Mc Caffrey (Atkins Galway) has a BSc (Hons) in Applied Freshwater and Marine Biology and a MSc in Environmental Sustainability. He is a Senior Ecologist with over 10 years' experience in freshwater and marine ecology, environmental surveying, impact assessment and as an Ecological clerk of Works. He has prepared and reviewed a wide range of technical reports including Environmental Impact Assessment, AA screening, Natura Impact Assessment and sanitary surveys.

Paul O'Donoghue has a BSc (Zoology), MSc (Behavioural Ecology) and a PhD in avian ecology and genetics. Paul is a chartered member of the Society for the Environment (CEnv) and a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). Paul has over 18 years' experience in ecology; including extensive experience in the preparation of Habitat Directive Assessments / Natura Impact Statements (i.e. Appropriate Assessment under Article 6(3) of the EU Habitats Directive). Paul carried out the technical review of this report.

4. Existing Environment

4.1. Desktop Review

Knockbrack Culvert is located on the Fahavane stream (EPA name) – which is a tributary of the River Brick (EPA name). The River Brick is in turn a tributary of the River Feale which flows into the Shannon Estuary just south of Ballybunion. Water quality in the Brick River (IE_SH_23B030300) is defined as *Moderate* by the EPA in the area surrounding the bridge (River Waterbody WFD status 2016-2021; EPA Maps). Further downstream (7km) the status improves to *Good*, before dropping to *Poor* and the returning to *Moderate* before entering the River Feale. The River Brick’s Water Framework risk status is defined as being *At Risk*.

Knockbrack Culvert is not located within any European sites: - Lower River Shannon SAC (002165) is located 9.3km downstream of the culvert. Stack’s to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (004161) is located 370m south of the bridge, however, this is upstream of the proposed works.

There are no records of plant species listed on the 3rd Schedule of the Natural Habitats Regulations (SI 477/2011) from the bridge or works area as defined in Section 1.1 of this report, e.g. Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*) which are widespread in the freshwater catchment of the River Lee upstream of the works area. There are also no records of species such as Giant hogweed (*Heracleum mantegazzianum*) or Giant rhubarb (*Gunnera* sp.). There is one record of Japanese Knotweed 1.4 km northwest of the site, it is located on the Brick River upstream of its confluence with Fahavane stream.

In the immediate area of the proposed works the dominant habitat is Improved Agricultural Grassland (GA1), the banks of the river upstream and downstream of the bridge are a mix of Scrub (WS1) and Treeline (WL2). Upstream of the bridge there are areas of Annex I habitat - European Dry Heath [4030], Wet Heath [4010] and Blanket Bog [7130]. There is also a significant cover of Conifer Plantation (WD4). Downstream of the bridge (*circa* 18km) the Annex I habitat Estuaries is present on the River Feale (NPWS, 2019a). There are no proposed works in or in close proximity to any Annex I habitats.

White-clawed crayfish (*Austropotamobius pallipes*), Freshwater pearl mussel (*Magaritifera margaritifera*), are not recorded within the catchment. All three species of lamprey: Brook lamprey (*Lampetra planeri*), River Lamprey (*Lampetra fluviatilis*) and Sea Lamprey (*Petromyzon marinus*) are likely to occur within the catchment (NPWS,2019b).

There are no bats recorded within the proposed works area or in the immediate area (NBDC). [REDACTED] There are no Lesser horseshoe bat (*Rhinolophus hipposideros*) records in the area, [REDACTED].

NBDC has only three records of otters in the River Brick catchment, two of these are located more than 10km downstream of the proposed works. The other record is on the River Brick upstream of the confluence with the Fahavane stream. Given the wide-ranging nature of otters it is likely that they occur in the proposed works area.

4.2. Ecology Site Visit

The site visit was carried out on the 30/01/2024, on a dry overcast day. There were no access issues at the bridge and so the works area and 150m upstream and downstream of the site was surveyed.

There is an old disused bridge 15m upstream of the culvert, the riverbed between the two structures is mass concrete with training walls on both banks. The concrete has large cracks and has broken apart in places. Both banks are steep running back at a uniform slope. The banks are thickly vegetated with scrub and couple of small trees. Although the eastern bank has been cleared of vegetation to some extent. The old masonry bridge is constructed of tight-fitting stones with little space between. There are one or two small holes in the arch of the bridge, although these appear to be quite damp and so unlikely to be used by bats. The masonry bridge is heavily overgrown with vegetation mostly Ivy and some small trees. The mass concrete stops at the masonry bridge and from this point onwards the stream bed is a mix of bedrock and large cobbles with little to no silt or sand. There is a farm access track immediately upstream of the masonry bridge. The river bank is steep here with clear signs

of erosion during heavy rainfall. The river flow was quite low at the time of survey considering it was winter and had rained in the preceding weeks. It is likely the summer flows are very low and may even dry up during dry periods. Small burrows had been excavated in the eroded banks upstream, it is likely that these were excavated by the invasive species Bank Vole (*Myodes glareolus*) of which there are historic records in the area. No works are proposed in this area.

Downstream of the culvert the riverbed is also mass concrete. Approximately 5m from the culvert the slope of the river steepens significantly for approximately 10-15m. At which point there is a vertical drop of approximately 0.5m the natural riverbed of cobbles and bedrock continues from here. There are large concrete wingwalls leading away from the culvert on both banks. The vegetation on the west banks is a mix of treeline and scrub. While the eastern bank consists of a treeline with improved agricultural land behind.



Plate 4-1 View of Knockbrack Culvert looking downstream, scrub visible on the western bank.



Plate 4-2 Knockbrack Culvert downstream elevation.



Plate 4-3 Looking downstream from the culvert.



Plate 4-4 Looking upstream from the culvert.



Plate 4-5 Looking downstream from above the masonry bridge.

4.3. Consultation

Atkins engineers contacted Inland Fisheries Ireland (IFI) in December 2023 for input on the designs of the proposed works. IFI were happy with the proposed design but request a minor alteration. It was requested that a dish or deeper channel be constructed in the apron upstream of the culvert to aid fish passage through the structure. This alteration has been added to the design (see design drawings Appendix A).

5. Screening for Appropriate Assessment

5.1. Likelihood of Significant Effects on European Sites

The available information on European sites was reviewed to establish whether or not the proposed development is likely to have a significant effect on the conservation objectives of the designated sites. The likelihood of impacts on the qualifying interests of the European sites identified in this report is based on information collated from the desk study, site plans and other available existing information.

The likelihood of impacts occurring are established in light of the type and scale of the proposed works, the location of the proposed works with respect to European sites and the features of interest and conservation objectives of the European sites.

This report is prepared following the Cause – Pathway – Effect model. The potential impacts are summarised into the following categories for screening purposes.

- Direct impacts can refer to habitat loss or fragmentation arising from land-take requirements for development or agricultural purposes. Direct impacts can be as a result of a change in land use or management, such as the removal of areas of annexed habitats growing at or close to the bridge, or through direct impacts in aquatic species for which the European site has been designated. In the case of bridge repairs this could also result in temporary habitat loss or modification.
- Indirect and secondary impacts do not have a straight-line route between cause and effect. It is potentially more challenging to ensure that all the possible indirect impacts of the project – in combination with other plans and projects - have been established. These can arise, for example, when a development alters the hydrology of a catchment area, which in turn affects the movement of groundwater to a site and the qualifying interests that rely on the maintenance of water levels. Deterioration in water quality can occur as an indirect consequence of development, which in turn changes the aquatic environment and reduces its capacity to support certain plants and animals. The introduction of invasive species can also be defined as an indirect impact. Disturbance to fauna can arise directly through the loss of habitat (e.g. displacement of qualifying interest species) or indirectly through noise, vibration and increased activity associated with construction and operation.

5.2. Connectivity of Proposed Project to the European Sites

The 'zone of influence' (ZoI) for a project is the area over which ecological features may be subject to significant effects as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries. The zone of influence will vary for different ecological features depending on their sensitivity to an environmental change (CIEEM, 2019). Historically a distance of 15km was recommended as a potential zone of influence; this distance was derived from UK guidance (Scott Wilson *et al.*, 2006). This distance is also quoted in the DEHLG's *Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities* (DEHLG, 2009). However, in line with OPR (2021) European sites should be evaluated on a case-by-case basis with reference to the nature, size and location of the project, the sensitivities of the ecological receptors, and the potential for in-combination effects. In each case the Source-Pathway-Receptor framework should be used and not just an arbitrary distance such as 15 km.

Thus, given the nature, scale and extent of the proposed project, the potential zone of influence will consider European sites with regard to the location of a European site, the QIs of the site and their potential mobility outside that European site, the Cause-Pathway-Effect model and potential environment effects of the proposed project.

The culvert and proposed works site are not located within any SAC or SPA. There are five Special Areas of Conservation (SACs) and two Special Protection Areas (SPAs) located within the potential ZoI of the proposed project, as outlined in Table 5-1 and Table 5-2 below.

There is hydrological connectivity with Lower River Shannon SAC (002165). The Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (004161) is located upstream of Knockbrack culvert. A

small watercourse flows north from the SPA through the culvert and on to the Shanow River. This in turn flows north, becoming the River Brick / Lixnaw Canal, and joins the River Feale before it enters the Shannon Estuary.

Along with the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA, the remaining Natura 2000 sites are screened out from further consideration as: -

- They have no physical overlap, nor hydrological link between the works.
- Works are too remote for there to be a risk or the sites share a very remote connection.
- The proposed works are not predicted to pose a significant risk to the qualifying interests of these Natura 2000 sites.

Detailed screening explanations are presented in Table 5-1 and Table 5-2.

Table 5-1 SACs within potential Zol of the proposed project.

Site	Distance and direction of site from proposed works	Features of Interest	Screening comment
<p>Lower River Shannon SAC (002165)</p>	<p>5km north of the proposed works</p>	<ul style="list-style-type: none"> • Sandbanks which are slightly covered by sea water all the time [1110] • Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140] • Coastal lagoons [1150] • Large shallow inlets and bays [1160] • Reefs [1170] • Perennial vegetation of stony banks [1220] • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] • Salicornia and other annuals colonising mud and sand [1310] • Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330] • Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] • Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260] • <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410] • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0] • <i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029] • <i>Petromyzon marinus</i> (Sea Lamprey) [1095] • <i>Lampetra planeri</i> (Brook Lamprey) [1096] • <i>Lampetra fluviatilis</i> (River Lamprey) [1099] • <i>Salmo salar</i> (Salmon) [1106] • <i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349] • <i>Lutra lutra</i> (Otter) [1355] 	<p>There is hydrological connectivity between the works area and this SAC – further assessed in Chapter 6.0 Appropriate Assessment.</p>

Site	Distance and direction of site from proposed works	Features of Interest	Screening comment
Ballyseedy Wood SAC (002112)	8.7km to the south	<ul style="list-style-type: none"> Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) [91E0] 	<p>This site is not included in further assessment for the following reasons: -</p> <ul style="list-style-type: none"> Designated for one woodland habitat-type, which is not located at the proposed works area. No overlap – intervening distance of approximately 8.7km between proposed works site, the SAC and any woodland within it. Ballyseedy Wood SAC is located in the catchment of the River Lee. It is thus located in a different catchment, with no hydrological connectivity to the works area. No plausible pathway for any negative impacts to qualifying habitat within Ballyseedy Wood SAC.
Slieve Mish Mountains SAC (002185)	11km to the southwest	<ul style="list-style-type: none"> Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010] European dry heaths [4030] Alpine and Boreal heaths [4060] Blanket bogs (* if active bog) [7130] Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>) [8110] Calcareous rocky slopes with chasmophytic vegetation [8210] Siliceous rocky slopes with chasmophytic vegetation [8220] <i>Trichomanes speciosum</i> (Killarney Fern) [1421] 	<p>This site is not included in further assessment for the following reasons: -</p> <ul style="list-style-type: none"> Designated for a range of terrestrial habitats and terrestrial plant species, which are not located at the proposed works area. No overlap – intervening distance of approximately 11km between proposed works site, the SAC and any designated habitats within it. Located in a different catchment - no hydrological connectivity. No plausible pathway for any negative impacts to qualifying habitat or species within Slieve Mish Mountains SAC.
Tralee Bay and Magharees Peninsula, West to Cloghane SAC (002070)	10.4km to the southwest	<ul style="list-style-type: none"> Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] 	<p>This site is not included in further assessment for the following reasons: -</p>

Site	Distance and direction of site from proposed works	Features of Interest	Screening comment
		<ul style="list-style-type: none"> • Coastal lagoons [1150] • Large shallow inlets and bays [1160] • Reefs [1170] • Annual vegetation of drift lines [1210] • Perennial vegetation of stony banks [1220] • Salicornia and other annuals colonising mud and sand [1310] • Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330] • Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] • Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] • Dunes with <i>Salix repens</i> ssp. <i>argentea</i> (<i>Salicion arenariae</i>) [2170] • Humid dune slacks [2190] • Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410] • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0] • <i>Lutra lutra</i> (Otter) [1355] • <i>Petalophyllum ralfsii</i> (Petalwort) [1395] 	<ul style="list-style-type: none"> • No overlap between the works area and this SAC – intervening distance of approximately 10.4km between proposed works site and SAC. • Located in a different catchment - no hydrological connectivity. • No plausible pathway for any negative impacts to qualifying habitat or species within Tralee Bay and Magharees Peninsula, West to Cloghane SAC.
<p>Akeragh, Banna and Barrow Harbour SAC (000332)</p>	<p>13km to the west</p>	<ul style="list-style-type: none"> • Annual vegetation of drift lines [1210] • Salicornia and other annuals colonising mud and sand [1310] • Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330] • Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120] 	<p>This site is not included in further assessment for the following reasons: -</p> <ul style="list-style-type: none"> • No overlap between the works area and this SAC – intervening distance of approximately 13km between proposed works site and SAC. • Located in a different catchment - no hydrological connectivity. • No plausible pathway for any negative impacts to qualifying habitat or species

Site	Distance and direction of site from proposed works	Features of Interest	Screening comment
		<ul style="list-style-type: none"> • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] • Humid dune slacks [2190] • European dry heaths [4030] 	within Akeragh, Banna and Barrow Harbour SAC.

Table 5-2 SPAs within potential Zol of the proposed project.

Site	Distance and direction of site from proposed works	Features of Interest	Screening comment
<p>Tralee Bay Complex SPA (004188)</p>	<p>10.4km to the southwest</p>	<ul style="list-style-type: none"> • Whooper Swan (<i>Cygnus cygnus</i>) [A038] • Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] • Shelduck (<i>Tadorna tadorna</i>) [A048] • Wigeon (<i>Anas penelope</i>) [A050] • Teal (<i>Anas crecca</i>) [A052] • Mallard (<i>Anas platyrhynchos</i>) [A053] • Pintail (<i>Anas acuta</i>) [A054] • Scaup (<i>Aythya marila</i>) [A062] • Oystercatcher (<i>Haematopus ostralegus</i>) [A130] • Ringed Plover (<i>Charadrius hiaticula</i>) [A137] • Golden Plover (<i>Pluvialis apricaria</i>) [A140] • Grey Plover (<i>Pluvialis squatarola</i>) [A141] • Lapwing (<i>Vanellus vanellus</i>) [A142] • Sanderling (<i>Calidris alba</i>) [A144] • Dunlin (<i>Calidris alpina</i>) [A149] • Black-tailed Godwit (<i>Limosa limosa</i>) [A156] • Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] • Curlew (<i>Numenius arquata</i>) [A160] • Redshank (<i>Tringa totanus</i>) [A162] • Turnstone (<i>Arenaria interpres</i>) [A169] • Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] • Common Gull (<i>Larus canus</i>) [A182] • Wetland and Waterbirds [A999] 	<p>There is potential for some QI species to use farmland near the works for ex-situ feeding (Species in bold).</p> <p>However, the proposed works are a significant distance from the SPA (>10km).</p> <p>The works area is in cut and is also naturally screened from the surrounding farmland by the presence of thick vegetation on both banks. As such there will be limited potential for impact on foraging bird species. Therefore, this site can be screened out and will not be discussed further.</p>
<p>Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (004161)</p>	<p>370m south</p>	<ul style="list-style-type: none"> • Hen Harrier (<i>Circus cyaneus</i>) [A082] 	<p>The Stack's to Mullaghareirk Mountains SPA is an important breeding area for Hen Harrier. At its closest this is ca. 370m to the south.</p> <p>Arroyo <i>et al.</i> 2014 noted that breeding female Hen Harriers hunted mostly within 1 km from the</p>

Site	Distance and direction of site from proposed works	Features of Interest	Screening comment
			<p>nest and males mostly within 2 km. Favoured foraging habitat in moorland, mixed grassland mosaics and pre-thicket forest habitats. The habitats in the immediate environs of Knockbrack are dominated by improved agricultural grassland, as well as a small strip of woodland along the river valley. To the south lands are dominated by conifer plantation (WD4), as well as a mosaic of grassland, scrub and clearfell woodland. These latter areas offer suitable foraging habitat for Hen Harrier. Post-breeding birds often move to the coast and may hunt over neighbouring areas of saltmarsh.</p> <p>Although the works area is within 1km of suitable hunting habitat the habitat at the site and its immediate environs do not support high quality foraging areas of Hen Harrier</p> <p>Also as noted the works are located in an area of cut – in a small narrow valley surrounded by dense vegetation including trees. Works will therefore be screened from surrounding lands. An existing level of disturbance is also present due to the busy nature of the major road located above the works area and the surrounding active farmland.</p> <p>As suitable habitat for hunting is not present and potential disturbance will be naturally mitigated by the presence of thick vegetation and steep banks. Therefore, this site can be screened out and will not be discussed further.</p>

5.3. Brief Description of European Sites

5.3.1. Lower River Shannon SAC

The location of Knockbrack Culvert in relation to Lower River Shannon SAC is shown in Figure 5.1.

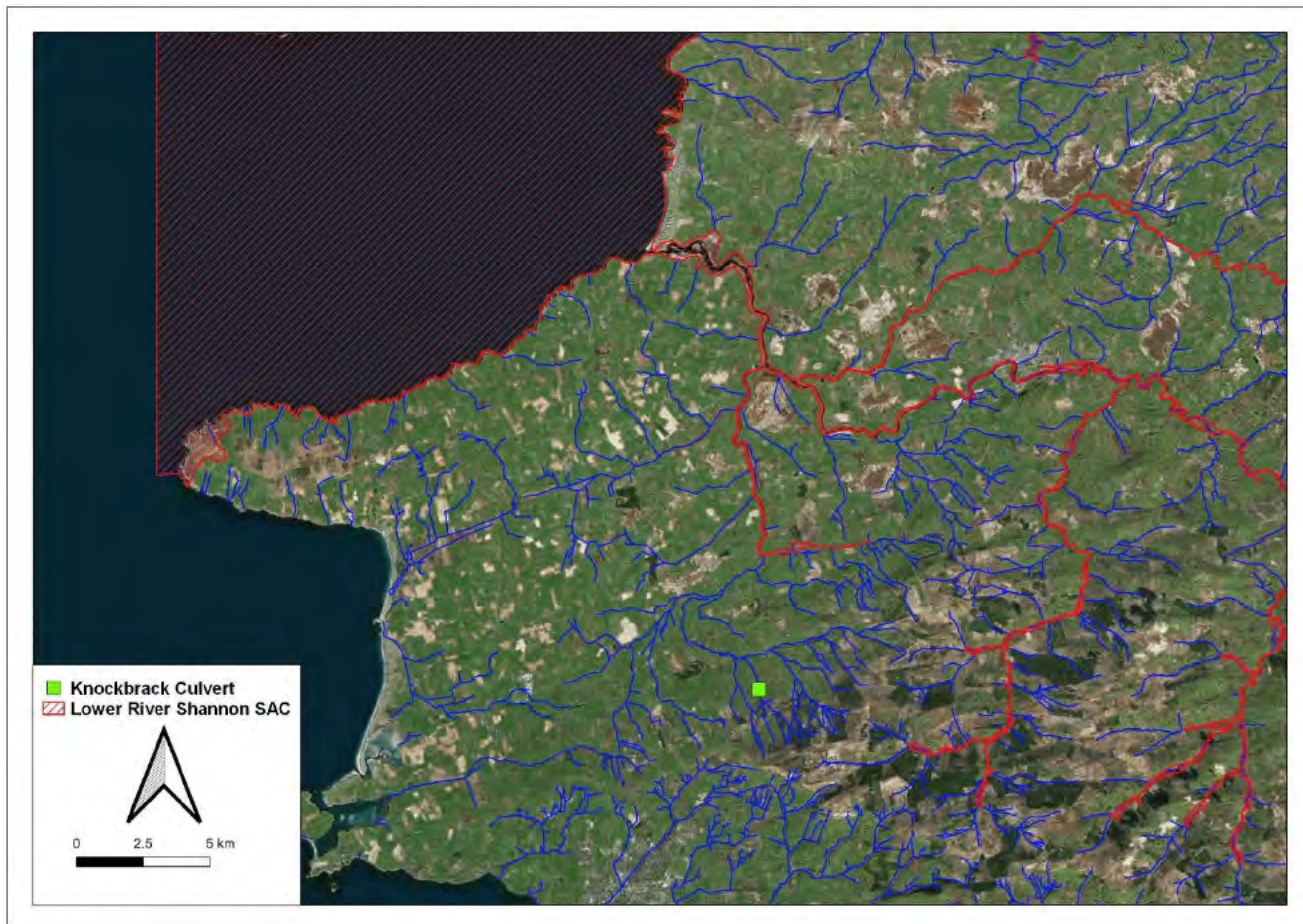


Figure 5.1 Knockbrack Culvert location in relation to the Lower River Shannon SAC.

The following description of the Lower River Shannon SAC is taken from the NPWS site synopsis (NPWS, 2013).

“This very large site stretches along the Shannon valley from Killaloe in Co. Clare to Loop Head/ Kerry Head, a distance of some 120 km. The site thus encompasses the Shannon, Feale, Mulkear and Fergus estuaries, the freshwater lower reaches of the River Shannon (between Killaloe and Limerick), the freshwater stretches of much of the Feale and Mulkear catchments and the marine area between Loop Head and Kerry Head. Rivers within the sub-catchment of the Feale include the Galey, Smearlagh, Oolagh, Allaughaun, Owveg, Clydagh, Caher, Breanagh and Glenacarney. Rivers within the sub-catchment of the Mulkear include the Killeenagarrieff, Annagh, Newport, the Dead River, the Bilboa, Glashacloonaraveela, Gortnageragh and Cahernahallia.

This site is of great ecological interest as it contains a high number of habitats and species listed on Annexes I and II of the E.U. Habitats Directive, including the priority habitats lagoon and alluvial woodland, the only known resident population of Bottle-nosed Dolphin in Ireland and all three Irish lamprey species. A good number of Red Data Book species are also present, perhaps most notably the thriving populations of Triangular Club-rush. A number of species listed on Annex I of the E.U. Birds Directive are also present, either wintering or breeding. Indeed, the Shannon and Fergus Estuaries form the largest estuarine complex in Ireland and support more wintering

wildfowl and waders than any other site in the country. Most of the estuarine part of the site has been designated a Special Protection Area (SPA), under the E.U. Birds Directive, primarily to protect the large numbers of migratory birds present in winter.”

5.3.1.1. Features of Interest

Lower River Shannon SAC is designated for the habitats and species as listed below: -

- Sandbanks which are slightly covered by sea water all the time [1110]
- Estuaries [1130]
- Mudflats and sandflats not covered by seawater at low tide [1140]
- Coastal lagoons [1150]
- Large shallow inlets and bays [1160]
- Reefs [1170]
- Perennial vegetation of stony banks [1220]
- Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]
- Salicornia and other annuals colonising mud and sand [1310]
- Atlantic salt meadows (*Glauco-Puccinellietalia maritima*) [1330]
- Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
- Water courses of plain to montane levels with the *Ranunculon fluitantis* and *Callitricho-Batrachion* vegetation [3260]
- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410]
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0]
- *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029]
- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra planeri* (Brook Lamprey) [1096]
- *Lampetra fluviatilis* (River Lamprey) [1099]
- *Salmo salar* (Salmon) [1106]
- *Tursiops truncatus* (Common Bottlenose Dolphin) [1349]
- *Lutra lutra* (Otter) [1355]

5.3.1.2. Conservation Objectives

The conservation objectives for the Lower River Shannon SAC (002165) and the list of site specific attributes and targets defining the conservation objectives are published in NPWS (2012). *Conservation Objectives: Lower River Shannon SAC 002165. Version 1.*

[\[https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf\]](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf).

The Habitats Directive defines when the conservation status of the listed habitats and species is considered as favourable. The definitions it uses for this are specific to the Directive. In summary, they require that the range and areas of the listed habitats, and the range and population of the listed species, should be at least maintained at their status at the time of designation. Site-specific conservation objectives aim to define favourable conservation conditions for a particular habitat or species at that site.

Article (1) of the Habitats Directive (92/43/EEC) describes favourable conservation conditions for habitats and species as follows: -

Favourable conservation status of a habitat is achieved when: -

- It's natural range, and area it covers within that range, are stable or increasing, and
- The Specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when: -

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its population on a long-term basis.

The conservation objectives for Lower River Shannon SAC are to Restore /or Maintain the favourable conservation condition of qualifying species and habitats of the SAC.

5.3.1.3. Potential Threats

Threats and pressures for the lower River Shannon SAC taken from the Standard Data Form for the site (EEA, 2018).

Table 5-3 Threat and pressures for Lower River Shannon SAC.

Threat code	Threat	Rank	Inside/Outside
I01	Invasive non-native species	Low	Inside
F03.01	Hunting	Low	Inside
B	Sylviculture, forestry	Low	Inside
H04	Air pollution, air-borne pollutants	Medium	Out
F01	Marine and Freshwater Aquaculture	Low	Inside
C01.01.02	Removal of beach materials	Low	Inside
A04	Grazing	Medium	Inside
J02.12.01	Sea defence or coast protection works, tidal barrages	Low	Inside
J02.01.02	Reclamation of land from sea, estuary or marsh	Medium	Out
D01.01	Paths, tracks, cycling tracks	Low	Inside
E01	Urbanised areas, human habitation	Medium	Out

Threat code	Threat	Rank	Inside/Outside
E03	Discharges	Medium	Out
G01.01	Nautical sports	Low	Inside
C01.03.01	Hand cutting of peat	Low	Inside
E03	Discharges	Medium	Inside
K02.03	Eutrophication (natural)	Medium	Out
J02.10	Management of aquatic and bank vegetation for drainage purposes	Low	Inside
A08	Fertilisation	Medium	Both
J02.01.01	Polderisation	Medium	Inside

5.3.1.4. Screening Comments

Due to the size and geographic range of the SAC, not all qualifying interests of the SAC are within the Zol of the proposed project. Given the location of Knockbrack Culvert and the nature and scale of the proposed works, the qualifying interests of the SAC that are within the Zol of the bridge works are summarised in Table 5-4.

Table 5-4 Screening of qualifying interests of Lower River Shannon SAC.

Qualifying Interests	Comment	Screening In
Sandbanks which are slightly covered by sea water all the time [1110]	NPWS mapped sandbanks are located in the mouth of the Shannon estuary. The Shannon estuary is 24km downstream of the works site, with the sandbanks a further 4.3km from the mouth of the River Feale. Given the significant distance to this habitat and its location within the Shannon estuary there is no potential for significant impact from the proposed works.	No
Estuaries [1130]	Estuary habitat within the Lower River Shannon SAC is located approximately 17km downstream of the proposed works site. While the proposed works are small in scale and are remote from the Lower River Shannon SAC, mitigation is required to ensure no negative impacts to water quality and this downstream habitat within the SAC.	Yes
Mudflats and sandflats not covered by seawater at low tide [1140]	This QI habitat occurs 20km downstream of the proposed work site within the Lower River Shannon SAC. While the proposed works are small in scale and are remote from the Lower River Shannon SAC, mitigation is required to ensure no negative impacts to water quality and this downstream habitat within the SAC.	Yes
Coastal lagoons [1150]	This habitat does not occur in the area and there is no hydrological connectivity between the proposed works area and this habitat. As such there is no potential for impact.	No
Large shallow inlets and bays [1160]	This QI habitat occurs 27km downstream of the proposed work site within the Lower River Shannon SAC. Given the significant distance between the proposed works site and this QI it	No

Qualifying Interests	Comment	Screening In
	is unlikely that a significant impact would occur due to the proposed works.	
Reefs [1170]	This QI habitat occurs 27km downstream of the proposed work site within the Lower River Shannon SAC. Given the significant distance between the proposed works site and this QI it is unlikely that there would be a significant impact due to the works.	No
Perennial vegetation of stony banks [1220]	This habitat does not occur in the area and there is no hydrological connectivity between the proposed works area and this habitat as it occurs above the water line. As such there is no potential for impact.	No
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	This habitat does not occur in the area and there is no hydrological connectivity between the proposed works area and this habitat. As such there is no potential for impact.	No
<i>Salicornia</i> and other annuals colonising mud and sand [1310]	Records for this QI are not available for River Feale estuary; however, muddy and sandy habitats occur and so this QI could be present. The closest to the proposed works the QI could be present is 17km. While the proposed works are small in scale and are remote from the Lower River Shannon SAC, mitigation is required to ensure no negative impacts to water quality and this downstream habitat within the SAC.	Yes
Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>) [1330]	This habitat occurs 20km downstream of the proposed works site. Given the location of this habitat above the water line and considering the distance from the works it is considered unlikely that there would be a significant impact due to the proposed works.	No
Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]	This habitat occurs 21.5km downstream of the proposed works site. Given the location of this habitat above the water line and considering the distance from the works it is considered unlikely that there would be a significant impact due to the proposed works.	No
Water courses of plain to montane levels with the <i>Ranunculon fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260]	It is likely that this habitat occurs in the River Brick. While the proposed works are small in scale and are remote from the Lower River Shannon SAC, mitigation is required to ensure no negative impacts to water quality and this downstream habitat within the SAC.	Yes
<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410]	This habitat does not occur in the immediate area and there is no hydrological connectivity with the proposed works. As such there is no potential for impact due the works.	No
Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) [91E0]	This habitat does not occur in the immediate area and there is no hydrological connectivity with the proposed works. As such there is no potential for impact due the works.	No
<i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]	This species does not occur in this catchment and there is no hydrological connectivity to an	No

Qualifying Interests	Comment	Screening In
	area which they are present. As such there is no potential for impact.	
<i>Petromyzon marinus</i> (Sea Lamprey) [1095] <i>Lampetra planeri</i> (Brook Lamprey) [1096] <i>Lampetra fluviatilis</i> (River Lamprey) [1099]	These species are likely to occur in the catchment. While the proposed works are small in scale and are remote from the Lower River Shannon SAC, mitigation is required to ensure no negative impacts to water quality and this downstream habitat within the SAC.	Yes
<i>Salmo salar</i> (Salmon) [1106]	This species occurs in the catchment. While the proposed works are small in scale and are remote from the Lower River Shannon SAC, mitigation is required to ensure no negative impacts to water quality and this downstream habitat within the SAC.	Yes
<i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349]	This species occurs in the Shannon estuary, but not likely to enter the River Feale estuary. While the proposed works are small in scale and are remote from the Lower River Shannon SAC, mitigation is required to ensure no negative impacts to water quality and this downstream habitat within the SAC.	No
<i>Lutra lutra</i> (Otter) [1355]	This has been recorded in the River Brick and could occur in the vicinity of the works. While the proposed works are small in scale and are remote from the Lower River Shannon SAC, mitigation is required to ensure no negative impacts to water quality and this downstream habitat within the SAC.	Yes

In summary, only the following nine qualifying interests are within the zone of influence and thus must be considered further with respect to the proposed works: -

- Estuaries [1130]
- Mudflats and sandflats not covered by seawater at low tide [1140]
- Salicornia and other annuals colonising mud and sand [1310]
- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation [3260]
- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra planeri* (Brook Lamprey) [1096]
- *Lampetra fluviatilis* (River Lamprey) [1099]
- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]

These are discussed further in Chapter 6.0 – Appropriate Assessment.

5.4. Concluding Statement

The proposed works are not within any natura 2000 sites. However, they are in close proximity to Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA and there is hydrological connectivity with the Lower River Shannon SAC.

This screening report for Appropriate Assessment is based on the best available scientific information. It is concluded potential impacts on Lower River Shannon SAC cannot be fully discounted without the use of appropriately designed environmental protection / mitigation measures. Thus, it is recommended that the proposed project to proceed to Stage 2 of the Appropriate Assessment process. Potential for negative impacts to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA have been discounted and this site is not considered further.

6. Appropriate Assessment

This section of the report assesses the Lower River Shannon SAC in more detail and examines whether likely significant effects may arise. Where effects are identified that may affect the integrity of the European sites, avoidance and mitigation measures are proposed to offset these effects.

6.1. Identification of potential impacts

6.1.1. Do nothing

There is significant cracking and undermining of the concreted riverbed at Knockbrack culvert. If the issues were not to be repaired this would continue to deteriorate and cause structural issues to the remaining concrete apron and potentially the Knockback culvert itself. This would result in more significant works being required further down the line which would have a higher potential of ecological impact. There is also a public health and safety risk if the structural integrity of the culvert was to be compromised.

6.1.2. Lower River Shannon SAC

The proposed works are described in full in Section 1.3 of the Report. As noted, works are expected to take – ca. 16 weeks to complete. Ideally works will occur during the summer months, during periods of lower river flow and drier weather conditions, but depending upon timing the works may extend further into the autumn, (but not outside the fishery open season which ends at the end of September without a derogation from IFI).

There will be no permanent loss of habitat as the works will be restricted to removal and replacement/repair of the existing concrete apron. The only screened in QI habitat that occurs within rivers is Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation [3260]. However, based on the site visit, this habitat does not occur within the works area or its immediate environs, and is not likely to occur immediately upstream of downstream due to the spating/ephemeral characteristics of the stream.

In the absence of appropriate mitigation, there is the potential for the mobilisation of sediment into the stream during breaking out and excavation of the existing apron and training wall. The embankment immediately behind the training wall will also require excavation to allow for the installation of the new training walls. Release of sediment to the watercourse can negatively impact on aquatic species and habitats. The main impacts are associated with sediment release included changes to flow characteristics, reduced water quality, loss of spawning habitat, increased vegetation growth and reduction in prey availability.

Concrete and cementitious grout will be required for the maintenance works. Release of wet cement-based products to the watercourse could also cause negative impacts to the immediate or downstream environment. Impacts could include reduce water quality (e.g. through changes to pH), permanent loss of habitat, fish kills, reduction of prey species and loss of spawning habitat. Given the large volume of concrete required in the absence of mitigation measures there is significant potential impact.

The proposed traffic diversion routes also lies outside the Lower River Shannon SAC boundaries.

The Lower River Shannon SAC is also designated for Otter. While no direct impact to a holting site is predicted, there is potential for the disturbance of Otter during proposed construction works or indirect impacts through negative impacts to water quality or associated aquatic ecology. This is returned to under Mitigation below.

6.2. Mitigation Measures

This section describes the mitigation measures required to ensure there are no residual effects on the integrity of the European site.

6.2.1. Requirement and Approach

Section 5 of this NIS found that, in the absence of appropriate mitigation, the proposed works have the potential to adversely affect the conservation objectives for a number of qualifying interests of the Lower River Shannon SAC. The potential for such effects arises due to the risk of water quality impacts associated with the works. This section prescribed mitigation measures to address these impacts and, thereby, eliminate the possibility of adverse effects.

The development of the mitigation measures prescribed in this section has followed the “mitigation hierarchy”, which prioritises avoidance over reduction, and actions at source over pathway over receptor, as follows: -

1. Eliminate the source of the impact.
2. Minimise or reduce the impact at its source.
3. Block or weaken the pathway for effects.
4. Abate effects at the receptor.

This approach assists with more complete removal of the effects, minimises the risk of effects occurring by less obvious pathways, also protects non-target receptors, and minimises the risks of unintended harm associated with measures focussed at or near the receptors.

6.2.2. General Measures

1. Cumnor’s ecologist will monitor the installation of and performance of mitigation measures and issue reports on said performance after each site visit.
2. All site staff will be informed of environmental best practice methodologies to be employed on site via the dissemination of a tool-box talk. This shall include the requirement for protection of aquatic habitats, as well as the sensitivity of the downstream SAC.
3. A Temporary Traffic Management zone will be created within the road corridor. This shall be used for parking and deliveries of materials. This is set out in Section 1.3.1.
4. Works will be carried out during day-time hours, except in the event of an emergency. Work will take 16 days to complete.
5. Refuelling of vehicles and machinery will only be carried out on an impermeable surface in the assigned site compound (in carpark at southeast corner of bridge) and in an area well away from any watercourse or drainage (at least 20m). Spill trays to be used when refuelling.
6. Drip trays will be placed underneath any standing machinery to prevent pollution by oil/fuel leaks.
7. Emergency spill kits will be available on site and staff will be trained in their use. A reporting system will be established on site to record accidents and/or spillages on site and the resultant action taken to remedy the incident.
8. Any chemical, fuel and oil stores will be located on an impervious base within a secured bund with a storage capacity 110% of the stored volume.

9. Operators will check all equipment, machinery and vehicles on a daily basis before starting work to confirm the absence of leakages. Any leakages should be reported immediately and addressed.
10. Daily checks will be carried out and records kept on a weekly basis and any items that have been repaired/replaced/rejected noted and recorded. Any items of plant machinery found to be defective will be removed from site immediately or positioned in a place of safety until such time that it can be removed. All items of plant will be checked prior to use before each shift for signs of wear/damage.
11. No invasive species were recorded in the vicinity of the works area.
12. Biodegradable oils and fuels will only be used.
13. When entering the stream, and when leaving the, all operatives must wash down their wellingtons / waders and any tools that come into contact with the water with active Virkon Aquatic. This will avoid the risk of any cross contamination when working on other bridges in other areas.
14. Operatives to be made familiar with Inland Fisheries Ireland Biosecurity Protocol 2010 prior to commencing the works to ensure all guidelines are followed.

General Precautions

The following overarching measures shall apply to the construction phase: -

1. All works shall be undertaken within the agreed site boundary. No works shall be undertaken outside the site boundary.
2. As part of site induction, all persons entering the works area shall receive a 'tool-box talk' covering the environmental and ecological sensitivities of the site and the measures being implemented to avoid and minimise impacts on those sensitivities, as well as the responsibilities of persons on site in implementing those measures.

Water Quality

The following measures shall apply to prevent water quality impacts generally: -

1. During all stages of construction, site management shall ensure that good housekeeping is maintained at all times and that all site personnel are made aware of the importance of the freshwater environments and the requirement to avoid pollution.
2. Safe handling of all potentially hazardous materials will be emphasised to all site personnel.
3. Tools and equipment shall not be cleaned in any watercourse and wash water shall not be discharged directly into any watercourse or road drains without appropriate treatment.
4. The Contractor shall make daily checks for elevated water levels/flows in the stream and weather warnings or flood alerts from Met Éireann and Cork County Council.
 - a. Should water levels in the river or overland flows pose a risk of overwhelming water quality control measures, or a weather warning for extreme rainfall or a flood alert covering County Cork be in place: -
 - i. All areas of exposed soil shall be securely covered with hessian matting,
 - ii. All stockpiles shall also be securely covered, and
 - iii. Works carrying the greatest risk of pollution shall be suspended and all vehicles, plant, equipment, construction materials and personnel shall be removed from the flood zone.

- b. Works may resume once any flood waters have receded and any warning/alert been lifted.

In addition, the measures in the following sub-sections shall apply to control the risk of water quality impacts from specific sources.

Run-off

The following measures shall be implemented to minimise the quantity of surface water run-off from the works area⁵ entering the river, and to minimise any potential contamination of such run-off by fine sediment or other deleterious matter: -

1. Where possible, run-off from outside of the works area shall be intercepted before entering the works area and diverted around it.
2. Stockpiles shall not be located within 20m of any watercourse and any stockpiles left overnight shall be covered.

Hydrocarbons

The following measures shall be implemented to control the risk of pollution from hydrocarbons, including fuels, hydraulic oils etc. on site: -

1. Storage of any fuels, oils and other hydrocarbons on site shall be in secure tanks/containers banded to 110% capacity.
2. Refuelling shall not be permitted within 20m of any watercourse.
3. All vehicles, plant, equipment etc. shall: -
 - a. Be free of any mechanical defects, and be well maintained so as to prevent fuel or oil leaks,
 - b. Be mechanically sound and checked before arriving on site,
 - c. Not be left idling when not in use, and
 - d. Be parked/stored on drip trays overnight.
4. Driving on site and shall be kept to a minimum.
5. All site personnel shall be familiar with their responsibilities under the ERP. In particular: -
 - a. All construction personnel shall be trained in the use of the spill containment/pollution control kits which will be kept on site.
 - b. Any spillage of fuels, lubricants or hydraulic oils shall be immediately contained and a pollution control kit used. The contaminated soil shall be removed off site and properly disposed of.
 - c. Any spillage of fuels, lubricants or hydraulic oils, shall be reported immediately to the ECoW.
6. Additional drip trays and spill kits shall be accessible from the storage container.

Concrete

The following measures shall be implemented to prevent contamination of surface waters by concrete or other cementitious materials: -

⁵ In this section, the "works area" includes the site compound, stockpiles and temporary settlement pond.

1. Within the dry works area created by sealed sandbags shuttering shall be used to contain the wet concrete and blinding as appropriate. These works will be contained within the dry works area created by large sandbags.
2. Where concrete is to be delivered by pipe to the working area – the pipe will be fitted with an emergency cut-off and pumping will be supervised by an operative at the truck at all times.
3. Concrete lorries shall not be permitted to wash out on site.

Invasive Alien Species

The following biosecurity measures shall be implemented to control risks from aquatic invasive alien species and pathogens: -

1. In-stream works shall be restricted to those described in Section 1. No other access into watercourses shall be permitted for plant, equipment or personnel.
2. The 'toolbox talk' for all persons entering the site shall include an overview of aquatic invasive alien species and pathogens, the importance of preventing their spread, and the responsibilities of site staff in avoiding any such spread.
3. Equipment, tools or PPE shall be treated using a combination of *Check, Clean and Dry* protocol as recommended by both NPWS and IFI and Virkon Aquatic or equivalent disinfectant before and after contact with the Allow River and any other watercourse (refer to Section 5.2).
4. The ECoW shall carry out weekly checks for compliance with the aquatic biosecurity measures.

6.2.3. Ecological Supervision

The Contractor shall retain the services of a suitably qualified and experienced Ecological Clerk of Works (ECoW) for the duration of the works.

The qualifications and experience of the ECoW shall include, as a minimum: -

- BSc (Hons) or above in Ecology or a related environmental discipline.
- Full membership of the CIEEM or equivalent membership of a similar professional body.
- Demonstrable experience in providing ecological/environmental oversight on construction sites, including sites where IAPS and sensitive watercourses are present.

The main duties of the ECoW shall include the following: -

1. Assist the Contractor in ensuring that the measures in this NIS, any conditions of consents/licences and relevant TII guidelines are fully and properly implemented during construction.
2. Undertake pre-construction surveys for legally restricted IAPS, as well as a recheck of the site for protected species or nesting birds. Should any third schedule invasive species be recorded the ECoW will prepare an invasive species management plan for the work site.
3. Directly supervise key activities on site, including setting out of water control measures.
4. Carry out inspections of the site and document the implementation of the measures in this NIS, any conditions of consents/licences and relevant TII guidelines. The ECoW's records shall be available to TII or TII's Representative, the NPWS and IFI, on request.
5. Provide updates to TII or TII's Representative on the implementation of the mitigation measures detailed in this NIS and any ecological/environmental incidents on site.

6.2.4. Biosecurity Measures

This will utilise the *Check, Clean and Dry* protocol as recommended by both NPWS and IFI. Full details of this approach are set out in Invasives Species Ireland webpage⁶. This will be done at the Contractor's main compound before any equipment is brought on site and again after completion of works before any equipment is moved to and used in a different watercourse.

NPWS summarise this approach as follows⁷: -

Check, Clean and Dry protocol: Check, clean and thoroughly dry equipment and clothing that comes in contact with the water before using again. If everything cannot be dry for at least 48 hours before re-entering the water, then disinfect it.

- CHECK your gear, footwear and watercraft after leaving the water for mud, aquatic animals, or plant material. Remove anything you find and leave it at the site.
- CLEAN everything thoroughly as soon as you can. Pay particular attention to nets, waders, and areas that are damp and hard to inspect. If possible, use hot water (at least 45°C) or a high-pressure spray.
- DRY all equipment and clothing until dry for at least 48 hours – some species can live for many days or weeks in moist conditions.
- Where any further disinfection is required while on site, Virkon spray will also be used on any plant, PPE or tools in or near the watercourse.

⁶ <https://invasives.ie/biosecurity/check-clean-dry/>

⁷ From - <https://www.gov.ie/en/press-release/43bfd-water-users-urged-to-take-precautions-due-to-outbreak-of-crayfish-plague-in-the-munster-blackwater-catchment/>

6.3. Residual Impacts

6.3.1. Lower River Shannon SAC

6.3.1.1. Habitats

Table 6-1 to Table 6-4 summarises the potential for impacts to screened in habitats of the Lower River Shannon SAC assuming the implementation of Mitigation measures, which have been integrated into the design of how works will be undertaken.

Table 6-1 Attributes of 1130 Estuaries and comments on potential for impact (from NPWS, 2012).

1130	Estuaries		
To maintain the favourable conservation condition of Estuaries in the Lower River Shannon SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Comment
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. (See Map 4 of NPWS, 2012).	There will be no loss of habitat as a result of the works. The proposed works are 17km upstream of estuary habitat. The habitat does not occur within the area and so there will be no impact on habitat area.
Community distribution	Hectares	Conserve the following community types in a natural condition: Intertidal sand to mixed sediment with polychaetes, molluscs and crustaceans community complex; Estuarine subtidal muddy sand to mixed sediment with gammarids community complex; Subtidal sand to mixed sediment with <i>Nucula nucleus</i> community complex; Subtidal sand to mixed sediment with <i>Nephtys</i> spp. community complex; Furoid-dominated intertidal reef community complex; Faunal turf-dominated subtidal reef community; and Anemone-dominated subtidal reef community. See map 9	Given the mitigation measures listed above (works to be carried out in the dry) and the significant distance to the estuary habitats (17km) there is no likely significant impact on the listed community types.

Table 6-2 Attributes of 1140 Mudflats and sandflats not covered by seawater at low tide and comments on potential for impact (from NPWS, 2012).

1140	1140 Mudflats and sandflats not covered by seawater at low tide		
To maintain the favourable conservation condition of 1140 Mudflats and sandflats in Lower River Shannon SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Comment
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. (See Map 5 of NPWS, 2012).	There will be no loss of habitat as a result of the works. The proposed works are 20km upstream of mudflat or sandflat habitat. The habitat does not occur within the area and so there will be no impact on habitat area.
Community distribution	Hectares	Conserve the following community types in a natural condition: Intertidal sand with <i>Scolecopsis squamata</i> and <i>Pontocrates</i> spp. community; and Intertidal sand to mixed sediment with polychaetes, molluscs and crustaceans community complex. (See map 9 of NPWS, 2012).	Given the mitigation measures listed above (works to be carried out in the dry) and the significant distance to the estuary habitats (17km) there is no likely significant impact on the listed community types.

Table 6-3 Attributes of 1310 Salicornia and other annuals colonising mud and sand, and comments on potential for impact (from NPWS, 2012).

1310	1310 Salicornia and other annuals colonising mud and sand		
To maintain the favourable conservation condition of Salicornia and other annuals colonising mud and sand in Lower River Shannon SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Comment
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Carrigafoyle - 0.005ha; Inishdea, Owenshere - 0.003ha; Knock - 0.029ha; Querin - 0.185ha; Rinevilla Bay - 0.001ha. (See map 12 of NPWS, 2012).	There will be no loss of habitat as a result of the works. The proposed works are 17km upstream of suitable habitat. The habitat does not occur within the area and so there will be no impact on habitat area.
Community distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes. See map 12 for known distribution	There will be decline or change to habitat distribution as a result of the works. The proposed works are 17km upstream of suitable habitat. The habitat does not occur within the area and so there will be no impact on habitat area.
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain natural circulation of sediments and organic matter, without any physical obstructions	The works are located 17km upstream of areas where this habitat could form. As such none of the planned works could impact on the circulation of sediments or organic matter.

Attribute	Measure	Target	Comment
Physical structure: creeks and pans including erosion and succession	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	Creek and pan structures form in marshes, no marsh habitat occurs in the works area as such there can be no impact on this conservation objective.
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	This objective is in relation to tidal regime there will be no impact on tidal regime due to this project.
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Given the mitigations measures listed above and the distance to this habitat (17km) there is no likely significant impact on the range of coastal habitats.
Vegetation structure: vegetation height	Centimeters	Maintain structural variation within sward	Given the mitigations measures listed above and the distance to this habitat (17km) there is no likely significant impact on vegetation height.
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	Given the mitigations measures listed above and the distance to this habitat (17km) there is no likely significant impact on vegetation cover.
Vegetation composition: typical species and sub-communities	Percentage cover	Maintain the presence of species-poor communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009)	Given the mitigations measures listed above and the distance to this habitat (17km) there is no likely significant impact on the percentage cover of species or sub communities.
Vegetation structure: negative indicator species- <i>Spartina anglica</i>	Hectares	No significant expansion of common cordgrass (<i>Spartina anglica</i>), with an annual spread of less than 1%	Due to the nature and location of the works there is no potential for impact on expansion of common cordgrass.

Table 6-4 Attributes of 3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation, and comments on potential for impact (from NPWS, 2012).

3260	3260 Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation		
To maintain the favourable conservation condition of 3260 Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation in Lower River Shannon SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Comment
Habitat area	Kilometres	Area stable or increasing, subject to natural processes	There will be no loss of habitat as a result of the works. The Fahavane stream is a spating river in the area surrounding the works and so is not suitable for this habitat type. Given the mitigation measures listed above (works to be carried out in the dry) there is no likely significant impact of the area of this habitat further downstream.
Habitat distribution	Occurrence	No decline, subject to natural processes. (See map 13 of NPWS, 2012).	There will be no impact on the occurrence of habitat as a result of the works. The Fahavane stream is a spating river in the area surrounding the works and so is not suitable for this habitat type. Given the mitigation measures listed above (works to be carried out in the dry) there is no likely significant impact on the occurrence of this habitat further downstream.
Hydrological regime: river flow	Metres per second	Maintain appropriate hydrological regimes	The section of river will be dammed for the works and the water pumped through. There may be a change to river flow, however, this will be very minor and temporary. The works are to be carried out during the summer when the stream is likely to have a very low flow. The site was visited during winter and flow levels were low. There is no likely significant impact on this objective due to the works
Hydrological regime: tidal influence	Daily water level fluctuations - metres	Maintain natural tidal regime	This objective refers to tidal regime, the planned works will not impact on tidal regime.
Hydrological regime: freshwater seepages	Metres per second	Maintain appropriate freshwater seepage regimes	The planned works will not impact on seepage regimes.
Substratum composition: particle size range	Millimetres	The substratum should be dominated by the particle size ranges, appropriate to the habitat sub-type (frequently sands, gravels and cobbles)	The Fahavane stream is a spating river in the area surrounding the works and so is not suitable for this habitat type. The works will be carried out in the dry and so eliminating the potential for sediment release. Concrete works relate to repair or replacement of existing concreted areas and so there will be no change substratum composition post works.

Attribute	Measure	Target	Comment
Water quality: nutrients	Milligrammes per litre	The concentration of nutrients in the water column should be sufficiently low to prevent changes in species composition or habitat condition	The planned works are to be carried out in the dry as such this eliminates the potential for release of sediment during the works. There are no other sources of nutrients associated with the works.
Vegetation composition: typical species	Occurrence	Typical species of the relevant habitat sub-type should be present and in good condition	The Fahavane stream is a spating river in the area surrounding the works and so is not suitable for this habitat type. Given the mitigation measures listed above (works to be carried out in the dry) there is no likely significant impact on the vegetation composition further downstream.
Floodplain connectivity	Area	The area of active floodplain at and upstream of the habitat should be maintained	The stream in the area of the works is fast flowing and no floodplain is present. There will be no impact on floodplain connectivity.
Riparian habitat	Area	The area of riparian woodland at and upstream of the bryophyte-rich sub-type should be maintained	There is no riparian woodland to be removed or impacted on as a result of the planned works.

It is not anticipated that the proposed works will negatively impact upon the qualifying habitats of Lower River Shannon SAC.

6.3.1.2. Species

Table 6-5 to Table 6-8 summarises the potential for impacts to all screened in species assuming the implementation of Mitigation measures, which have been integrated into the design of how works will be undertaken.

Table 6-5 Attributes of 1095 Sea Lamprey *Petromyzon marinus*, and comments on potential for impact (from NPWS, 2012).

1095	1095 Sea Lamprey <i>Petromyzon marinus</i>		
To restore the favourable conservation condition of 1095 Sea Lamprey <i>Petromyzon marinus</i> in Lower River Shannon SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Comment
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary	The section of river of the proposed works will be dammed during the works. This will create a barrier within the river however it will be temporary for the duration of the works. The works are two existing concreted areas and as such do not contain suitable habitats for Lamprey.
Population structure of juveniles	Number of age/size groups	At least three age/size groups present	The planned works are to be carried out in the dry, with the section of river being dammed and dewatered. IFI will be informed prior to works and if deemed necessary the area will be electrofished prior to dewatering. The works will not impact on this objective.
Juvenile density in fine sediment	Juveniles/m ²	Juvenile density at least 1/m ²	There are no fine sediments suitable for Juvenile lamprey in the works area. Due to the above listed mitigation measures, there is no likely significant impact on downstream habitats.
Extent and distribution of spawning habitat	m ² and occurrence	No decline in extent and distribution of spawning beds	There will be no change to the available habitats within the works area as all works are to the replacement or repair of existing concreted areas.
Availability of juvenile habitat	Number of positive sites in 3rd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive	As the planned works are to be carried out in the dry there is no likely significant impacted on downstream habitats expected.

Table 6-6 Attributes of 1096 Brook Lamprey *Lampetra planerii* 1099 River Lamprey *Lampetra fluviatilis*, and comments on potential for impact (from NPWS, 2012).

1096/1099	1096 Brook Lamprey <i>Lampetra planerii</i> 1099 River Lamprey <i>Lampetra fluviatilis</i>		
To maintain the favourable conservation condition of 1096 Brook Lamprey <i>Lampetra planerii</i> 1099 River Lamprey <i>Lampetra fluviatilis</i> in Lower River Shannon SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Comment
Distribution	% of river accessible	Access to all water courses down to first order streams	The section of river of the proposed works will be dammed during the works. This will create a barrier within the river however it will be temporary for the duration of the works. The works are two existing concreted areas and as such do not contain suitable habitats for Lamprey.
Population structure of juveniles	Number of age/size groups	At least three age/size groups of brook/river lamprey present	The planned works are to be carried out in the dry, with the section of river being dammed and dewatered. IFI will be informed prior to works and if deemed necessary the area will be electrofished prior to dewatering. The works will not impact on this objective.
Juvenile density in fine sediment	Juveniles/m ²	Mean catchment juvenile density of brook/river lamprey at least 2/m ²	There are no fine sediments suitable for Juvenile lamprey in the works area. Due to the above listed mitigation measures, there is no likely significant impact on downstream habitats.
Extent and distribution of spawning habitat	m ² and occurrence	No decline in extent and distribution of spawning beds	There will be no change to the available habitats within the works area as all works are to the replacement or repair of existing concreted areas.
Availability of juvenile habitat	Number of positive sites in 2 nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive	As the planned works are to be carried out in the dry there is no likely significant impact on downstream habitats expected.

Table 6-7 Attributes of 1106 Atlantic Salmon *Salmo salar* (only in fresh water), and comments on potential for impact (from NPWS, 2012).

1106	1106 Atlantic Salmon <i>Salmo salar</i> (only in fresh water)		
To maintain the favourable conservation condition of 1106 Atlantic Salmon <i>Salmo salar</i> (only in fresh water) in Lower River Shannon SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Comment
Distribution: extent of anadromy	% of river accessible	100% of river channels down to second order accessible from estuary	The section of river of the proposed works will be dammed during the works. This will create a barrier within the river however it will be temporary for the duration of the works. The works are two existing concreted areas and as such do not contain suitable habitats for Salmon.
Adult spawning fish	Number	Conservation Limit (CL) for each system consistently exceeded	The works are to be carried out during the summer as such there will be no impact on numbers of spawning adults in winter. The existing structure is likely to act as a barrier to Salmon due to the steep concrete slope downstream of the culvert (very little water even in winter) with a drop off at the end.
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling	There are no suitable spawning habitats within the works area as it is entirely concreted and the structure itself is likely to act as a barrier to upstream spawning. Due to the above listed mitigation measures no likely significant impact on fry abundance is expected downstream.
Out-migrating smolt abundance	Number	No significant decline	There are no suitable spawning habitats within the works area as it is entirely concreted and the structure itself is likely to act as a barrier to upstream spawning. As such smolts are not likely to occur upstream of the works area.
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes	There is no suitable habitat for redds in the works area as it is entirely concreted. Due to the mitigation measures listed above there is no likely significant impact on occurrence or number of redds downstream of the works.
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA	Due to the mitigation measures listed above there is no likely significant impact on water quality downstream of the works.

Table 6-8 Attributes of Otter (*Lutra lutra*) and comments on potential for impact (from NPWS, 2012).

1355	Otter (<i>Lutra lutra</i>)		
To restore the favourable conservation condition of Otter in Lower River Shannon SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Comment
Distribution	Percentage positive survey sites	No significant decline	There are no records of otter on the Fahavane stream and although some mammal tracks were recorded during the site visit there was no evidence that these were from otters. No spraints were recorded and no holts or couches within 150m upstream or downstream of the culvert. The proposed works are temporary (16 weeks) and are to be carried out during day-time hours. As such there is not expected to be any disturbance impact on otters.
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 596.8ha above high water mark (HWM); 958.9ha along river banks/around lakes and ponds	There will be no loss of terrestrial habitat due to the works. A small area behind the training wall will be excavated to allow installation of the new training wall. The bank will be reinstated post installation.
Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 4,461.6ha	There are no marine habitats in the works area.
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 500.1km	There will be no loss of river habitat associated with the works as planned works only include repair and replacement of existing concrete areas.
Extent of freshwater (lake/lagoon) habitat	Hectares	No significant decline. Area mapped and calculated as 125.6ha	There is no lake or lagoon habitat near the works area.
Couching sites and holts	Number	No significant decline	No couching sites or holts were recorded within 150m of the works area.
Fish biomass available	Kilograms	No significant decline	IFI will be informed prior to works and if deemed necessary the area will be electrofished prior to dewatering. Due to the above listed mitigation measures (works to be carried out in the dry) no likely significant impact is expected downstream of the works.
Barriers to connectivity	Number	No significant increase. For guidance (see Map 17)	This refers to barriers within the SAC which the proposed works are not in. The Fahavane stream will be dammed upstream and downstream of the works area. There is sufficient river bank between the cofferdams and the culvert or disused bridge to allow access to otter upstream or downstream.

It is not anticipated that the proposed works will negatively impact upon the qualifying species of Lower River Shannon SAC.

6.4. Potential In-Combination Impacts

6.4.1. Plans

The proposed development is located in the townland of Kockbrack, northeast of Tralee, Co. Kerry along the N69. The Kerry County Development Plan, 2022-2028 sets out policies and objectives for the development of the County during the period of the Plan. The Plan seeks to secure the sustainable development and improvement of the economic, environmental, cultural and social assets of Kerry County. The Plan has outlined objectives for biodiversity within the county. These include: -

- Providing protection to all designated sites, national and European, and to maintain or develop linkages between these,
- Providing protection to protected plants and animals in accordance with legal requirements, and
- Retain areas of local biodiversity value, ecological corridors and habitats which contribute to the county ecological network, to protect them from inappropriate development.

A Strategic Environmental Assessment (SEA; Volume 5 Part 1), Natura Impact Report (NIR; Volume 5 Part 2) and Strategic Flood Risk Assessment (Volume 5 Part 3) was prepared for the Kerry County Development Plan, which assessed the CDP and its potential to adversely affect the environment as a whole and the integrity of Natura 2000 sites. The NIR can be read at: -

<https://cdp.kerrycoco.ie/wp-content/uploads/2023/07/Volume-Five-Environmental-Assessments.pdf>

This sets out in full the approach to the Appropriate Assessment, how aspects of the Plan were considered and how the Plan will be implemented and delivered while protecting European sites; thus, ensuring that potential impacts were avoided, reduced or offset. Thus, the finding of the assessments was that the Plan will not adversely affect the general biodiversity and the integrity of Natura 2000 sites due to the incorporation of mitigation measures into the Plan as a result of the assessment processes.

6.4.2. Projects

Projects that have been proposed and/or granted planning permission in the vicinity of the proposed works area project within the last 5 years were reviewed through the Kerry County Council Planning Enquiry System and the National Planning Application Map Viewer (MyPlan.ie).

To the north Application No. 20815 (400m from the Fahavane stream) was for the “Construct an over ground slurry storage tower, including all associated ancillary concrete and site works. All work to be carried out”. Application No. 22882 (240m from the Fahavane stream) was for the “Construct a dwelling house, domestic garage and tertiary treatment system and infiltration/treatment area and all associated site works”. All other applications are older the 5 years.

Regarding potential water quality impacts, these projects will have to comply with the EPA’s *Code of Practice for Wastewater Treatment Systems for Single Houses* (EPA, 2009, 2018) and have conditions attached to their planning permission, such as siting of septic tanks, foul and surface water drainage, and clean surface water run-off drainage facilities. Projects of this scale are not expected to give rise to significant disturbance of hydrological impacts. Therefore, the proposed developments will not result in negative impacts on any of the features of interest for which the Lower River Shannon SAC has been designated.

6.4.3. Conclusion of Cumulative Assessment

In the review of the projects and plans that was undertaken, no works that could potentially result in additional or in-combination impacts was identified. Neither was any potential for different (new) impacts resulting from the combination of the various projects and plans in association with the proposed works at Knockbrack Culvert identified.

7. Conclusions

This NIS has provided an assessment of all potential direct or indirect adverse effects which have the potential to cause likely significant impacts on European sites.

Where the potential for any likely significant effects on any European Site has been identified then, as is apposite when conducting a Stage Two Appropriate Assessment, consideration has been given to the mitigation measures which have been identified and which will be implemented in order to avoid potential water pollution events, in particular. The measures ensure that the proposed repair works will not adversely affect the integrity of any European sites. In conclusion, in circumstances where the mitigation measures identified in this NIS are implemented, there is no reasonable scientific doubt remaining as to the absence of adverse effects on the constitutive characteristics of Lower River Shannon SAC.

Therefore, it can be objectively concluded that the proposed repairs, whether individually or in combination with other plans or projects, will not adversely affect the integrity of any European site.

8. References

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Appendices



Appendix A. Proposed Works Drawings

MUNSTER BRIDGES TERM MAINTENANCE CONTRACT NR.4 KNOCKBRACK CULVERT

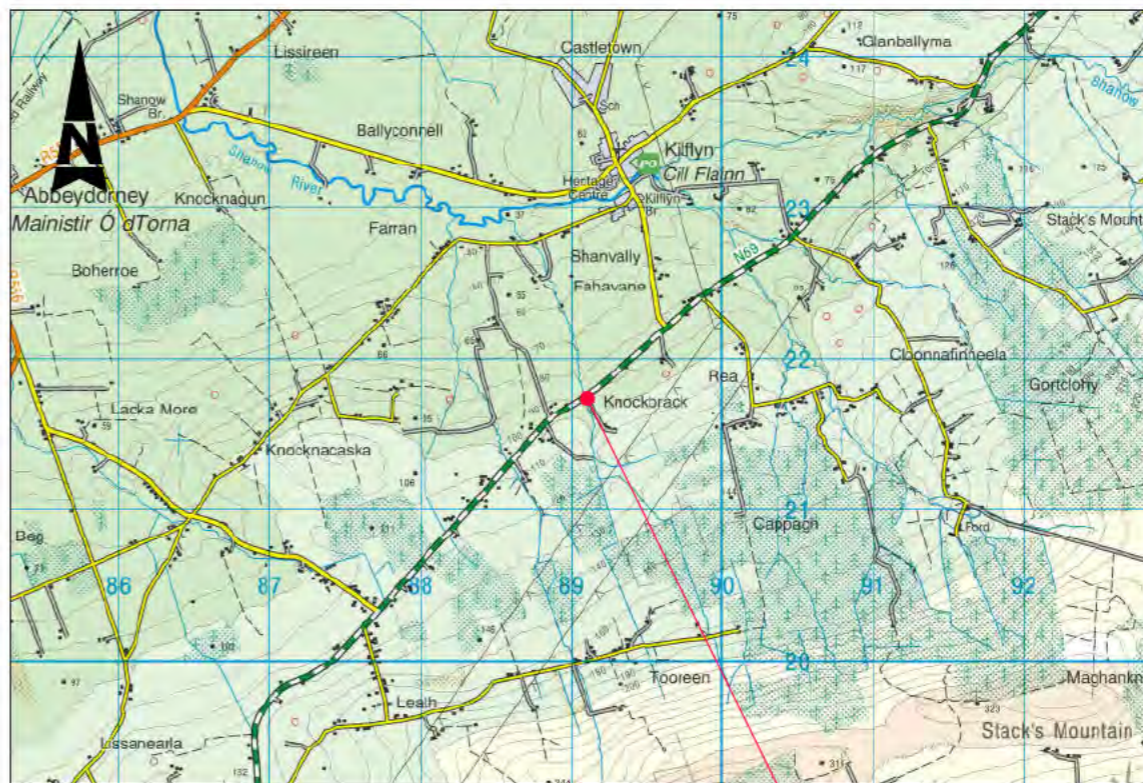
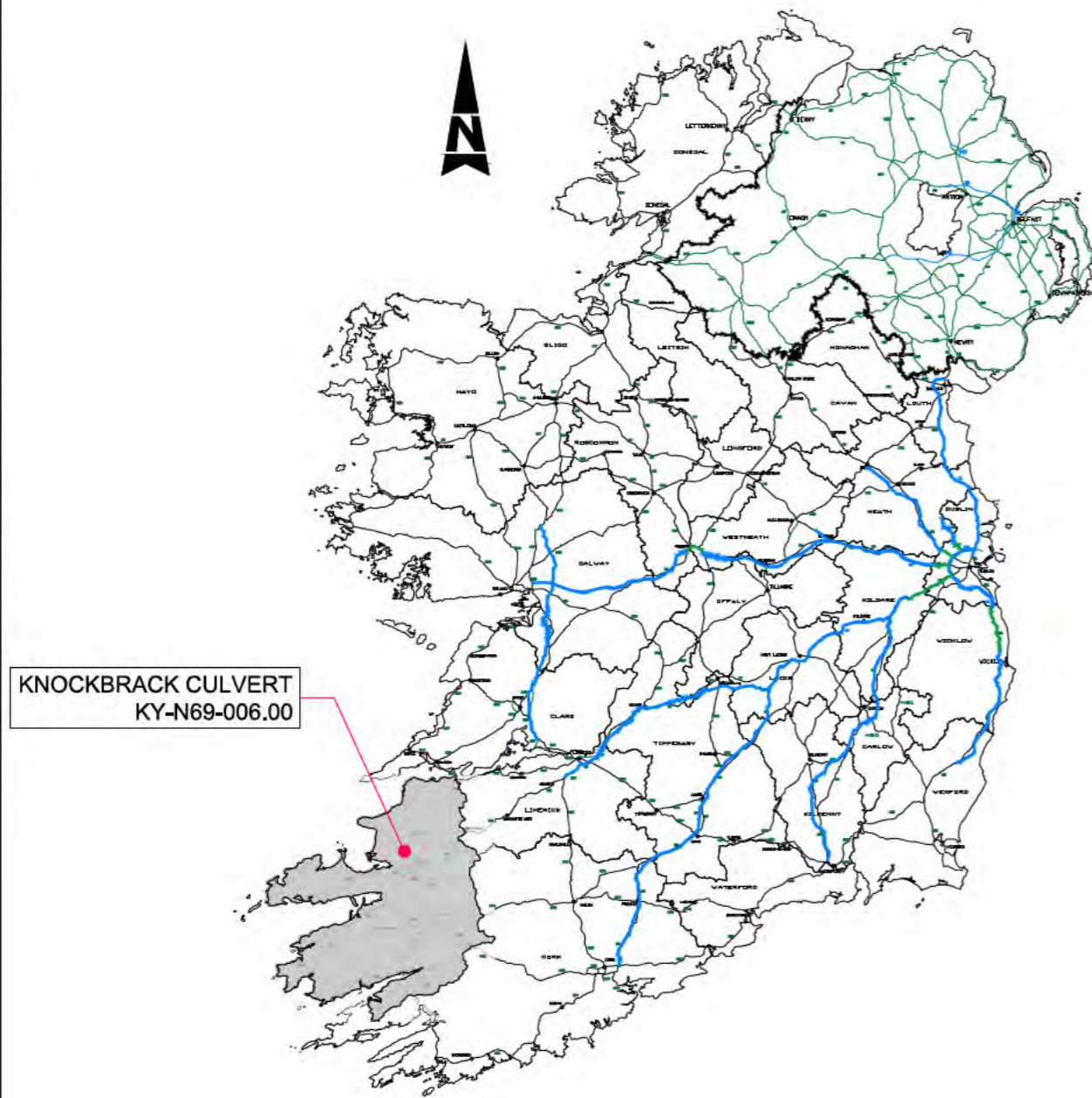
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5219386-ATK-Z1-XX-SK-CE-901011	KNOCKBRACK CULVERT (KY-N69-006,00) SITE LOCATION MAP	-
5219386-ATK-Z1-XX-SK-CE-901012	KNOCKBRACK CULVERT (KY-N69-006,00) EXISTING PHOTOGRAPHS	-
5219386-ATK-Z1-XX-SK-CE-901013	KNOCKBRACK CULVERT (KY-N69-006,00) NON-ROUTINE MAINTENANCE PROPOSED GENERAL ARRANGEMENT	-
5219386-ATK-Z1-XX-SK-CE-901014	KNOCKBRACK CULVERT (KY-N69-006,00) NON-ROUTINE MAINTENANCE PROPOSED PLAN AND SECTION	-
5219386-ATK-Z1-XX-SK-CE-901015	KNOCKBRACK CULVERT (KY-N69-006,00) NON-ROUTINE MAINTENANCE CROSS SECTION AND DETAILS	-

Review Issue

Volume A : Works Requirements
Part 2 : Drawings

December 2023





- GENERAL NOTES**
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
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Client: **TRANSPORT INFRASTRUCTURE IRELAND (TII)**

Project: **MUNSTER BRIDGES TERM MAINTENANCE CONTRACT NR.4**

Purpose: ISSUED FOR REVIEW		Title: KNOCKBRACK CULVERT (KY-N69-006.00) SITE LOCATION MAP	
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	Date 19.12.23	Date 19.12.23	Date 19.12.23
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Date: Jan 15, 2024 - 3:37pm Plotted by: SOCannor



1. EAST APPROACH TO STRUCTURE



2. NORTHERN ELEVATION



3. NORTHERN APRON LOOKING NORTH



4. VOIDS AND CRACKS TO DOWNSTREAM APRON No. 1



5. VOIDS AND CRACKS TO DOWNSTREAM APRON No. 2



6. UPSTREAM APRON FACING SOUTH



7. EXISTING UPSTREAM TRAINING WALL



8. CRACKING TO UPSTREAM APRON



9. CRACKING TO UPSTREAM APRON AND TRAINING WALL

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Purpose ISSUED FOR REVIEW

Title KNOCKBRACK CULVERT (KY-N69-006.00) EXISTING PHOTOGRAPHS

Original Scale	Des/Drawn	Checked	Authorised

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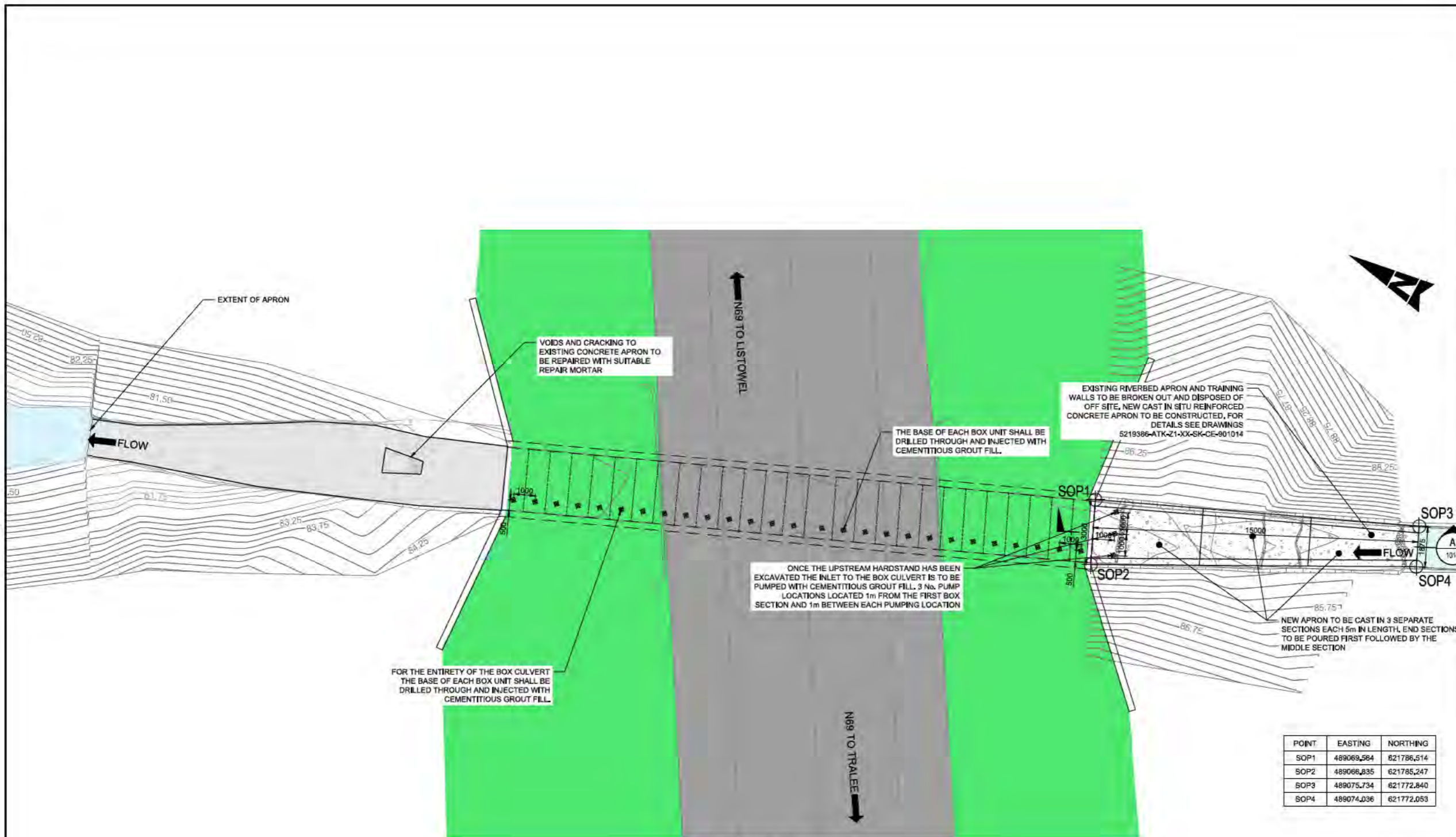
Client TRANSPORT INFRASTRUCTURE IRELAND (TII)

Project MUNSTER BRIDGES TERM MAINTENANCE CONTRACT NR.4

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Plotted by: SOConnor



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SOP3	489075.734	621772.840
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PROPOSED PLAN
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Scale at A3 1:200

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 - ALL ER TO BE TREATED AS FIBRE UNLESS NOTED OTHERWISE.

- GENERAL NOTES**
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 - SCAFFOLDING WITH SUITABLE NON-POROUS PROTECTIVE SHEETING SHALL BE ERCTED OVER THE WATERCOURSE TO PREVENT ANY REMOVED VEGETATION OR LOOSE MORTAR ENTERING WATERCOURSE.

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Client: **TRANSPORT INFRASTRUCTURE IRELAND (TII)**

Project: **MUNSTER BRIDGES TERM MAINTENANCE CONTRACT NR.4**

Purpose: **ISSUED FOR REVIEW**

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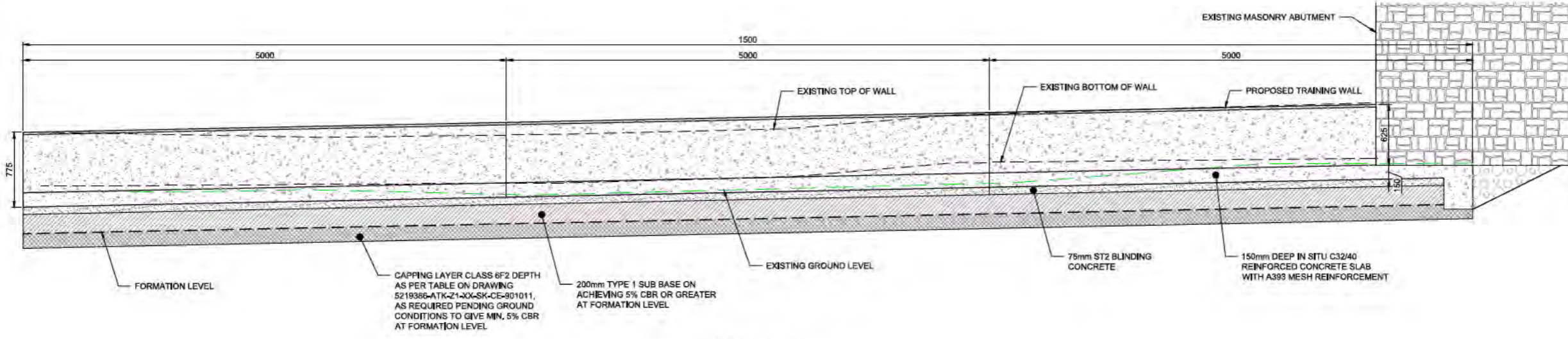
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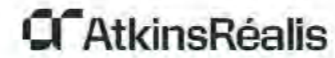
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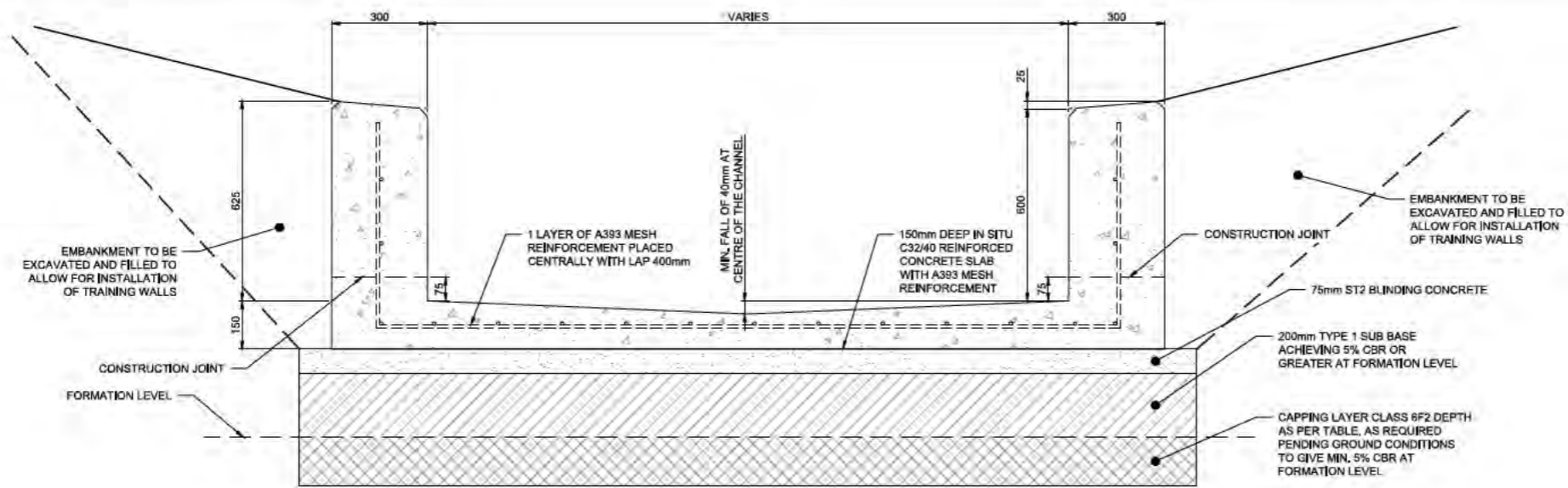
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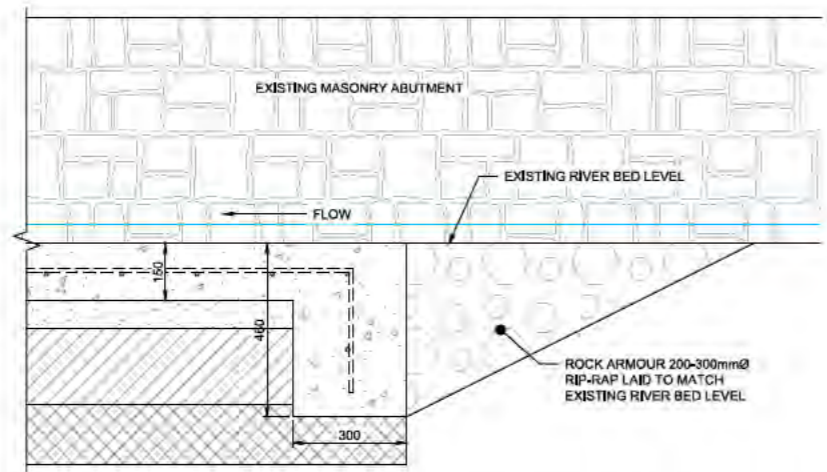
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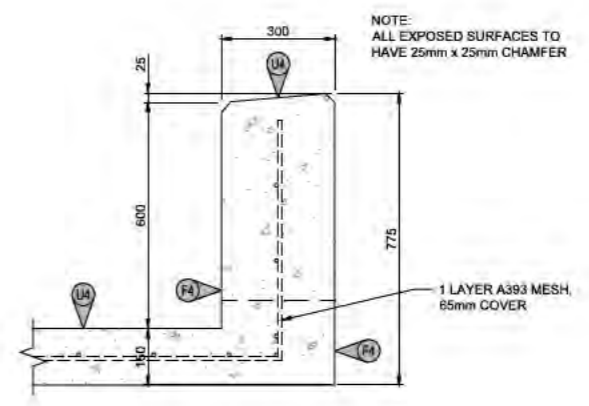


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5		0

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Scale at A3 1:20



UPSTREAM RIVERBED START OF LINING DETAIL
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DETAIL B - PLINTH DETAIL
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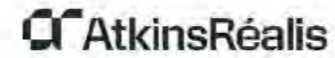
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Purpose		ISSUED FOR REVIEW			
Title		KNOCKBRACK CULVERT (KY-N69-006.00) NON-ROUTINE MAINTENANCE CROSS SECTION AND DETAILS			
Original Scale	1:10	Des/Drawn	Checked	Authorised	
Date	14.12.23	Date	14.12.23	Date	14.12.23
Status	P	Drawing Number	5219386-ATK-Z1-XX-SK-CE-901015	Rev	-

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