Stonyisland Accommodation Bridge Replacement

Killimor Arterial Drainage Scheme

B58, C1/1/1 – 400 Chainage

Screening for Appropriate Assessment & Natura Impact Statement

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Stonyisland Accommodation Bridge Replacement

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1. INTRODUCTION

Delichon Ecology have been commissioned by the Office of Public Works (OPW) to carry out a Screening for Appropriate Assessment (AA) Natura Impact Statement (NIS) for proposed accommodation bridge replacement works at Stonyisland, Portumna, Co. Galway B58, C1/1/1 – 400 Chainage. These works are undertaken as part of the Killimor Arterial Drainage Scheme. The location of the proposed accommodation bridge works are presented in **Figure 1-1**.

This Screening for Appropriate Assessment & Natura Impact Statement (NIS) has been prepared to provide the competent authority, the OPW, with the relevant scientific information to conduct the Appropriate Assessment (AA). This information will allow OPW to determine, in view of best scientific knowledge, if the proposed project, individually or in combination with other plans and projects is likely to have a significant effect on European sites and, where necessary, to ascertain whether or not the proposed project would adversely affect the integrity of a European site(s).

1.1 Project Location & Description

The proposed works includes the refurbishment of an existing accommodation bridge and extension of the bridge on the downstream side using 0.9m diameter precast concrete pipe culverts. Works will also involve installing new wingwalls, 2 new pre-cast concrete parapets and bridge deck. Work will be delivered in accordance with the OPW Standard Design. (Drawing Refs 2480-DR-003-P2 & 2480-DR-006-P1 – See **Appendix A**). Precast concrete pipes will be used to reduce the requirement for in-situ concrete works.

The site is located immediately off the L-87851-0 and accessed via a local field gate entrance.

Works on site will be carried out during standard OPW hours re: 08:00 – 16:30. Channel C1/1/1 Stonyisland, Portumna – B58 @ Chainage 400 has a base width of less than 3m and is therefore classified as a minor channel for arterial drainage purposes. The flow and water levels in the channel will vary depending on recent rainfall patterns and time of year works are being undertaken. It is intended to carry out works in July/August 2023.

Bridge B58 is located on OPW channel C1/1/1 (Chainage 400) in Stonyisland, Portumna, Co. Galway. GPS Coordinates (53.0848, -8.3107) (See **Figure 1.1** below). The works will be completed in accordance with the measures presented in the Environmental Guidance: Drainage Maintenance & Construction[1].

1.2 Proposed Works Methods

1.2.1 Site Preparation

The works area shall be fenced off to provide safety and security, as required. Livestock fencing shall be installed given the location of the works within agricultural land and if there is livestock present. No works shall begin before the site works area is fully fenced off and secure. A small site compound

[1] Brew, T., Gilligan, N., 2019, Environmental Guidance: Drainage Maintenance and Construction. Series of Ecological Assessments on Arterial Drainage Maintenance No 13. Environment Section, Office of Public Works, Trim, Co. Meath, Ireland

containing a steel container and eating facilities will be used to service works. Designated areas within the Site Compound will be established for welfare facilities, materials storage, vehicle parking and plant storage (See Method Statement in **Appendix B** for proposed location).

Works will be carried out in a period of sustained dry weather. The Foreman, Site Supervisor and excavator operators shall walk the site in advance of any works proceeding to assess ground conditions, determine suitability of the area for the placement of machinery, location of any services, such as overhead/underground powerlines or if there is a requirement for the use of bog mats.

The findings of the site walkover survey suggests that there was also no evidence of underground services or overhead power lines observed in the vicinity of the works area. On all occasions, the excavator operator must be satisfied with the ground conditions upon which they intend to work from. When the excavator operator decides to position the excavator adjacent to the drain bank, they must ensure the bank is stable, wide enough and has sufficient bearing capacity to accommodate the machine.

1.2.2 De-watering of Works Area/Excavations

- Given the nature of the channel and associated low or negligible flow conditions, damming and over-pumping will be the method adopted for dewatering the works area to facilitate operations.
- A low level dam will be constructed either side of the bridge structure to facilitate dewatering of the works area. The dam construction will consist of locally sourced clay material, compacted in 225mm layers, lined with polythene to enclose material. The dams will be constructed circa 5m upstream and downstream of the existing bridge structure. A sump will then be formed adjacent to the downstream dam to facilitate pumping. The dam will be constructed to allow a sufficient freeboard above the low water level.
- Once the dams are in-situ, a 4/6 inch pump will be set up adjacent to the bridge. The pump will remove water from the excavation area sump which will be released onto grassland at an appropriate distance from the channel to allow natural filtration to occur through the in-situ grasses/soils. Should volumes of overpumped water exceed the absorption capacity of the receiving lands, overpumped water will be put through a silt sock or silt bag. Work will only be undertaken in suitably low flow conditions. Pump hoses shall be placed at a location that does not pose a tripping hazard to personnel and away from the plant operations.

1.2.3 Removal of old structure & preparation of foundation

Once dewatering structures are in-situ, the existing pipe will remain and the old concrete stub parapets and defective downstream wingwall will be removed via the excavator. Material will be removed from the area and stockpiled temporarily. This material will be reused as pipe backfill during the extension of the downstream culvert.

The channel bed for the pipe extension, will be excavated to an appropriate level to allow formation of an adequate base for the new culvert pipes to sit. The invert level of the new pipe will match that of the existing pipe culvert and excavation depth will allow for a suitable foundation to be formed.

As ground conditions are relatively poor, imported clean broken stone (3") and granular material (Cl.804) will be placed and compacted along with lean-mix concrete to create the formation level. All aggregates imported to site will be certified and supplied by approved quarries. The formation level should be level and checked using a rotating laser level. As per design drawing 2480-DR-003-P2 concrete bedding shall be 225mm below pipe invert. Concrete will be formed against the exiting bank.

The foundation for the end-wall and wing-walls will be formed against the bank and timber edge shutters will be required at either end. Foundation shall be a minimum of 200mm in depth.

2 layers of A393 mesh reinforcement will be used in the foundation throughout. 40mm cover shall be maintained between the reinforcement and the external finish of the concrete.

1.2.4 Installing and forming new pipe culvert

- 2 number 0.900m Diameter/1M Length Concrete pipes shall be lifted into place, using a Truck Mounted Hiab.
- Once the pipes are in position and secured, the pipes will be haunched with concrete to a depth of 150mm on all sides.

1.2.5 Formation of Wing Walls

- The end walls shall be formed around the downstream pipes as per the design drawing.
- Peri Formwork will be used to form the end walls and wing-walls. The end-walls shall be formed to reach upwards and create a foundation for the parapet walls. The depth of wing wall base shall be 300mm as detailed in 2480-DR-003-P2.
- Erect formwork for wing-walls (as per manufacturer/supplier instructions). Wing-walls are to be constructed as per OPW standard design drawings. Ready-mix concrete (as per specification outlined on design drawings) shall be placed in the wing-walls and vibrated using a poker vibrator. Formwork can be removed following adequate curing of the concrete (as per Engineer/Foreman instruction).
- Place granular material (3" broken stone & Cl.804) and as dug material, above the lean-mix concrete and around the pipe to the finished level of the bridge crossing.

1.2.6 Formation of Parapet Walls

- Once the pipes are in position and wing walls formed, works in installing the pre-cast concrete parapets will commence.
- 4 number Pre-cast concrete parapets shall be lifted into place and fixed to the outer face of the wing walls, using the Truck Mounted Hiab. Once in position edge shutters are fixed to the outer end of both parapet walls.
- 2 layers of A393 mesh are then placed and fixed between both parapet walls.
- Ready-mix concrete (as per specification outlined on design drawings) shall be placed in the wing-walls and vibrated using a poker vibrator. A brush finish to be applied unless otherwise stated.
- Formwork can be removed following adequate curing of the concrete (as per Engineer/Foreman instruction

1.2.7 Completion of Works

- Following the completion of the construction works, the surrounding area shall be reinstated to a condition similar to, or better than the pre-works situation.
- Boundaries shall be re-established to the landowner's satisfaction.
- A photographic survey of the completed works shall be carried out by the Site Foreman.
- Records of any utility diversions and their locations shall be maintained and filed appropriately.
- A final inspection of the completed works shall be carried out by the Site Foreman and OPW Engineer to ensure satisfaction with the quality of the works and allow sign-off on OPW Project Risk Assessment / Safety Plan.

1.3 Legislative Context for Appropriate Assessment

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, better known as "The Habitats Directive", provides legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000.

Natura 2000 sites are defined under the Habitats Directive (Article 3) as a coherent European ecological network of special areas of conservation, composed of sites hosting the natural habitat types listed in Annex I and habitats of the species listed in Annex II, shall enable the natural habitat types and the species' habitats concerned to be maintained or, where appropriate, restored at a favourable conservation status in their natural range. In Ireland, these sites are designated as European Sites and include Special Protection Areas (SPAs), established under the EU Birds Directive (79/409/EEC, as codified by 2009/147/EC) for birds and Special Areas of Conservation (SACs), established under the Habitats Directive 92/43/EEC for habitats and species.

The Habitats Directive has been transposed into Irish law by Part XAB of the Planning and Development Act, 2000 - 2015 and the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477/2011) as amended.

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to adversely affect the integrity of European Sites (Annex 1.1).

Article 6(3) establishes the requirement for Appropriate Assessment (AA):

Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In 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(3) of the Habitats Directive, transposed into Irish Law relevant to this project includes Part XAB of the Planning and Development Act, 2000-2019 and the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended).

Natura 2000 sites in Ireland (herein referred to as European sites) that form part of the Natura 2000 network of protected sites include Special Areas of Conservation (SACs) designated due to their significant ecological importance for species and habitats protected under Annexes I and II respectively of the Habitats Directive, and Special Protected Areas (SPAs), designated for the protection of populations and habitats of bird species protected under the EU Birds Directive (Council Directive 2009/409/EEC). Features for which SACs and SPAs are designated are termed Qualifying Interests and Special Conservation Interests respectively. Collectively, Qualifying Interests and Special Conservation Interests are herein referred to as Qualifying Features.

As the proposed project is not directly connected with or necessary to the management of any European Site, DAFM as the competent authority, is obliged to assess, in view of best scientific knowledge, if the proposed development, individually or in combination with other plans or projects, is likely to have a significant effect on European Sites.

The staged assessment process undertaken to meet Article 6(3) obligations is described in **Section 2** below.

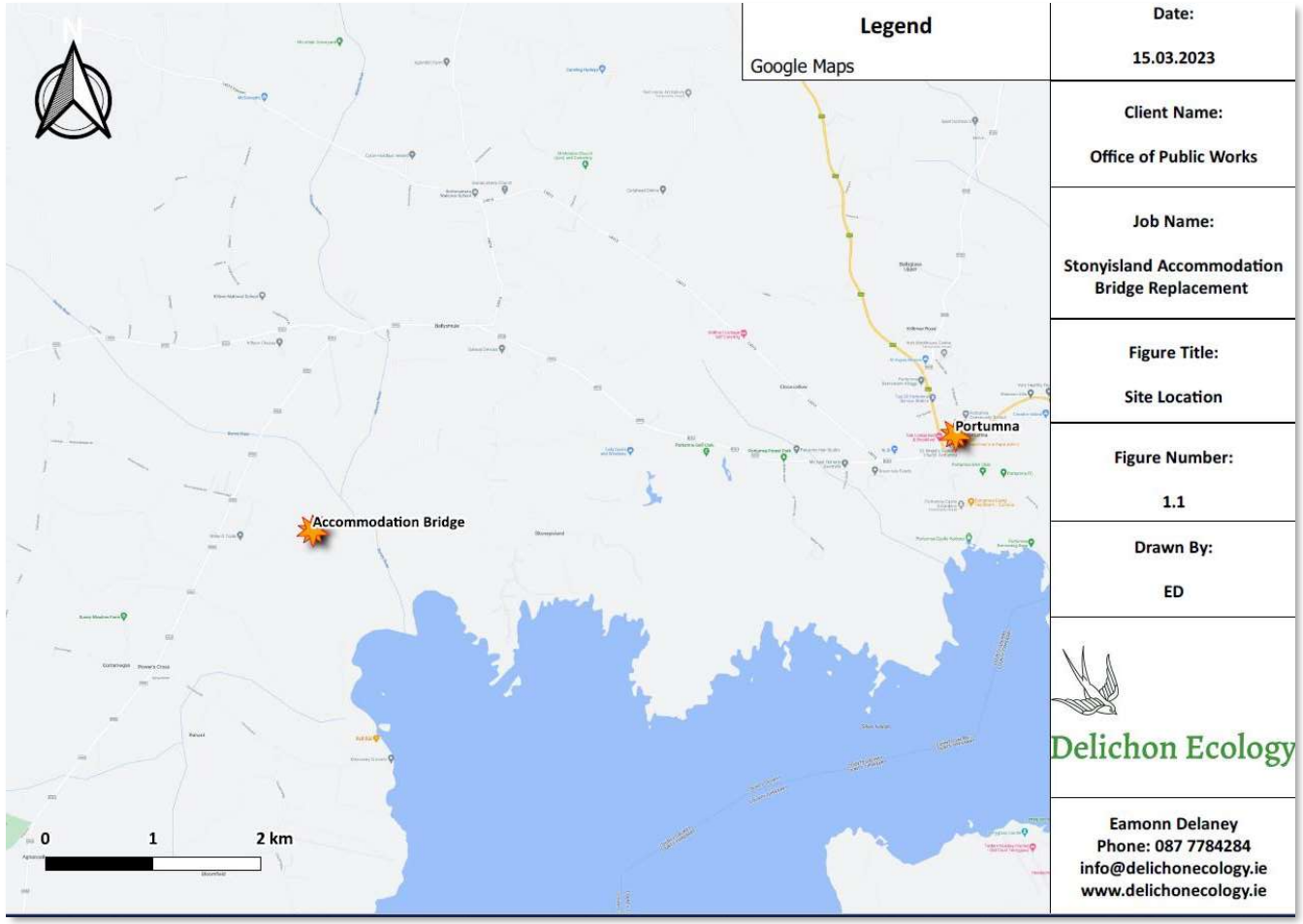


Figure 1-1: Location of Proposed Accommodation Bridge Replacement Works

2 METHODOLOGY

The Department of the Environment, Heritage and Local Government guidelines (DEHLG, 2009, rev. 2010) outlines the European Commission's methodological guidance (EC, 2002) promoting a four-stage process to complete the AA, and outlines the issues and tests at each stage. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required.

The four stages are summarised diagrammatically in **Figure 2-1**. Stages 1-2 deal with the main requirements for assessment under Article 6(3). Stage 3 may be part of the Article 6(3) Assessment or may be a necessary precursor to Stage 4. Stage 4 is the main derogation step of Article 6(4).

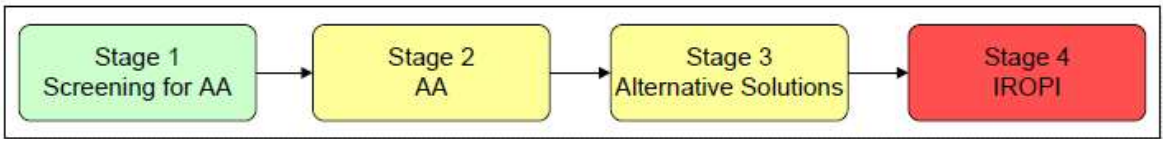


Figure 2-1: Four Stages of Appropriate Assessment

2.1.1 Stage 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):

Whether a plan or project is directly connected to or necessary for the management of the site, and

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, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 (AA). Screening should be undertaken without the inclusion of mitigation, unless potential impacts clearly can be avoided through the modification or redesign of the plan or project, in which case the screening process is repeated on the altered plan. The greatest level of evidence and justification will be needed in circumstances when the process ends at screening stage on grounds of no impact.

2.1.2 Stage 2 – Appropriate Assessment (Natura Impact Statement)

The aim of Stage 2 of the AA process is to identify any adverse impacts that the plan or project might have on the integrity of relevant European sites. As part of the assessment, a key consideration is 'in combination' effects with other plans or projects. Where adverse impacts are identified, mitigation measures can be proposed that would avoid, reduce or remedy any such negative impacts and the plan or project should then be amended accordingly, thereby avoiding the need to progress to Step 3.

This stage 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 mitigation measures necessary to avoid, reduce or offset negative effects. The proponent of the plan or project will be required to submit a Natura Impact Statement, i.e. the report of a targeted professional scientific examination of the plan or project and the relevant European sites, to identify and characterise any possible implications for the site in view of the site's conservation objectives, taking account of in-

combination effects. This should provide information to enable the public authority to carry out the AA.

The information required in a Natura Impact Statement, is outlined in Regulation 42(5) (a) of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011) as amended, as follows:

A Natura Impact Statement shall, in addition to addressing the issues referred to in the interpretation contained in Regulation 2(1), include such information or data as the public authority considers necessary, and specifies in a notice given under paragraph (3), to enable it to ascertain if the plan or project will affect the integrity of the site.

Where appropriate, a Natura Impact Statement shall include, in addition—

i. the alternative solutions that have been considered and the reasons why they have not been adopted,

ii. the imperative reasons of overriding public interest that are being relied upon to indicate that the plan or project should proceed notwithstanding that it may adversely affect the integrity of a European site,

iii. the compensatory measures that are being proposed.

If the assessment is negative, i.e. adverse effects on the integrity of a site cannot be excluded, then the process must proceed to Stage 3, or the plan or project should be abandoned. The competent authority must make a determination to that effect before proceeding to the next stage.

2.1.3 Guidance

This Screening for AA and NIS report has been prepared with regard to the relevant provisions of the EU Council Directive 92/43/EEC and Ireland's EU (Birds and Natural Habitats) Regulations 2011 (as amended).

The methodology followed for this assessment has had regard to the following guidance and legislation:

- DoEHLG (2009, rev. 2010) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government;
- DoEHLG Circular NPWS 1/10 & PSSP 2/10 Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities;
- European Commission (EC) (2018), Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats Directive' 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission;
- EC (2002) Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission;

- EC (2021) Assessment of Plans and Projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC;
- EC (2007a) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission. European Commission;
- EC, (2007b), Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC. European Commission;
- EC (2013) Interpretation Manual of European Union Habitats. Version EUR 28. European Commission;
- Inland Fisheries Ireland (2021a). Guidance Notes for AA Screenings in the Vicinity of Watercourses;
- Inland Fisheries Ireland (2021b). Guidance Notes for Natura Impact Statements (NIS) in the Vicinity of Watercourses;
- Chartered Institute of Ecology and Environmental Management (CIEEM) Version 1.1 (September 2019), Guidelines for Ecological Impact Assessment in the UK and Ireland;
- NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report;
- NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments. Unpublished NPWS report;
- Office of the Planning Regulator (OPR) (2021) Practice Note PN01 - Appropriate Assessment Screening for Development Management.
- Brew, T., Gilligan, N. (2019) Environmental Guidance: Drainage Maintenance and Construction. Series of Ecological Assessments on Arterial Drainage Maintenance No 13. Environment Section. Office of Public Works, Trim, Co. Meath, Ireland;
- Office of Public Works (OPW) (2011) The Office of Public Works Arterial Drainage Maintenance Service Environmental Management Protocols & Standard Operating Procedures;
- The European Communities (Birds and Natural Habitats) Regulations 2011 as amended;
- The Planning and Development Act 2000-2022;
- The Planning and Development Regulations 2001-2022; and
- Recent Irish and European case law on the Habitats Directive.

2.1.4 Information Consulted for this Report

This assessment has been informed by the following sources of data:

- Information on the location, nature and design of the proposed project as provided by the client;
- Department of Housing, Planning, Community and Local Government (DHPCLG) online land-use mapping (www.myplan.ie/en/index.html);
- Office of Public Works (OPW) National Flood Hazard Mapping website (www.floodmaps.ie);
- Review of the National Biodiversity Data Centre (NBDC) webmapper https://maps.biodiversityireland.ie/Map

- Geological Survey of Ireland - National Draft Bedrock Aquifer map;
- Geological Survey of Ireland - Groundwater Database (www.gsi.ie);
- Environmental Protection Agency (EPA) geoportal mapping tool (https://gis.epa.ie/EPAMaps/);
- National Parks and Wildlife Service protected site and species information and data (https://www.npws.ie/protected-sites);
- Spatial data in respect of Article 17 reporting, available online at https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17.
- Spatial data in respect of Article 12 reporting, available online at https://www.npws.ie/maps-and-data/habitat-and-species-data/article-12-data.
- National Biodiversity Data Centre (www.biodiversityireland.ie); and
- Ordnance Survey of Ireland mapping and aerial photography (www.osi.ie).

3 STAGE 1 – SCREENING FOR APPROPRIATE ASSESSMENT

This section provides the information required for the competent authority (OPW) to undertake a Screening for AA and determine in view of best scientific knowledge, whether the proposed works, individually or in combination with other plans and projects, is likely to have a significant effect on the European site. Specifically, it aims to:

Provide information on, and assess the potential for the proposed works to significantly impact on European sites; and

Determine whether the activities proposed, alone or in combination with other projects, are likely to have significant effects on European sites in view of their Conservation Objectives.

This screening assessment provides information to address the following elements:

1. Description of the plan or project, and local site or plan area characteristics. The description covers the full scope of the proposed plan or project (i.e. deconstruction phase and operational phase).

2. Description of the receiving environment setting of the proposed plan or project and its surrounds.

3. Identification of relevant European sites within the projects the potential zone of influence. A preliminary assessment to determine connectivity between the proposed works and receptors (i.e. European sites and/ or features for which the sites are designated). Where connectivity exists, the receptors in question are brought forward in the screening assessment process.

4. For receptors that exhibit potential connectivity to the proposed work a screening assessment is undertaken to establish whether the plan or project is likely to have a direct, indirect or cumulative effect on receptors based on a consideration of likely impacts (i.e. an assessment of significance of effect).

5. Screening statement with conclusions on whether or not an AA is necessary for the relevant Qualifying Feature of Interest.

3.1 European Sites within the Project Zone of Influence

This stage of the screening for AA process describes European Sites within the Zone of Influence (ZoI) of the proposed project.

Section 3.2.3 of the Guidance for Planning Authorities (DoEHLG, 2010) states that the approach to Appropriate Assessment screening can be different for different plans and projects depending on the scale of the plan, project or programme and the likely associated effects. The overriding criteria determining whether a European Site will be impacted and potentially consequently effected by a proposal is the distance between proposal and a European Site and whether there are pathways for effect linking the proposal to European Sites.

Both UK (Scott Wilson *et al*., 2006) and Irish guidance (DoEHLG, 2010) outline that a distance of 15km may suffice as a likely Zone of Impact (ZoI) in the case of plans on European Sites and may be sufficient

to cover the geographic extent over which significant ecological effects are likely to occur. However for certain projects, the DoEHLG (2010) guidance recognises that the likely ZoI could be '*much less than 15km, and in some cases less that 100m, but this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects'*.

Recent guidance from Office of the Planning Regulator (2021) indicates that the zone of influence for a proposal is the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a European Site. This guidance indicates that the zone of influence should be established on a case-by-case basis using the Source-Pathway-Receptor framework. Using the Source » Pathway » Receptor approach and having regard for the location, the nature of the works, and the small size and scale of the works, it is considered for the purpose of this assessment that the likely ZoI on European Sites is the zone immediately around the proposed bridge accommodation works and ancillary works, in addition to any sites with a hydrological connection downstream of the works and/or with an ecological connection, where distance would be dependent on the qualifying interests of the site. To that end the following sites are located within the Source» Pathway » Receptor zone of influence of the proposed works

- Barroughter Bog SAC (000231);
- Lough Derg (Shannon) SPA (004058);
- Lough Derg, North-east shore SAC (002241);
- Lower River Shannon SAC (002165); and
- River Shannon and River Fergus Estuaries SPA (004077).

Furthermore, there are thirteen European sites located within 15km of the proposed accommodation bridge works (See **Figure 3.1**), these are as follows:

- Barroughter Bog SAC (000231);
- Rosturra Wood SAC (001313);
- Pollnaknockaun Wood Nature Reserve SAC (000319);
- Lough Derg (Shannon) SPA (004058);
- Lough Derg, North-east shore SAC (002241);
- Slieve Aughty Mountains SPA (004168);
- Loughatorick Bog SAC (000308);
- Derrycrag Nature Reserve SAC (000261);
- Cloonmoylan Bog SAC (000248);
- River Shannon Callows SAC (000216);
- Middle Shannon Callows SPA (004096);
- Kilcarren-Firville Bog SAC (000647); and
- Ardgraigue Bog SAC (002356).

The assessment of connectivity between the European Sites and the proposed works follows the potential source-pathway-receptor model, which identifies the source of likely significant impacts, if any, the pathway (land, air, hydrological, hydrogeological pathways, etc) along which those impacts may be transferred from the source to the receiving environmental receptors (i.e. European Sites and/ or features for which the sites are designated).

Where it is evident that there is no connectivity between the proposed work and receptors (i.e. European Sites and/ or features for which the sites are designated), the receptors are excluded from the AA process. Similarly, where connectivity exists between the proposed work and receptors but is deemed not to result in likely significant effects to the receptor, the receptor can be screened out (i.e. likely significant effects to receptors excluded; receptor not considered further in AA process).

In contrast to the above, where it is not possible to exclude likely significant effects on the basis of best scientific knowledge, a more detailed scientific assessment of the proposed works is required which focuses on the European Sites likely to be affected and the relevant designated feature in question.

The integrity of a European Site (referred to in Article 6.3 of the EU Habitats Directive) is determined based on the Conservation Status of the features (habitats and/ or species) for which SACs and SPAs are designated. The Qualifying Interests (QI) and Special Conservation Interests (SCIs) for protected sites have been obtained through a review of the Conservation Objectives documents available from the NPWS website www.npws.ie.

Figure 3-1 and **Figure 3-2** shows the European sites within the Zone of Influence of the proposed accommodation bridge works. **Table 3-1** itemises the features of qualifying interest and details on the distance and connectivity of European Sites within the zone of influence of the proposed works.

Table 3-1: European Sites within the zone of influence and 15km of the proposed accommodation bridge works

Site Code	Site Name	Features of Qualifying Interest (SAC) / Special Conservation Interest (SPA)	Distance from Study Area	Connectivity
000231	Barroughter Bog SAC	7110 Active raised bogs 7120 Degraded raised bogs still capable of natural regeneration 7150 Depressions on peat substrates of the Rhynchosporion	The proposed accommodation bridge replacement works are located within the footprint of this SAC	Potential direct and indirect connectivity between the proposed works and this European Site
001313	Rosturra Wood SAC	91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	2.8km south-west	There is no potential for connectivity (via surfacewater, groundwater or other environmental vectors) between the proposed bridge replacement works and this European Site.
000319	Pollnaknockaun Wood Nature Reserve SAC	91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	4.5km south-west	There is no potential for connectivity (via surfacewater, groundwater or other environmental vectors) between the proposed bridge replacement works and this European Site.
004058	Lough Derg (Shannon) SPA	A017 Cormorant *Phalacrocorax carbo* A061 Tufted Duck *Aythya fuligula* A067 Goldeneye *Bucephala clangula* A193 Common Tern *Sterna hirundo*	1.5km downstream and 900m south-east	Potential for indirect connectivity through the drainage channel underlying the bridge and the downstream connected areas of the Kilcrow_070 watercourse (IE_SH_25K010700).

Site Code	Site Name	Features of Qualifying Interest (SAC) / Special Conservation Interest (SPA)	Distance from Study Area	Connectivity
002241	Lough Derg, North-east shore SAC	5130 *Juniper communis* formations on heaths or calcareous grasslands 7210 Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae 7230 Alkaline fens 8240 Limestone pavements 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) 91J0 *Taxus baccata* woods of the British Isles*	1.5km downstream and 900m south-east	Potential for indirect connectivity via the Kilcrow_070 stream. However the potential for impact and consequent effects to this European Site are not likely due to the nature of the works and the tenuous connectivity between the proposed works footprint and this European Site. This European Site does not support mobile QI species, therefore the risk of ex-situ disturbance effects will not occur. Indirect impacts and secondary effects to the habitats of Qualifying Interest will not occur as the proposed works will not require instream excavation works, movement of soils, works with cement or other deleterious compounds.
004168	Slieve Aughty Mountains SPA	A082 Hen Harrier *Circus cyaneus* A098 Merlin *Falco columbarius*	2.2km west / south-west	There is no potential for connectivity (via surfacewater, groundwater or other environmental vectors) between the proposed accommodation

Site Code	Site Name	Features of Qualifying Interest (SAC) / Special Conservation Interest (SPA)	Distance from Study Area	Connectivity
				bridge works and this European Site.
000308	Loughatorick Bog SAC	7130 Blanket bogs (* if active bog)	12.6km south-west	There is no potential for connectivity (via surfacewater, groundwater or other environmental vectors) between the proposed accommodation bridge works and this European Site.
000261	Derrycrag Wood Nature Reserve SAC	91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	5.9km south-west	There is no potential for connectivity (via surfacewater, groundwater or other environmental vectors) between the proposed accommodation bridge works and this European Site.
000248	Cloonmoylan Bog SAC	7110 Active raised bogs* 7120 Degraded raised bogs still capable of natural regeneration 7150 Depressions on peat substrates of the Rhynchosporion 91D0 Bog woodland*	2.2km south-west	There is no potential for connectivity (via surfacewater, groundwater or other environmental vectors) between the proposed accommodation bridge works and this European Site.
000216	River Shannon Callows SAC	1355 Otter *lutra lutra* 6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	6.6km east	There is no potential for connectivity (via surfacewater, groundwater or other environmental vectors) between

Site Code	Site Name	Features of Qualifying Interest (SAC) / Special Conservation Interest (SPA)	Distance from Study Area	Connectivity
		6510 Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) 7230 Alkaline fens 8240 Limestone pavements* 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)*		the proposed accommodation bridge works and this European Site.
004096	Middle Shannon Callows SPA	A038 Whooper Swan *Cygnus cygnus* A050 Wigeon *Anas penelope* A122 Corncrake *Crex crex* A140 Golden Plover *Pluvialis apricaria* A142 Lapwing *Vanellus vanellus* A156 Black-tailed Godwit *Limosa limosa* A179 Black-headed Gull *Chroicocephalus ridibundus* A999 Wetlands	6.6km east	There is no potential for connectivity (via surfacewater, groundwater or other environmental vectors) between the proposed accommodation bridge works and this European Site.
000647	Kilcarren-Firville Bog SAC	7110 Active raised bogs 7120 Degraded raised bogs still capable of natural regeneration 7150 Depressions on peat substrates of the Rhynchosporion	12.7km east	There is no potential for connectivity (via surfacewater, groundwater or other environmental vectors) between the proposed accommodation bridge works and this European Site.
002356	Ardgraigue Bog SAC	7110 Active raised bogs 7120 Degraded raised bogs still capable of natural regeneration 7150 Depressions on peat substrates of the Rhynchosporion	10.1km north / north-east	There is no potential for connectivity (via surfacewater, groundwater or other environmental vectors) between the proposed accommodation

Site Code	Site Name	Features of Qualifying Interest (SAC) / Special Conservation Interest (SPA)	Distance from Study Area	Connectivity
				bridge works and this European Site.
002165	Lower River Shannon SAC	1029 Freshwater Pearl Mussel *Margaritifera margaritifera* 1095 Sea Lamprey *Petromyzon marinus* 1096 Brook Lamprey *Lampetra planeri* 1099 River Lamprey *Lampetra fluviatilis* 1106 Atlantic Salmon *Salmo salar* (only in fresh water) 1110 Sandbanks which are slightly covered by sea water all the time 1130 Estuaries 1140 Mudflats and sandflats not covered by seawater at low tide 1150 *Coastal lagoons 1160 Large shallow inlets and bays 1170 Reefs 1220 Perennial vegetation of stony banks 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 1310 *Salicornia* and other annuals colonizing mud and sand 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) 1349 Bottlenose Dolphin *Tursiops truncatus* 1355 Otter *Lutra lutra* 1410 Mediterranean salt meadows (Juncetalia maritimi)	40.9km downstream and 32km south	Potential for remote and extremely tenuous connectivity via the drainage channel under the bridge structure, the Kilcrow_070 watercourse and the open waters of Lough Derg.

Site Code	Site Name	Features of Qualifying Interest (SAC) / Special Conservation Interest (SPA)	Distance from Study Area	Connectivity
		3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation 6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) 91E0 *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)		
004077	River Shannon and River Fergus Estuaries SPA	A017 Cormorant *Phalacrocorax carbo* breeding + wintering A038 Whooper Swan *Cygnus cygnus* wintering A046 Light-bellied Brent Goose *Branta bernicla hrota* wintering A048 Shelduck *Tadorna tadorna* wintering A050 Wigeon *Anas penelope* wintering A052 Teal *Anas crecca* wintering A054 Pintail *Anas acuta* wintering A056 Shoveler *Anas clypeata* wintering A062 Scaup *Aythya marila* wintering A137 Ringed Plover *Charadrius hiaticula* wintering A140 Golden Plover *Pluvialis apricaria* wintering A141 Grey Plover *Pluvialis squatarola* wintering A142 Lapwing *Vanellus vanellus* wintering A143 Knot *Calidris canutus* wintering A149 Dunlin *Calidris alpina* wintering A156 Black-tailed Godwit *Limosa limosa* wintering A157 Bar-tailed Godwit *Limosa lapponica* wintering	70km downstream	Potential for remote and extremely tenuous connectivity via the drainage channel under the bridge structure, the Kilcrow_070 watercourse, the open waters of Lough Derg and the main channel of the River Shannon.

Site Code	Site Name	Features of Qualifying Interest (SAC) / Special Conservation Interest (SPA)	Distance from Study Area	Connectivity
		A160 Curlew *Numenius arquata* wintering A162 Redshank *Tringa totanus* wintering A164 Greenshank *Tringa nebularia* wintering A179 Black-headed Gull *Chroicocephalus ridibundus* wintering A999 Wetlands		

The proposed accommodation bridge replacement works are located within Barroughter Bog SAC. As a result these is the potential for direct and indirect connectivity. The proposed works also supports potential indirect, connectivity with two downstream European Sites (Lough Derg SPA and Lough Derg, North-East shore SAC. Given the overlap and potential indirect interconnectivity with these European Sites, potential impacts and consequent effects are considered further in the below text.

Finally, the proposed accommodation bridge works support remote and extremely tenuous connectivity with European Sites within the lower sections of the River Shannon catchment; the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA). Given the nature and scale of the proposed works, the attenuation capacity of the watercourses and waterbodies and the remote and extremely tenuous connectivity between the proposed works and these European Sites, potential for impacts and consequent likely significant effects are not possible.

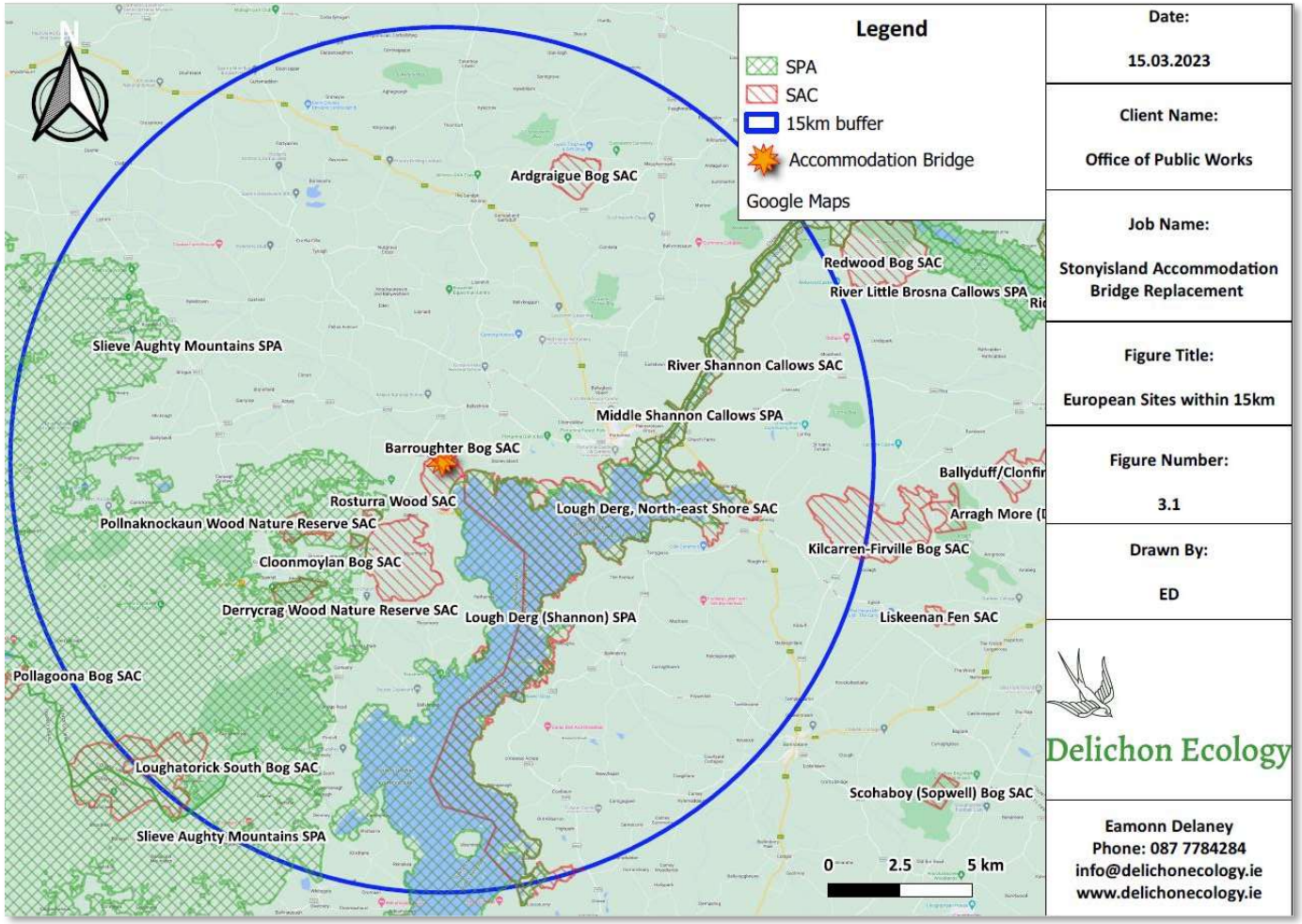


Figure 3-1: European Sites within the zone of influence and 15km of the proposed works

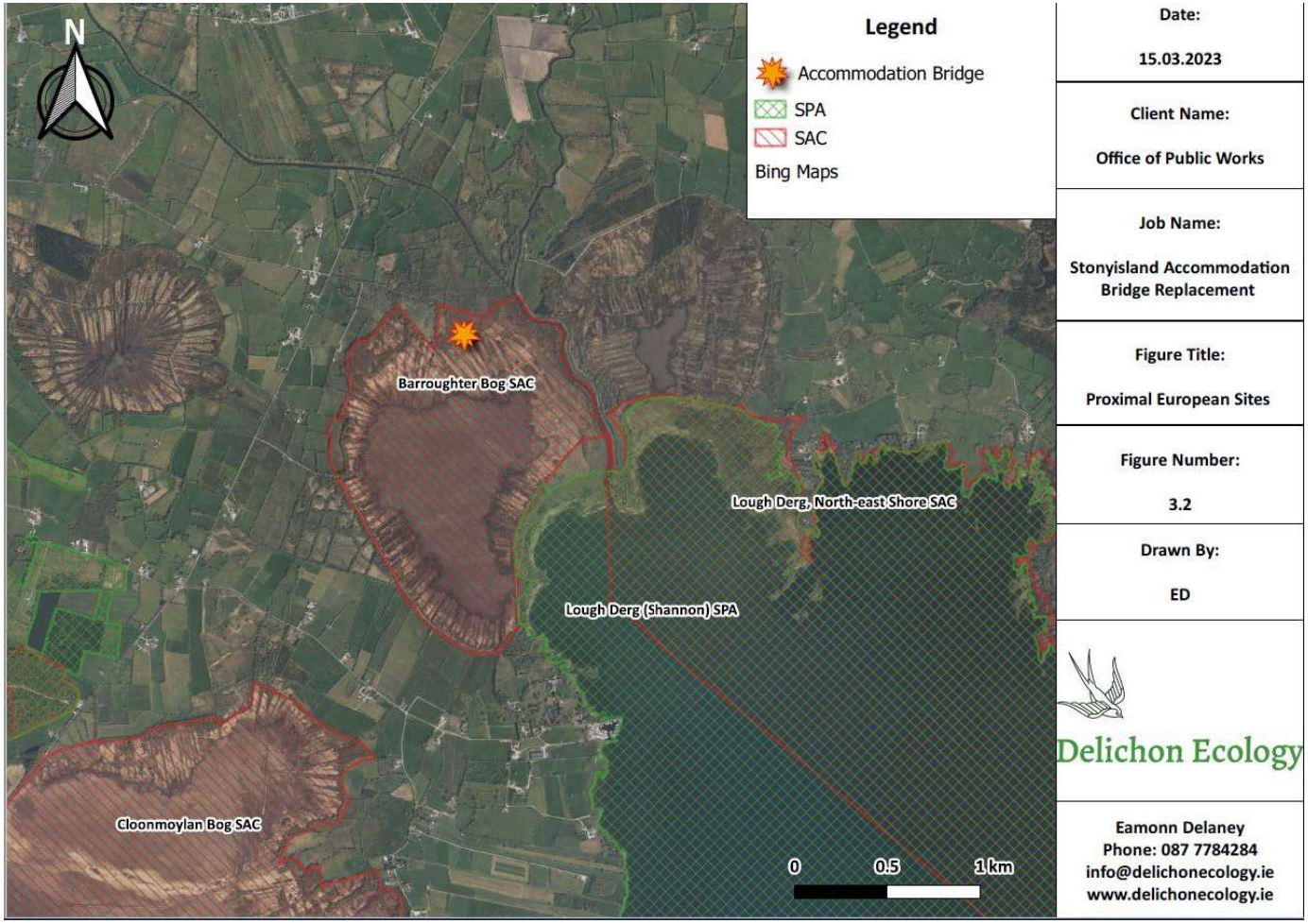


Figure 3-2: Proximal and downstream hydrologically connected European Sites

3.1.1 European Site Descriptions

Site descriptions for European Sites within the project ZoI are presented below.

3.1.1.1 Barroughter Bog SAC (Site Code: 000231)

Barroughter Bog is a relatively small raised bog, situated on the shores of Lough Derg in Co. Galway, a few kilometres east of Woodford, and bounded in the north by the Cappagh River. The bog has a good dome, which is slightly hollowed towards the eastern side. The north-eastern corner (cut off by an old drain and track) and a narrow area in the south-east are fairly dry due to drainage and burning. Barroughter Bog is a raised bog of considerable conservation value. Given its relatively small size, the area of outstanding quaking habitat is remarkably large. Its proximity to the shores of Lough Derg, with its succession from open water through extensive reed beds and marginal scrub, to raised bog, adds to its importance. It is also the only raised bog on the shores of Lough Derg (NPWS, 2013)[2].

3.1.1.2 Lough Derg SPA (Site Code: 004058)

Lough Derg lies within counties Tipperary, Galway and Clare and is the largest of the River Shannon Lakes, being some 40 km long. Its maximum breadth across the Scarriff Bay -Youghal Bay transect is 13 km but for most of its length it is less than 5 km wide. The lake is relatively shallow at the northern end being mostly 6 m in depth but in the middle region it has an axial trench and descends to over 25 m in places. The narrow southern end of the lake has the greatest average depth, with a maximum of 34 m. The greater part of the lake lies on Carboniferous limestone but the narrow southern section is underlain by Silurian strata. Most of the lower part of the lake is enclosed by hills on both sides, the Slieve Aughty Mountains to the west and the Arra Mountains to the east. The northern end is bordered by relatively flat, agricultural country. The lake shows the high hardness levels and alkaline pH to be expected from its mainly limestone catchment basin, and it has most recently been classified as a mesotrophic system. The lake has many small islands, especially on its western and northern sides. The shoreline is often fringed with swamp vegetation (NPWS, 2014a)[3].

3.1.1.3 Lough Derg, North-East Shore SAC (002241)

Lough Derg, the lowest order lake on the River Shannon, is one of the largest bodies of freshwater in Ireland. This SAC, however, only includes the northern shore of the lake from the mouth of the Cappagh River in the north-west to just below Black Lough at the north-eastern shore. The greater part of this site lies on Carboniferous limestone, although there is Old Red Sandstone on the southern shores of the eastern section. This is a site of significant ecological interest, with six habitats listed on Annex I of the E.U. Habitats Directive. Four of these are priority habitats - *Cladium* fen, alluvial woodland, limestone pavement and Yew woodland. Other annexed habitats present include alkaline fen and Juniper scrub formations on heath and calcareous grasslands. In addition, the lake itself is an SPA that supports important numbers of wintering wildfowl, Greenland White-fronted Goose, Common Tern

[2] https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY000231.pdf
[3] https://npws.ie/sites/default/files/protected-sites/synopsis/SY004058.pdf

and Cormorant, a number of which are listed under Annex I of the E.U. Birds Directive (NPWS, 2014b)[4].

3.1.2 Conservation Objectives of European Sites

European and national legislation places a collective obligation on Ireland and its citizens to maintain at favourable conservation status areas designated as SAC and SPA. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

Favourable conservation status of a habitat is achieved when:

- Its 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;
- 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 populations on a long-term basis.

The integrity of a European site (referred to in Article 6.3 of the EU Habitats Directive) is determined based on the conservation objectives and of the site. The Qualifying Interests (QI) and Special Conservation Interests (SCI) are obtained through a review of the most recently published (web-published or otherwise) Conservation Objective supporting documents and Site-Specific Conservation Objectives documents (where available) for the European site.

3.1.2.1 Conservation Objectives of European Sites within the proposed development's Zone of Influence

The Qualifying habitats and species of Interest for those European Sites within the project ZoI are listed in **Table 3-1**. Further details on Conservation Objectives for these European Sites are provided below.

Barroughter Bog SAC

The Site-Specific Conservation Objectives for the Lower River Shannon SAC are provided in the Conservation Objectives document available on the NPWS website, as follows;

https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000231.pdf

Lough Derg SPA

[4] https://npws.ie/sites/default/files/protected-sites/synopsis/SY002241.pdf

The generic conservation objectives for Lough Derg SPA are provided in the Conservation Objectives document available on the NPWS website, as follows;

https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004058.pdf

Lough Derg, North-East Shore

The Site Specific Conservation Objectives for the Lough Derg, North-East Shore SAC are provided in the Conservation Objectives document available on the NPWS website, as follows;

https://npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002241.pdf

4 EXISTING ENVIRONMENT

4.1 Features of Ecological Interest within the Study Area

The proposed accommodation bridge works are located along drainage channel within the northern extremities of Barroughter Bog. The existing accommodation bridge includes a culvert supported by a concrete deck, low concrete parapets and wingwalls. The accommodation bridge spans a small drainage channel of negligible to low flow, allowing the movement of livestock and small machinery either side of the channel. The channel is ca. 1.5m wide and 0.2m deep, widening further east / north-east of the bridge. The drainage channel drains towards the Kilcrow_070 watercourse to the east / north-east and the channel is a conduit of floodwaters from Lough Derg and the Kilcrow river during or following flood periods. Upstream of the bridge, the channel is encroached with aquatic macrophytes and ephemeral vegetation including bottle sedge (*Carex rostrata*), common club rush (*Schoenoplectus lacustris*) and occasional common reed (*Phragmites australis*), water horsetail (*Equisetum fluviatile*) and mare's tail (*Hippuris vulgaris*) in addition to fringing purple moor grass (*Molinia caerulea*), black bog rush (*Schoenus nigricans*), purple loosestrife (*Lythrum salicaria*) and the moss *Calliergonella cuspidata*.

The lands to the north of the existing accommodation bridge will support the site compound and the site access route. These lands comprise wet and tightly grazed dry neutral and calcareous grassland (GS1) / wet grassland (GS4) mosaic on peat soils with localised areas of outcropping limestone bedrock. These grassland areas support localised and spreading gorse (*Ulex europaeus*) scrub and individual hawthorn (*Crataegus monogyna*) shrubs. Plant species composition includes locally abundant carnation sedge (*Carex panicea*), Yorkshire fog (*Holcus lanatus*), creeping bent (*Agrostis stolonifera*), common rush (*Juncus effusus*), ladies smock (Cardamine pratensis), common sorrel (*Rumex acetosa*), crested dog's tail (*Cynosurus cristatus*), glaucous sedge (*Carex flacca*) and localised abundances of the moss *Calliergonella cuspidata*. The lands, particularly those areas located nearby the drainage channel support localised low lying runnels likely to support standing water during or following times when the channel has reached capacity.

The lands to the south of the accommodation bridge comprises heavily degraded, tightly grazed and dry raised bog in transition to wet grassland, with extensive and establishing and spreading gorse scrub. Areas not covered by gorse correspond to wet grassland on degraded peat and support abundant carnation sedge, common rush, purple moor grass, jointed rush (*Juncus articulatus*), lesser spearwort (*Ranunculus flammula*) and the mosses *Calliergonella cuspidata* and *Pseudoscleropodium purum*. Approximately 60m south of the accommodation bridge works, the lands are fenced off from sheep grazing and support degraded raised bog[5] with abundant purple moor grass, occasional to locally frequent ling heather (Calluna vulgaris) with spreading gorse, bracken (*Pteridium aquilinum*) and bramble (*Rubus fruticosus* agg.) Otter (*Lutra lutra*) were not identified along the upstream of downstream sections of the drainage channel during the site walkover survey. In addition, features such as scats, spraints, couches or holts were not identified along the watercourse or its immediate

[5] Corresponding with the degraded raised bog habitat '*Molinia caerulea* cutover bog LS3'.
Smith, G.F. & Crowley, W. (2020) The habitats of cutover raised bog. Irish Wildlife Manuals, No. 128. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.

environs. This watercourse does not provide suitable commuting, foraging and breeding habitat for otter. Avifauna identified within the watercourse and adjoining habitats during the site walkover survey are presented in **Table 4.1** below. This represents a typical range of avian fauna associated with degraded peatland habitats, adjoining woodland scrub and localised areas of wet grassland.

Table 4-1: Avifauna within the study area and environs

Species[6]	Comment
Linnet *Linaria cannabina*	Foraging within the scrub adjoining the study area.
Magpie *Pica pica*	Overflying the study area.
Dunnock *Prunella modularis*	Feeding and foraging within treelines and scrub adjoining the accommodation bridge.
Goldfinch *Carduelis carduelis*	Feeding and foraging within treelines and scrub adjoining the accommodation bridge.
Blue Tit *Cyanistes caeruleus*	Feeding and foraging within treelines and scrub adjoining the accommodation bridge.
Great Tit *Parus major*	Feeding and foraging within treelines and scrub adjoining the accommodation bridge.
Wren *Troglodytes troglodytes*	Feeding and foraging within treelines and scrub adjoining the accommodation bridge.
Robin *Erithacus rubecula*	Feeding and foraging within treelines and scrub adjoining the accommodation bridge.
Blackbird *Turdus merula*	Feeding and foraging within treelines and scrub adjoining the accommodation bridge.
Chaffinch *Fringilla coelebs*	Feeding and foraging within treelines and scrub adjoining the accommodation bridge.
Song Thrush *Turdus philomelos*	Feeding and foraging within treelines and scrub adjoining the accommodation bridge.
Snipe *Gallinago gallinago*	Flushed from wet grassland north of the accommodation bridge
Raven *Corvus corax*	Overflying the bridge site at height
Meadow Pipit *Anthus pratensis*	Foraging in nearby bog area

4.2 Geology, Hydrology and Hydrogeology

The Geological Survey of Ireland (GSI) online database was consulted for available edaphic, geological and hydrological information of the site and its environs. The underlying bedrock of the study area is underlain by the Ballysteen Formation, which supports Dark muddy limestone, shale. The groundwater vulnerability of the area surrounding the accommodation bridge works is classified as "Low". There are no karst features within the study area or its immediate surrounds. Bedrock aquifer maps published on the GSI website provide a detailed classification of bedrock aquifer types and

[6]Conservation status assigned by 'traffic light' system of colour coding, in accordance with the Birds of Conservation Concern in Ireland (Gilbert et al., 2021). Gilbert G, Stanbury A and Lewis L (2021), "Birds of Conservation Concern in Ireland 2020 –2026". Irish Birds 9: 523—544.
Red-listed species are of high conservation concern in Ireland, Amber-listed species are considered of medium conservation concern, while Green-listed species are not of conservation concern in Ireland at present.

indicate the bedrock aquifer beneath the site is classified as Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones.

The study site is located within the 'Tynagh' GroundWater Body (GWB) (IE_SH_G_236). This GroundWater Body was classified as Good Status in 2018 . Groundwater and surfacewater interactions of this GroundWater Body is described as follows '*Due to the shallow groundwater flow in this aquifer the groundwater and surface waters are closely linked. The streams crossing the aquifer are gaining. Many of the springs are located close to breaks of slope where the shallow groundwater intercepts the ground surface. There are several marshes and wetlands in the area. At Shannon Callows, there is a 'petrifying stream' with associated species-rich calcareous flush. Lough Derg, as well as receiving surface water input, will be sustained by groundwater flow. At most of the raised bogs designated as NHAs, groundwater upwells at the edges or in the middle of the bogs, and flushes the areas with mineral rich water. Swallow holes and caves accept point recharge from surface waters. Specific Dry Weather Flows of rivers flowing across ORS, and Lower and Upper Impure Limestone aquifers are low (0.47, 0.15 and 0.24 l/s/km^2 respectively). This indicates that aquifer storage is low and cannot sustain significant summer baseflows to the rivers'*.

Image 4-1: Upstream section of the existing accommodation bridge

Image 4-2: Upstream section of drainage channel spanned by the accommodation bridge

Image 4-3: Drainage channel located downstream of the accommodation bridge

Image 4-4: Downstream section of the existing accommodation bridge

	
Image 4-5: Areas of Barroughter Bog located to the south of the accommodation bridge	Image 4-6: Semi-improved grassland / access track located to the north of the accommodation bridge

5 STAGE 1 - SCREENING FOR APPROPRIATE ASSESSMENT

Table 5-1 presents Screening Assessment Criteria considering the proposed accommodation bridge works.

Table 5-1: Screening Assessment Criteria

Screening Assessment Criteria Screening Questions	Impacts
Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the European Sites.	The accommodation bridge works are located within Barroughter Bog SAC, representing direct connectivity to this European Site. The works also support indirect hydrological connectivity Lough Derg north-east shore SAC and Lough Derg SPA via the Kilcrow_070 watercourse. Given this connectivity (and viable source-pathway-receptor dynamic) between the accommodation bridge works and these European Sites, there is the potential for impacts possibly contributing toward negative effects, through vectors such as the operation of machinery and personnel within these European Sites, in the absence of best practice measures during the works. All other European Sites within the project zone of influence do not support connectivity via surfacewater, groundwater or other environmental vectors.
Likely direct, indirect or secondary impacts of the project on the European Sites:	
• Size and Scale	The size and scale of the proposed works are small and localised when compared with the surrounding environment and the size of European Sites within the project Zone of Influence.
• Land Take	As the proposed accommodation bridge works are located within the bounds of Barroughter Bog SAC. The proposed accommodation bridge works are unlikely to require or contribute land-take within this European Sites as it is proposed to replace and upgrade existing accommodation bridge infrastructure.
• Distance from European Sites or Key Features of the Site	The proposed accommodation bridge is located within Barroughter Bog SAC and supports

Screening Assessment Criteria Screening Questions	Impacts
	remote hydrological connectivity to Lough Derg SPA and Lough Derg north-east shore SAC, ca. 1.5km downstream.
• Resource Requirements	The proposed works will require the use of standard construction methods, including tracked machinery and hand-held tools.
• Emissions	Depending on the time of construction, there may be dust and water borne (silt laden waters, wet cement, hydrocarbons) emissions as a result of the proposed accommodation bridge works. There will be no operational phase emissions as a result of the proposed accommodation works.
• Excavation Requirements	Localised excavations within the accommodation bridge will be required during the project's construction phase. The will be no excavation requirements within habitats of qualifying interest for Barroughter Bog SAC. There will be no excavation requirements during the project's operational phase.
• Transport Requirements	Transport requirements as part of the proposed works will utilise the access track networks to the north of the site and open grassland north of the accommodation bridge works. Transport of works machinery and personnel will occur on an ad-hoc basis.
• Duration of construction, operation and decommissioning	Duration of the accommodation bridge works will be short term and; i.e. 1-2 weeks.
• Cumulative impact with other plans and projects in the area	As part of the AA, in addition to the proposed accommodation bridge works, other relevant projects and plans in the area must also be considered at this stage. These plans and projects are considered further in this respect in **Table 5-2** below.

Table 5-2: In-combination Effects associated with the proposed accommodation bridge works

Programmes, Plans and Projects	Key Policies/Issues/Objectives Directly Related to the Conservation of the Natura 2000 Network	Potential for In-combination Effects
Galway County Development Plan 2022-2028	**NHB 1 Natural Heritage and Biodiversity of Designated Sites, Habitats and Species** Protect and where possible enhance the natural heritage sites designated under EU Legislation and National Legislation (Habitats Directive, Birds Directive, European Communities (Birds and Natural Habitats) Regulations 2011 and Wildlife Acts) and extend to any additions or alterations to sites that may occur during the lifetime of this plan. Protect and, where possible, enhance the plant and animal species and their habitats that have been identified under European legislation (Habitats and Birds Directive) and protected under national Legislation (European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011), Wildlife Acts 1976-2010 and the Flora Protection Order (SI 94 of 1999). Support the protection, conservation and enhancement of natural heritage and biodiversity, including the protection of the integrity of European sites, that form part of the Natura 2000 network, the protection of Natural Heritage Areas, proposed Natural Heritage Areas, Ramsar Sites, Nature Reserves, Wild Fowl Sanctuaries (and other designated sites including any future designations) and the promotion of the development of a green/ ecological network. **NHB 2 European Sites and Appropriate Assessment** To implement Article 6 of the Habitats Directive and to ensure that Appropriate Assessment is carried out in relation to works, plans and projects likely to impact on European sites (SACs and SPAs), whether directly or indirectly or in combination with any other plan(s) or project(s). All assessments must be in compliance with the European Communities (Birds and Natural Habitats) Regulations 2011. All such projects and plans will also be required to comply	A number of strategies, policies and objectives are set out in the ***Galway County Development Plan 2022-2028*** with the aim of protection of the counties natural heritage and biodiversity. A number of policies and objectives provide for the protection of the integrity of sites designated under European and National legislation and ecological works. The Natural Heritage objective (NHB-1) highlights the council's policy to support the protection, conservation and enhancement of natural heritage and biodiversity, including the protection of the integrity of European sites. The adherence and implementation of this plan within the Development Plan area will ensure that European Sites are protected, and that Appropriate Assessment is undertaken for all plans, projects or programmes that have the potential for significant effects to European Sites.

Programmes, Plans and Projects	Key Policies/Issues/Objectives Directly Related to the Conservation of the Natura 2000 Network	Potential for In-combination Effects
	with statutory Environmental Impact Assessment requirements where relevant. **NHB 3 Protection of European Sites** No plans, programmes, or projects etc. giving rise to significant cumulative, direct, indirect or secondary impacts on European sites arising from their size or scale, land take, proximity, resource 198 requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall be permitted on the basis of this Plan (either individually or in combination with other plans, programmes, etc. or projects.	
River Basin Management Plan for Ireland 2022 – 2027	The Third Cycle Draft River Basin Management Plan 2022-2027 Consultation Report has been published. This report presents a summary of the issues raised in the submissions reviewed from the public consultation on the draft River Basin Management Plan for Ireland 2022-2027. The 3rd cycle of River Basin Management Plan (RBMP) for the period of 2022-2027 is currently being prepared by Department of Housing, Local Government and Heritage (DHLGH) in line with the EU Water Framework Directive (WFD) (2000/60/EC). Key issues raised as part of the consultation process within the ten most prominent themes are as follows. - Water Quality / Pollution - Agricultural Practices - Public Engagement and Awareness - Local Authority - Level of ambition	The implementation of the RBMP seeks compliance with the environmental objectives set under the plan, which will be documented for each water body. This includes compliance with the European Communities (Surface Waters) Regulations S.I. No. 272 of 2009 (as amended). The implementation of the RBMP and achievement or maintenance of environmental objectives which will be set for the receiving water bodies will have a positive impact on water dependent habitats and species within European Sites.

Programmes, Plans and Projects	Key Policies/Issues/Objectives Directly Related to the Conservation of the Natura 2000 Network	Potential for In-combination Effects
	- Sewage Pollution - Department / Agency - Co-ordination - Funding - Forestry - Peat - Shellfish waters / aquaculture - Other Following review of the submissions, the DHLGH will commence a review and where necessary update the draft RBMP with a view to finalisation and publication in Q3/Q4 of 2022. The SEA and AA processes will continue in parallel until finalisation and will be completed prior to adoption of the 3rd cycle plan.	
Inland Fisheries Ireland Corporate Plan 2021 -2025	IFI's Corporate Plan details the Inland Fisheries Ireland's, Vision, Mission and Values across seven strategic objectives for the period 2021 to 2025. Under each of the seven objectives a series of actions required to achieve the objectives are described, with the intended outcomes outlined. The strategic objectives outline where Inland Fisheries Ireland will focus their efforts between 2021 and 2025. Inland Fisheries Ireland will secure stakeholder feedback on the implementation of the Strategy mid-2023.	The implementation and compliance with key environmental issues and objectives of this corporate plan will result in positive in-combination effects to European sites. The implementation of this corporate plan will have a positive impact for biodiversity of inland fisheries and ecosystems. It will not contribute to in-combination or cumulative negative impacts with the proposed development.
Local Planning Applications	A search of Galway County Council's online planning enquiry database[7] was undertaken to identify other projects and plans consented within the past five	Adherence to the policies and objectives of the Galway County Development Plan 2022-2028

[7] http://gccapps.galway.ie/gis/cocomaps/

Programmes, Plans and Projects	Key Policies/Issues/Objectives Directly Related to the Conservation of the Natura 2000 Network	Potential for In-combination Effects
	years that are proximal or within the proposed development area. A small number of applications for dwellings, dwelling extensions and associated structures with granted planning permission were noted. These small-scale projects are not likely to cause effects to European sites when considered in combination with the current proposal under examination, either during the construction or operational phase. There is therefore no potential for significant in-combination effects of these developments with proposed development.	ensure that local planning applications and subsequent grant of planning comply with the core strategy of proper planning and sustainability and with the requirements of relevant EU Directives and environmental considerations, there is no potential for adverse in-combination effects on European Sites.

5.1.1 Conclusion of Cumulative Impact Assessment

Provided adherence to the overarching policies and objectives of the plans and programmes and best practice and mitigation measures are implemented for individual projects, there is no potential for the mentioned plans and projects to have a cumulative impact to European sites, in combination with the proposed accommodation bridge works.

Screening Assessment Criteria is further assessed in **Table 5-3** below.

Table 5-3: Screening Assessment Criteria

Screening Assessment Criteria **Screening Questions**	
Describe any likely changes to the site arising as a result of the following	
Reduction of Habitat	As the proposed works are located within the bounds of Barroughter Bog SAC, there is the potential for reduction of habitat within this SAC. However the proposed works footprint and its immediate environs do not support habitats of Qualifying Interest for this European Site. The proposed accommodation works support remote connectivity with Lough Derg (Shannon) SPA and Lough Derg north-east Shore SAC. The release of pollutants into the underlying drainage channel could be transmitted downstream to these European Sites in the absence of adequate best practice construction measures.
Disturbance to Key Species	The proposed works will not result in disturbance to SCI species associated within Lough Derg (Shannon) SPA as the works area and surrounds, do not provide suitable habitat for these species. Barroughter Bog SAC and Lough Derg north-east Shore SAC are designated for habitats of Qualifying Interest only. Therefore, the proposed works will not contribute disturbance to key species (or species of Qualifying Interest) for these European Sites.
Habitat or Species Fragmentation	The proposed works are located within the footprint of Barroughter Bog SAC. However, the proposed works footprint and the locations for ancillary works do not support habitats of qualifying interest for which this European Site has been designated. The proposed works require the replacement / upgrade of an existing accommodation bridge and therefore will not

Screening Assessment Criteria Screening Questions	
	contribute habitat or species fragmentation to this European Site. All other European Sites are located >1.5km from the proposed bridge works and will not be subject to habitat or species fragmentation.
Reduction in Species Diversity	The proposed works will not result in reduction in species diversity to SCI species associated within Lough Derg (Shannon) SPA as the works area and surrounds, do not provide suitable habitat for these species. Barroughter Bog SAC and Lough Derg north-east Shore SAC are designated for habitats of Qualifying Interest only. Therefore, the proposed works will not contribute disturbance or reduction to key species for these European Sites.
Changes in Key Indicators of Conservation Value	There is the remote potential for the proposed project to contribute localised ex-situ disturbance of species within the footprint of the proposed vegetation clearance works.
Climate Change	The proposed accommodation bridge works will not result in significant negative effects contributing to climate change that could in turn affect the conservation objectives of those European Sites within the project ZoI. The proposed works are small scale and localised and will not contribute significant emissions of additional greenhouse gases to the receiving and surrounding environment.
Describe any likely impacts on the European Sites as a whole in terms of Interference with key relationships that define the structure and function of the site;	The proposed accommodation bridge works may have the remote potential to provide contributory effects to European sites within the project Zone of Influence. This is due to the location of the proposed works within Barroughter Bog SAC and its remote connectivity with Lough Derg (Shannon) SPA and Lough Derg north-east shore SAC.
Provide Indicators of Significance as a result of the identification of effects set out above in terms of;	
Loss	As the proposed works are located within the bounds within Barroughter Bog SAC, there is the potential for direct and indirect loss of habitats within this European Site. However, the proposed works are small scale in nature and will be completed on habitats that do not

Screening Assessment Criteria Screening Questions	
	correspond with habitats of qualifying interest for Barroughter Bog SAC. There is the potential for indirect habitat loss or deterioration of downstream European sites (Lough Derg SPA & Lough Derg north-east shore SAC) from the effects of run-off or discharge into the aquatic environment through impacts such as increased siltation, nutrient release and/or contamination, particularly during the project construction phase.
Fragmentation	The proposed works are located within the footprint of Barroughter Bog SAC. However, the proposed works footprint and the locations for ancillary works do not support habitats of qualifying interest for which this European Site has been designated. The proposed works require the replacement / upgrade of an existing accommodation bridge and therefore will not contribute habitat or species fragmentation to this European Site. All other European Sites are located >1.5km from the proposed bridge works and will not be subject to habitat or species fragmentation.
Disruption	The proposed works may result in localised disruption and disturbance of lands within Barroughter Bog SAC. However, the proposed works are small scale in nature, targeted to the existing accommodation bridge and will be completed on habitats that do not correspond with habitats of qualifying interest for Barroughter Bog SAC. There is the potential for indirect habitat loss or disruption of downstream European sites from the effects of run-off or discharge into the aquatic environment through impacts such as increased siltation, nutrient release and/or contamination, particularly during the project construction phase.
Disturbance	
Changes to Key Elements of the Site	Changes to key elements of European Sites within the project Zone of Influence are highly unlikely. However, it is considered that the proposed works may contribute towards localised effects to the receiving and surrounding environment, such as disturbance

Screening Assessment Criteria Screening Questions	
	of adjoining, non-target habitats and the release of unattenuated water to downstream European Sites, including Lough Derg (Shannon) SPA and Lough Derg north-east Shore SAC. In addition construction phase elements of the project (in particular potential overland flow of construction stage pollutants to the underlying drainage channel and downstream sections of the Kilcrow_070 watercourse) may have the remote potential to contribute towards negative effects that may interfere with the structure and function of European sites within the project ZoI.
Describe from the above those elements of the project or plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts are not known	It is considered that the accommodation bridge works have the remote potential to provide contributory effects to European sites within the project Zone of Influence. Such impacts may include disturbance of habitats within Barroughter Bog SAC and the deterioration of water dependent habitats (with consequent effects on water dependent species) in the downstream European Sites; Lough Derg (Shannon) SPA and Lough Derg north-east Shore SAC.

An Impact Assessment of Features of Qualifying Interest for those European Sites within the project Zone of Influence is presented in **Table 5-4** below.

Table 5-4: Impact Assessment of Features of Qualifying Interest within the project Zone of Influence.

Features of Qualifying Interest	Likely Distribution[8] / Suitability of proposed works footprint to support Features of Qualifying Interest	Within the accommodation bridge works ZoI	Potential Impact Source	Description of Pathway	Potential Effect to Receptors
Barroughter Bog SAC (000231)					
7110 Active raised bogs 7120 Degraded raised bogs still capable of natural regeneration 7150 Depressions on peat substrates of the Rhynchosporion	These Annex I habitats are not located within the accommodation bridge works or its immediate environs. The proposed accommodation bridge works will be located on an existing drainage channel and are adjoined by areas of wet grassland and scrub on degraded peat (See **Section 4.1**).	These Annex I habitats are not located within the proposed works footprint or their immediate environs.	Use of excavators and other machinery. Use of hydrocarbons, aggregates and wet cement. Introduction and transmission of invasive plant species. Transmission of silt laden water from the works area to the surrounding area and downstream.	Air Noise Visual Overland flow	Direct and indirect disturbance of lands and habitats within the SAC, but not Annex I habitats of Qualifying Interest. Potential for indirect disturbance through run-off of potential pollutant sources to nearby / proximal areas of the SAC supporting

[8] Distribution analysis is informed from a site walkover survey of the proposed GI area and, in addition to distribution data presented in the Conservation Objectives supporting documents for these European Sites

Features of Qualifying Interest	Likely Distribution[8] / Suitability of proposed works footprint to support Features of Qualifying Interest	Within the accommodation bridge works ZoI	Potential Impact Source	Description of Pathway	Potential Effect to Receptors
					habitats corresponding with these Annex I qualifying habitats.
Lough Derg North-east Shore SAC (002241)					
5130 *Juniper communis* formations on heaths or calcareous grasslands 7210 Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae 7230 Alkaline fens 8240 Limestone pavements* 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)* 91J0 *Taxus baccata* woods of the British Isles*	These Annex I habitats are not located within the accommodation bridge works or its immediate environs. The proposed accommodation bridge works will be located on an existing drainage channel and are adjoined by areas of wet grassland and scrub on degraded peat (See **Section 4.1**). The drainage channel spanned by the proposed accommodation bridge works provides remote	These Annex I habitats are not located within the proposed works footprint or their immediate environs. The drainage channel spanned by the proposed accommodation bridge works provides remote and tenuous connectivity with this SAC and its component water dependent Annex I habitats.	Use of excavators and other machinery. Use of hydrocarbons, aggregates and wet cement. Introduction and transmission of invasive plant species. Transmission of silt laden water from the works area to the surrounding area and downstream.	Air Noise Visual Underlying drainage channel and downstream watercourses (Kilcrow_070 river) and waterbodies (Lough Derg)	Run-off of potential pollutant sources to the underlying drainage channel with subsequent deterioration to downstream water dependent Annex I habitats within this SAC; i.e. all habitats of Qualifying Interest except: *Juniper communis*

Features of Qualifying Interest	Likely Distribution[8] / Suitability of proposed works footprint to support Features of Qualifying Interest	Within the accommodation bridge works ZoI	Potential Impact Source	Description of Pathway	Potential Effect to Receptors
	and tenuous connectivity with this SAC.				formations on heaths or calcareous grasslands (5130) Limestone Pavements* (8240) & *Taxus baccata* woods of the British Isles* (9JJ0)
Lough Derg SPA (002241)					
A017 Cormorant *Phalacrocorax carbo* A061 Tufted Duck *Aythya fuligula* A067 Goldeneye *Bucephala clangula*	Common Tern is a migratory species, using Lough Derg to breed between spring and autumn. The proposed accommodation bridge works area, the underlying water channel	Cormorant, Tufted Duck and Goldeneye may utilise downstream parts of the Kilcrow_070 River and the adjoining areas of Lough Derg for foraging or commuting purposes.	Use of excavators and other machinery. Use of hydrocarbons, aggregates and wet cement. Introduction and transmission of invasive plant species.	Air Noise Visual Underlying drainage channel and downstream	Run-off of potential pollutant sources to the underlying drainage channel with subsequent deterioration to downstream water dependent

Features of Qualifying Interest	Likely Distribution[8] / Suitability of proposed works footprint to support Features of Qualifying Interest	Within the accommodation bridge works ZoI	Potential Impact Source	Description of Pathway	Potential Effect to Receptors
A193 Common Tern *Sterna hirundo*	and surrounding areas are unsuitable to support breeding or foraging Common Tern. Therefore this species is unlikely to be impacted by the proposed works. The remaining SCI species may utilise the downstream parts of the Kilcrow River at and near its confluence with Lough Derg. The proposed accommodation bridge works area, the underlying water channel and surrounding areas are unsuitable to support these SCI species.		Transmission of silt laden water from the works area to the surrounding area and downstream.	watercourses (Kilcrow_070 river) and waterbodies (Lough Derg)	SCI species utilising the Kilcrow_070 watercourse and Lough Derg.

Following the analysis presented in **Table 5-4** above, it is considered that the habitats of qualifying Interest of Barroughter Bog should be considered for further analysis, given the proposed works areas within this SAC. In addition, the proposed works support remote hydrological connectivity to Lough Derg north-east shore SAC and Lough Derg (Shannon) SPA and as a consequence may contribute indirect downstream impacts to the water dependent habitats and species of these European Sites.

5.2 Screening for AA Conclusion

This screening for AA identifies and assesses likely significant effects which are likely to occur as a result of the proposed accommodation bridge works. The screening identified three European sites within the potential source – pathway – receptor zone of influence of the proposed works.

The accommodation bridge works have the remote potential to provide contributory effects to European sites within the project Zone of Influence. Such impacts may include indirect disturbance of peatland habitats within the project zone of influence and the potential indirect impacts to water dependent habitats and species within downstream European Sites; Lough Derg north-east Shore SAC and Lough Derg (Shannon) SPA.

Therefore, it cannot be concluded, that the proposed project, individually or in combination with other plans or projects, will not have a significant effect on a European site, without the implementation of best practice measures. Therefore Stage 2 Appropriate Assessment is required.

A Natura Impact Statement (NIS) has been prepared in **Section 6**, to provide scientific examination of the project to enable completion of an AA by the competent authority. The NIS will examine potential effects to European Sites screened in as part of this Screening for Appropriate Assessment; Barroughter Bog SAC, Lough Derg (Shannon) SPA and Lough Derg north-east Shore SAC.

6 STAGE 2 – NATURA IMPACT STATEMENT

This section of the report provides the necessary information to inform AA to be completed by the competent authority, DAFM. This NIS provides the relevant scientific information to enable the competent authority in carrying out its AA to determine whether or not the accommodation bridge works would adversely affect the integrity of European sites.

The NIS assesses whether or not the accommodation bridge works would adversely affect the integrity of European Sites within the project ZoI, for which effects could not be excluded during the Screening for AA (see **Section 5** for details). The European Sites are as follows:

- Barroughter Bog SAC (000231);
- Lough Derg north-east Shore SAC (Site Code: 002241); and
- Lough Derg (Shannon) SPA (Site Code: 004058).

6.1 Impact Assessment

The impact assessment presented in the following sections outlines potential impacts and effects in the absence of mitigation measures being implemented.

6.1.1 Characterising Impacts

The methodology for the assessment of impacts is derived from the Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites (EC, 2002). When describing changes/activities and impacts on ecosystem structure and function, the types of impacts that are commonly presented include the following:

- direct and indirect effects,
- short- and long-term effects,
- construction, operational and deconstruction / demolition effects, and
- isolated, interactive and cumulative effects.

Impacts that could potentially occur through the implementation of the project can be categorised under a number of impact categories as outlined in the EC 2002 document as follows:

- Loss/Reduction of habitat area,
- Disturbance to key species,
- Habitat or species fragmentation,
- Reduction in species density, and
- Changes in key indicators of conservation value such as decrease in water quality and quantity.

Meaning of 'Adversely Affect the Integrity of the Site'

The concept of the 'integrity of the site' is explained in the EU publication Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, as follows;

'It is clear from the context and from the purpose of the directive that the 'integrity of the site' relates to the site's conservation objectives. For example, it is possible that a plan or project will adversely affect the integrity of a site only in a visual sense or only habitat types or species other than those listed in Annex I or Annex II. In such cases, the effects do not amount to an adverse effect for purposes of Article 6(3), provided that the coherence of the network is not affected. On the other hand, the expression 'integrity of the site'

shows that focus is here on the specific site. Thus, it is not allowed to destroy a site or part of it on the basis that the conservation status of the habitat types and species it hosts will anyway remain favourable within the European territory of the Member State.

As regards the connotation or meaning of 'integrity', this can be considered as a quality or condition of being whole or complete. In a dynamic ecological context, it can also be considered as having the sense of resilience and ability to evolve in ways that are favourable to conservation. The 'integrity of the site' has been usefully defined as 'the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or populations of species for which the site is or will be classified'

A site can be described as having a high degree of integrity where the inherent potential for meeting site conservation objectives is realised, the capacity for self-repair and self-renewal under dynamic conditions is maintained, and a minimum of external management support is required. When looking at the 'integrity of the site', it is therefore important to take into account a range of factors, including the possibility of effects manifesting themselves in the short, medium and long-term.

The integrity of the site involves its ecological functions. The decision as to whether it is adversely affected should focus on and be limited to the site's conservation objectives.

6.1.2 Potential for Direct Impacts

Direct impacts refer to habitat loss or fragmentation arising from land-take requirements for development purposes. The proposed works are located within the bounds of Barroughter Bog SAC and could result in the direct loss or disturbance to this European Site. However the proposed works footprint and its immediate environs do not support habitats of Qualifying Interest for this European Site.

6.1.3 Potential for Indirect Impacts

Indirect impacts refer to those which can arise through proximal or remote connectivity, for example by means of a watercourse, via overland flow of surfacewater, via groundwater, via air (e.g. dust) or via other emissions from a project site (e.g. noise and light). 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 roosting bats) or indirectly through noise, vibration and increased activity associated with construction activities or the operational processes of a proposed development.

6.1.4 Potential Effects from the Proposed Development to Conservation Objectives of Qualifying Habitats and Species to European Sites within the project Zone of Influence

Potential effects associated with the proposed development to the Qualifying Habitats and Species of European Sites within the project Zone of Influence are described in **Table 6-1** as follows:

Table 6-1: Impact Source – Pathway and Zone of Influence for the proposed project

Source of Potential Effect	Description of Pathway	Potential Zone of Influence of the Effect
Construction Phase		
Noise, vibration; Lighting; Human presence; and Movements of vehicles associated with construction activities.	Terrestrial - contact (direct contact with construction personnel or machinery during site works), air (through its ability to transmit noise effects), visibility (on site presence of construction personnel)	The Zone of Influence varies by the affected habitat and reliant species. This can be assessed within 500m of the proposed development footprint for wintering birds (see Madsen, 1985; Smit & Visser, 1993; and Rees et al., 2005). However, distance can be significantly lower (e.g. 150 m for otter underground sites (NRA, 2006), or higher for other species.
Earthworks / stripping of overburden (e.g. Digging); Over-pumping of silt laden waters Stockpiling of construction materials (sand, aggregates etc.) Use of contaminants (e.g. hydrocarbons, wet cement, lubricants).	Hydrological pathways; i.e. drainage channels and watercourses which provide connectivity with the downstream sections of the Kilcrow_070 and Lough Derg waterbodies. Surface water runoff; and Accidental spills.	The Zone of Influence of the potential effects associated with this source is related with the nature of the potential contaminant (e.g. silt, hydrocarbons). The worst case Zone of Influence is considered to be the whole length of the aquatic pathway (i.e. from the proposed development site to the downstream areas of Lough Derg north-east shore SAC).
Operational Phase		
Movement of People and vehicles associated within maintenance works; Maintenance of the bridge structure	Terrestrial - contact (direct contact with operational personnel or machinery during site works), air (through its ability to transmit noise effects), visibility (on site presence of construction personnel)	Such effects are not likely to be significant due to the nature and scale of the operational works and the intermittent, temporary and short duration of any potential maintenance works.
Use of contaminants (e.g. hydrocarbons, lubricants).	Hydrological pathways; i.e. drainage channels, streams and rivers which provide connectivity with downstream sections of the Kilcrow_070 and Lough Derg waterbodies.	The Zone of Influence of the potential effects associated with this source is related with the nature of the potential contaminant (e.g. silt, hydrocarbons). The worst case Zone of Influence is considered to be the whole length of the aquatic pathway (i.e. from the proposed development site to

Source of Potential Effect	Description of Pathway	Potential Zone of Influence of the Effect
		the in-situ areas of Barroughter Bog SAC.

6.1.5 Potential Impacts from the Proposed Development to the Features of Qualifying Interest of European Sites within the Project Zone of Influence

Potential impacts sources, pathways and consequent effects associated with the proposed accommodation bridge works to those features of Qualifying Interest of Barroughter Bog SAC, Lough Derg north-east Shore SAC and Lough Derg SPA are considered in greater detail in **Table 6.2** below.

Table 6-2 Impact Assessment on Features of Qualifying Interest for European Sites

Attribute/Measure/Target	Potential Impact of Proposed Accommodation Bridge works
Barroughter Bog SAC	
*7110 Active raised bogs**	
- Habitat area - Hectares - Restore area of active raised bog to 14.7ha, subject to natural processes	The proposed accommodation bridge works are located within the bounds of Barroughter Bog SAC. However the proposed works are located on an existing accommodation bridge structure spanning a drain of low / negligible flow, which in turn is adjoined by wet grassland and scrub mosaic on degraded peat soils. The proposed accommodation bridge works are located 350m north of Barroughter Bog SAC high bog area and will not lead to direct or indirect loss, disturbance or disruption of the high bog areas. The proposed accommodation bridge upgrade and refurbishment will match existing conditions with the existing culvert invert and soffit level being maintained. There will be no change to the hydrological functionality of the drain spanned by the accommodation bridge post refurbishment and consequently no changes to current areas of high bog or active raised bog.
- Habitat distribution - Occurrence - Restore the distribution and variability of active raised bog across the SAC.	The proposed accommodation bridge works are located within the bounds of Barroughter Bog SAC. However the proposed works are located on an existing accommodation bridge structure spanning a drain of low / negligible flow, which in turn is adjoined by wet grassland and scrub mosaic on degraded peat soils. The proposed accommodation bridge works are located 350m north of Barroughter Bog SAC high bog area and will not lead to direct or indirect loss, disturbance or disruption of the high bog areas or associated areas of active raised bog. The proposed accommodation bridge upgrade and refurbishment will match existing conditions with the existing culvert invert and soffit level being maintained. There will be no change to the hydrological functionality of the drain spanned by the accommodation bridge post refurbishment and consequently no changes to current areas of high bog or active raised bog.
- High bog area - Hectares	The proposed accommodation bridge works are located within the bounds of Barroughter Bog SAC. However the proposed works are located on an existing

Attribute/Measure/Target	Potential Impact of Proposed Accommodation Bridge works
- No decline in extent of high bog necessary to support the development and maintenance of active raised bog.	accommodation bridge structure spanning a drain of low flow, which in turn is adjoined by wet grassland and scrub mosaic on degraded peat soils. The proposed accommodation bridge works are located 350m north of Barroughter Bog SAC high bog area and will not lead to direct or indirect loss, disturbance or disruption of the high bog areas or associated areas of active raised bog.
- Hydrological regime: water levels - Centimetres - Restore appropriate water levels throughout the site	The proposed accommodation bridge upgrade and refurbishment will match existing conditions with the existing culvert invert and soffit level being maintained. There will be no change to the hydrological functionality of the drain spanned by the accommodation bridge post refurbishment and consequently no changes to ongoing hydrological regimes within the areas of high bog or active raised bog. It is not proposed to alter the hydrological functionality of the drainage channel and by extension alter drainage patterns within the surrounding or nearby areas of Barroughter Bog SAC.
- Hydrological regime: flow patterns - Flow direction; slope - Restore, where possible, appropriate high bog topography, flow directions and slopes.	
- Transitional areas between high bog and adjacent mineral soils (including cutover areas) - Hectares; distribution - Restore adequate transitional areas to support/protect active raised bog and the services it provides	The proposed bridge refurbishment will not impact the extent (in area) of transitional habitat between the high bog and adjacent mineral soils. The proposed accommodation bridge upgrade and refurbishment will match existing conditions with the existing culvert invert and soffit level being maintained. There will be no change to the hydrological functionality of the drain spanned by the accommodation bridge post refurbishment and consequently no changes to current areas of high bog, active raised bog or nearby transitional areas of the raised bog habitat.
- Vegetation quality: central ecotope, active flush, soaks, bog woodland - Hectares - Restore 7.4ha of central ecotope/active flush/soaks/bog woodland as appropriate	The proposed accommodation bridge works are located within the bounds of Barroughter Bog SAC. However the proposed works are located on an existing accommodation bridge structure spanning a drain of low / negligible flow, which in turn is adjoined by wet grassland and scrub mosaic on degraded peat soils. The proposed accommodation bridge works are located 350m north of Barroughter Bog SAC high bog area and ca. 500m north of areas mapped as active raised bog. The proposed bridge refurbishment and ancillary works will not lead to direct or indirect loss, disturbance or disruption of the high bog areas or associated areas of active raised bog, with any consequent effects to the vegetation quality (or proposed high bog restoration) of high bog areas or their associated ecotopes.
- Vegetation quality: microtopographical features - Hectares - Restore adequate cover of high quality microtopographical features	
- Vegetation quality: bog moss (*Sphagnum*) Species - Percentage cover	

Attribute/Measure/Target	Potential Impact of Proposed Accommodation Bridge works
- Restore adequate cover of bog moss (*Sphagnum*) species to ensure peat forming capacity	
- Typical ARB species: flora - Occurrence - Restore, where appropriate, typical active raised bog flora	The proposed accommodation bridge works are located within the bounds of Barroughter Bog SAC. However the proposed works are located on an existing accommodation bridge structure spanning a drain of low / negligible flow, which in turn is adjoined by wet grassland and scrub mosaic on degraded peat soils. The proposed accommodation bridge works are located 350m north of Barroughter Bog SAC high bog area and ca. 500m north of areas mapped as active raised bog. The proposed bridge refurbishment and ancillary works will not lead to direct or indirect loss, disturbance or disruption of the high bog areas or associated areas of active raised bog, with any consequent effects to the typical occurrence of ARB species within the high bog areas.
- Typical ARB species: fauna - Occurrence - Restore, where appropriate, typical active raised bog fauna	
- Elements of local distinctiveness - Occurrence - Maintain features of local distinctiveness, subject to natural processes	The proposed accommodation bridge refurbishment will not change elements of local distinctiveness within the high bog or transitional areas of Barroughter Bog SAC. The proposed works are located on an existing accommodation bridge structure spanning a drain of low / negligible flow, which in turn is adjoined by wet grassland and scrub mosaic on degraded peat soils. The proposed accommodation bridge works are located 350m north of Barroughter Bog SAC high bog area and ca. 500m north of areas mapped as active raised bog. The proposed bridge refurbishment and ancillary works will not lead to direct or indirect loss, disturbance or disruption of the high bog areas or associated areas of active raised bog, with any consequent effects to the vegetation quality (or proposed high bog restoration) of high bog areas or their associated ecotopes.
- Negative physical indicators - Percentage cover - Negative physical features absent or insignificant	The proposed bridge refurbishment and upgrade works will not contribute negative physical indicators within Barroughter Bog SAC. It is proposed to replace / refurbish an existing bridge within a marginal degraded areas of the SAC. The nature and scale of the proposed works are localised and small and will not change or alter negative physical indicators within the SAC.
- Vegetation composition: native negative indicator species - Percentage cover - Native negative indicator species at insignificant levels	The proposed accommodation bridge construction works could contribute to the introduction and potential spread of non-native invasive species, through the use of

Attribute/Measure/Target	Potential Impact of Proposed Accommodation Bridge works
- Vegetation composition: non-native invasive species - Percentage cover - Non-native invasive species at insignificant levels and not more than 1% cover	construction machinery and the import and utilisation of aggregate materials during the project construction phase.
- Air quality: nitrogen deposition - kg N/ha/year - Air quality surrounding bog close to natural reference conditions. The total N deposition should not exceed 5kg N/ha/yr	The proposed bridge refurbishment and upgrade works will not result or contribute changes to air quality within Barroughter Bog SAC. It is proposed to replace / refurbish an existing bridge within a marginal degraded areas of the SAC. The nature and scale of the proposed works are localised and small and will not contribute air quality impacts as a result of airborne emissions.
- Water quality - Hydrochemical measures - Water quality on the high bog and in transitional areas close to natural reference conditions	The proposed bridge upgrade works will not result in direct changes in water quality to the high bog and active raised bog areas of Barroughter Bog SAC. However, the proposed works could contribute water quality impacts to the underlying drainage channel which supports hydrological connectivity with the Kilcrow_070 watercourse and Lough Derg downstream. Water quality impacts to the Kilcrow_070 watercourse and Lough Derg could contribute indirect hydrological or hydrogeological impacts to the high bog areas of Barroughter Bog during or immediately following flood periods.
7120 Degraded raised bogs still capable of natural regeneration	
The long-term aim for Degraded raised bogs still capable of natural regeneration is that its peat-forming capability is re-established; therefore, the conservation objective for this habitat is inherently linked to that of Active raised bogs (7110) and a separate conservation objective has not been set in Barroughter Bog SAC.	The impact assessment process outlined above for the attributes listed for the 7110 active raised bog habitat are considered to be adequate for this degraded raised bog habitat. The proposed accommodation bridge works are located within the bounds of Barroughter Bog SAC. However the proposed works are located on an existing accommodation bridge structure spanning a drain of low / negligible flow, which in turn is adjoined by wet grassland and scrub mosaic on degraded peat soils. The proposed accommodation bridge works are located 350m north of Barroughter Bog SAC high bog area and will not lead to direct or indirect loss, disturbance or disruption of the high bog areas. In addition, the proposed accommodation bridge works or its immediate environs do not support habitats which correspond with this Annex I habitat.

Attribute/Measure/Target	Potential Impact of Proposed Accommodation Bridge works
	The proposed accommodation bridge upgrade and refurbishment will match existing conditions with the existing culvert invert and soffit level being maintained. There will be no change to the hydrological functionality of the drain spanned by the accommodation bridge post refurbishment and consequently no changes to current areas of high bog, active raised bog or degraded raised bog habitats within Barroughter Bog SAC.
7150 Depressions on peat substrates of the Rhynchosporion	
Depressions on peat substrates of the Rhynchosporion is an integral part of good quality Active raised bogs (7110) and thus a separate conservation objective has not been set for the habitat in Barroughter Bog SAC	The impact assessment process outlined above for the attributes listed for the 7110 active raised bog habitat are considered to be adequate for this degraded raised bog habitat. The proposed accommodation bridge works are located within the bounds of Barroughter Bog SAC. However the proposed works are located on an existing accommodation bridge structure spanning a drain of low / negligible flow, which in turn is adjoined by wet grassland and scrub mosaic on degraded peat soils. The proposed accommodation bridge works are located 350m north of Barroughter Bog SAC high bog area and will not lead to direct or indirect loss, disturbance or disruption of the high bog areas. In addition, the proposed accommodation bridge works or its immediate environs do not support habitats which correspond with this Annex I habitat. The proposed accommodation bridge upgrade and refurbishment will match existing conditions with the existing culvert invert and soffit level being maintained. There will be no change to the hydrological functionality of the drain spanned by the accommodation bridge post refurbishment and consequently no changes to current areas of high bog, active raised bog or degraded raised bog habitats within Barroughter Bog SAC.
Lough Derg north-east Shore SAC	
7210 Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae	
- Habitat area - Hectares	Remote potential for indirect hydrological impacts associated with the project construction phase (principally unattenuated surface water run-off during the

Attribute/Measure/Target	Potential Impact of Proposed Accommodation Bridge works
- Area stable or increasing, subject to natural processes	construction). Such impacts could contribute to changes (through habitat degradation and reduction) in area, extent and distribution of this QI habitat.
- Habitat distribution - Occurrence - No decline, subject to natural processes	
- Ecosystem function: peat formation - Percentage cover of peat-forming vegetation and water table levels - Maintain active peat formation, where appropriate	The nature of the proposed works and the remote hydrological connectivity between the proposed works, this European Site and associated areas of this habitat, means that the proposed works will not impact this habitat's peat formation capacity, surfacewater flows or groundwater levels.
- Ecosystem function: hydrology - groundwater levels - Water levels (centimetres); duration of levels; hydraulic gradients - Maintain, or where necessary restore, appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat	
- Ecosystem function: hydrology - surface water flow - Drain density and form Maintain, or where necessary restore, as close as possible to natural or semi-natural, drainage conditions	
- Ecosystem function: water quality - Water chemistry measures - Maintain appropriate water quality, particularly pH and nutrient levels, to support the natural structure and functioning of the habitat	Remote potential for indirect hydrological / water quality impacts associated with the project construction phase (principally unattenuated surface water run-off during the construction). Such impacts could contribute to changes to this habitat's water quality through run-off of construction phase pollutants.
- Vegetation composition: typical species - Percentage cover at a representative number of 2m x 2m monitoring stops - Maintain adequate cover of typical species, including brown mosses and vascular plants	The proposed accommodation bridge supports indirect hydrological connectivity associated with the project construction phase (principally unattenuated surface water run-off during the construction). Should the proposed works result in indirect water quality impacts, to downstream sections of this Annex I habitat, through runoff of construction phase pollutants, it could result in indirect impacts to the vegetation composition, due to eutrophication and reduction in habitat vegetation composition and diversity.
- Vegetation composition: native negative indicator species - Percentage cover at a representative number of 2m x 2m monitoring stops - Cover of native negative indicator species at insignificant levels	
- Vegetation composition: non-native species - Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops - Cover of non-native species less than 1%	
- Vegetation composition: trees and shrubs	

Attribute/Measure/Target	Potential Impact of Proposed Accommodation Bridge works
- Percentage cover in local vicinity of a representative number of monitoring stops - Cover of scattered native trees and shrubs less than 10%	
- Physical structure: disturbed bare ground - Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops - Cover of disturbed bare ground not more than 10%. Where tufa is present, disturbed bare ground not more than 1%	The nature of the proposed works and the remote hydrological connectivity between the proposed works and this European Site and Annex I habitat, means that the proposed works will not impact the physical structure of this habitat within the SAC.
- Indicators of local distinctiveness - Occurrence and population size - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat; maintain features of local distinctiveness, subject to natural processes	The proposed accommodation bridge supports indirect hydrological connectivity associated with the project construction phase (principally unattenuated surface water run-off during the construction). Should the proposed works result in indirect water quality impacts, to downstream sections of this Annex I habitat, through runoff of construction phase pollutants, it could result in indirect impacts to the vegetation composition and any associated rare threatened or scarce plant species, due to eutrophication and reduction in habitat vegetation composition and plant species diversity.
7230 Alkaline fens	
- Habitat area - Hectares - Area stable or increasing, subject to natural processes	Remote potential for indirect hydrological impacts associated with the project construction phase (principally unattenuated surface water run-off during the construction). Such impacts could contribute to changes (through habitat degradation and reduction) in area, extent and distribution of this QI habitat.
- Habitat distribution - Occurrence - No decline, subject to natural processes	
- Ecosystem function: soil nutrients - Soil pH and appropriate nutrient levels at a representative number of monitoring stops - Maintain soil pH and nutrient status within natural ranges	The nature of the proposed works and the remote hydrological connectivity between the proposed works, this European Site and associated areas of this habitat, means that the proposed works will not impact this habitat's peat formation capacity, surfacewater flows or groundwater levels.
- Ecosystem function: peat formation - Percentage cover of peat-forming vegetation and water table levels - Maintain active peat formation, where appropriate	
- Ecosystem function: hydrology - groundwater levels - Water levels (centimetres); duration of levels; hydraulic gradients	

Attribute/Measure/Target	Potential Impact of Proposed Accommodation Bridge works
- Maintain, or where necessary restore, appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat	
- Ecosystem function: hydrology - surface water flow - Drain density and form - Maintain, or where necessary restore, as close as possible to natural or semi-natural drainage conditions	
- Ecosystem function: water quality - Water chemistry measures - Maintain appropriate water quality, particularly pH and nutrient levels, to support the natural structure and functioning of the habitat	Remote potential for indirect hydrological / water quality impacts associated with the project construction phase (principally unattenuated surface water run-off during the construction). Such impacts could contribute to changes to this habitat's water quality through run-off of construction phase pollutants.
- Community Diversity - Abundance of variety of vegetation communities - Maintain variety of vegetation communities, subject to natural processes	The proposed accommodation bridge supports indirect hydrological connectivity associated with the project construction phase (principally unattenuated surface water run-off during the construction). Should the proposed works result in indirect water quality impacts, to downstream sections of this Annex I habitat, through runoff of construction phase pollutants, it could result in indirect impacts to the vegetation community diversity and composition, due to eutrophication and reduction in habitat vegetation composition and diversity.
- Vegetation composition: brown mosses - Percentage cover at a representative number of 2m x 2m monitoring stops - Maintain adequate cover of typical brown moss species	The proposed accommodation bridge supports indirect hydrological connectivity associated with the project construction phase (principally unattenuated surface water run-off during the construction). Should the proposed works result in indirect water quality impacts, to downstream sections of this Annex I habitat, through runoff of construction phase pollutants, it could result in indirect impacts to the vegetation composition, due to eutrophication and reduction in habitat vegetation composition and diversity.
- Vegetation composition: typical vascular plants - Percentage cover at a representative number of 2m x 2m monitoring stops - Maintain adequate cover of typical vascular plant species	
- Vegetation composition: native negative indicator species - Percentage cover at a representative number of 2m x 2m monitoring stops - Cover of native negative indicator species at insignificant levels	
- Vegetation composition: non-native species - Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops - Cover of non-native species less than 1%	
- Vegetation composition: native trees and shrubs	

Attribute/Measure/Target	Potential Impact of Proposed Accommodation Bridge works
- Percentage cover in local vicinity of a representative number of monitoring stops - Cover of scattered native trees and shrubs less than 10%	
- Vegetation composition: soft rush and common reed cover - Percentage cover in local vicinity of a representative number of monitoring stops - Total cover of soft rush (*Juncus effusus*) and common reed (*Phragmites australis*) less than 10%	
- Vegetation structure: litter - Percentage cover in local vicinity of a representative number of monitoring stops - Total cover of litter not more than 25%	
- Physical structure: disturbed bare ground - Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops - Cover of disturbed bare ground not more than 10%	The nature of the proposed works and the remote hydrological connectivity between the proposed works and this European Site and Annex I habitat, means that the proposed works will not impact the physical structure of this habitat within the SAC.
- Physical structure: tufa formations - Percentage cover in local vicinity of a representative number of monitoring stops - Disturbed proportion of vegetation cover where tufa is present is less than 1%	Changes to water quality as a result of the proposed works could affect and reduce the cover / abundance of tufa formations in downstream areas of this habitat.
- Indicators of local distinctiveness - Occurrence and population size - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat; maintain features of local distinctiveness, subject to natural processes	The proposed accommodation bridge supports indirect hydrological connectivity associated with the project construction phase (principally unattenuated surface water run-off during the construction). Should the proposed works result in indirect water quality impacts, to downstream sections of this Annex I habitat, through runoff of construction phase pollutants, it could result in indirect impacts to the vegetation composition and any associated rare threatened or scarce plant species, due to eutrophication and reduction in habitat vegetation composition and plant species diversity. The nature of the proposed works and the remote hydrological connectivity between the proposed works and this European Site and Annex I habitat, means that

Attribute/Measure/Target	Potential Impact of Proposed Accommodation Bridge works
	the proposed works will not impact the physical structure of this habitat within the SAC.
91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)	
- Habitat area - Hectares - Area stable or increasing, subject to natural processes.	Remote potential for indirect hydrological impacts associated with the project construction phase (principally unattenuated surface water run-off during the construction). Such impacts could contribute to changes (through habitat degradation and reduction) in area, extent and distribution of this QI habitat.
- Habitat distribution - Occurrence - No decline. The surveyed woodland areas at Bounla Island (NSNW site code 1950), Rinmaher (NSNW site code 1614) and Kylenamelly	
- Woodland size - Hectares - Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size	The proposed accommodation bridge supports indirect hydrological connectivity associated with the project construction phase (principally unattenuated surface water run-off during the construction). Should the proposed works result in indirect water quality impacts, to downstream sections of this Annex I habitat, through runoff of construction phase pollutants, it could result in indirect impacts to the woodland's structure (particularly community diversity), due to eutrophication and reduction in habitat vegetation composition and diversity. Other structural attributes such as flooding depth, dead wood, veteran trees, indicators of overgrazing and local distinctiveness will not be affected by the proposed works.
- Woodland structure: cover and height - Percentage; metres; centimetres - Total canopy cover at least 30%; median canopy height at least 7m; native shrub layer cover 10-75%; native herb/dwarf shrub layer cover at least 20% and height at least 20cm; bryophyte cover at least 4%	
- Woodland structure: community diversity and extent - Hectares - Maintain diversity and extent of community types	
- Woodland structure: natural regeneration - Seedling:sapling:pole ratio - Seedlings, saplings and pole age-classes of target species for 91E0* woodlands and other native tree species occur in adequate proportions to ensure survival of woodland canopy	
- Hydrological regime: flooding depth/height of water table - Metres - Appropriate hydrological regime necessary for maintenance of alluvial vegetation	
- Woodland structure: dead wood	

Attribute/Measure/Target	Potential Impact of Proposed Accommodation Bridge works
- Number per hectare - At least 19 stems/ha of dead wood at least 20cm diameter	
- Woodland structure: veteran trees - Number per hectare - No decline	
- Woodland structure: indicators of local disctinctiveness - Occurrence - No decline	
- Woodland structure: indicators of overgrazing - Occurrence - All five indicators of overgrazing absent	
- Vegetation composition: native tree cover - Percentage - No decline. Native tree cover at least 90% of canopy; target species cover at least 50% of canopy	The proposed accommodation bridge supports indirect hydrological connectivity associated with the project construction phase (principally unattenuated surface water run-off during the construction). Should the proposed works result in indirect water quality impacts, to downstream sections of this Annex I habitat, through runoff of construction phase pollutants, it could result in indirect impacts to the vegetation composition, due to eutrophication and reduction in habitat vegetation composition and diversity.
- Vegetation composition: typical species - Occurrence - At least 1 target species for 91E0* woodlands present; at least 6 positive indicator species for 91E0* woodlands present	
- Vegetation composition: negative indicator species - Occurrence - Negative indicator species cover not greater than 10%; regeneration of negative indicator species absent	
- Vegetation composition: problematic native species - Percentage Cover of common nettle (*Urtica dioica*) less than 75%	
Lough Derg SPA	
Objective: To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: A017 Cormorant *Phalacrocorax carbo* A061 Tufted Duck *Aythya fuligula* A067 Goldeneye *Bucephala clangula*	The proposed works are not located in proximity to this European Site. Therefore, the proposed works will not result in direct disturbance to the associated SCI species. In addition, the proposed accommodation bridge works area and surrounds do not provide suitable habitat for SCI species associated with this European Site. Therefore, indirect, ex-situ disturbance to SCI species associated with Lough Derg (Shannon) SPA is not likely.

Attribute/Measure/Target	Potential Impact of Proposed Accommodation Bridge works
A193 Common Tern *Sterna hirundo* Objective: To maintain or restore the favourable conservation condition of the wetland habitat at Lough Derg (Shannon) SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.	The proposed bridge accommodation works support remote indirect hydrological connectivity with this European Site via the underlying drainage channel and downstream sections of the Kilcrow_070 stream. The release of construction phase pollutants such as hydrocarbons, wet cement and fine aggregates into the underling drainage channel and subsequently downstream to the receiving areas of the Kilcrow_070 stream could contribute indirect water quality impacts to downstream areas of Lough Derg SPA. Such impacts could result in the deterioration of wetland habitat quality within Lough Derg with consequent effects to reliant SCI species. These wetlands support and provide valuable foraging / feeding habitat for the SCI species of this SPA.

The assessment completed in **Table 6.2** demonstrates that the proposed accommodation bridge works could lead to the reduction of water quality within the underlying drainage channel with the remote potential for indirect water quality impacts to downstream water dependent receptors and their associated attributes. Changes or reductions in downstream water quality through pollution or eutrophication could diminish habitat quality and species diversity in downstream water dependent Annex I habitats including areas of Calcareous fen, alkaline fen and alluvial woodland of Lough Derg north-east Shore SAC. In addition, water quality deterioration could result in the deterioration of wetland habitat quality within Lough Derg. These wetlands within and fringing Lough Derg support and provide valuable foraging / feeding habitat for the SCI species of this SPA.

6.2 Best Practice Design & Mitigation Measures

The best practice design and mitigation measures outlined below will be implemented to ensure that any impacts on the receiving environment, will be avoided during the project's construction phase. They will also ensure that all potential pollutant sources will be retained to the accommodation bridge works and will not enter the surrounding environment and those European Sites within the project Zone of Influence.

All works carried out during this project will be undertaken in accordance with OPW's Environmental Management Protocols & Standard Operating Procedures. (Refer to "OPW Environmental Guidance: Drainage Maintenance & Construction 2019"). Environmental Drainage Maintenance (EDM) Guidelines will be followed at all times. Furthermore, the proposed works practices will follow those measures and sequencing outlined in **Section 1.2**.

Mitigation refers to measures taken to avoid or reduce negative impacts and effects (CIEEM, 2018)[9].

The evaluation of likely significant impacts of the proposed development includes recommendations for specific measures to avoid and reduce any negative impacts of a project (i.e. mitigation measures). These measures are considered necessary to minimise environmental impacts associated with the proposed development. Avoiding and/or minimising negative impacts is best achieved through consideration of potential impacts of the proposed project from the initial stages.

To minimise environmental impacts, it is important in the first instance that the following general principles are taken on board:

- Implementation of good OPW work practices on site, in accordance with works methods outlined in Section 1.2.
- Working in accordance with relevant legislation, including that relating to invasive species.
- Operatives should ensure adequate site supervision and security.
- Operatives should be briefed to ensure that environmental issues are taken into consideration and that guidelines and codes of practice are followed.

6.2.1 Site Compound

A construction works compound with designated areas for the storage of building materials (sand, cement, additives, etc.), plant machinery and for delivery of materials and fuel shall be provided.

The general location of the construction works compound is illustrated on Figure 5 of the accompanying Method Statement (See **Appendix B**). The location of the works compound is proposed as it offers a location on semi-improved ground and allows for easy access to the site with minimum disruption to the nearby residential properties or adjacent habitats and the surrounding environment.

The majority of the works compound shall comprise semi-improved grassland areas north of the accommodation bridge works. Only where required, the works compound area shall be temporarily resurfaced by placing a geotextile membrane onto the existing surface onto which a 200mm hardcore surface shall be placed. The boundary of the site compound will be secured by silt fencing.

[9] CIEEM (2018). *The Guidelines for Ecological Impact Assessment in the UK and Ireland*

The location of the works compound is proposed as it offers a location on improved and allows for easy access to the site with minimum disruption to the nearby residential properties or adjacent habitats and the surrounding environment.

The following elements and designations shall be contained within the construction works compound:-

- Diesel generator;
- Temporary site office – Portakabin or similar;
- Employee Parking;
- Portaloo' type toilet facilities with suitable welfare and washing facilities. This will be positioned in the construction works compound. Any wastewaters generated from the construction works compound shall be discharged to self-contained storage tanks and shall be removed via a licenced contractor to a suitable wastewater disposal facility. No wastewaters generated within the works compound shall discharge to surface watercourses or to ground;
- Bunded re-fuelling area. It is not proposed to store any fuel, oils or chemicals within the construction works compound area or any other area within the site. Where re-fuelling of plant or machinery is required fuel will be delivered to site via a standard commercial fuel vehicle or a mobile fuel browser. Re-fuelling shall only be undertaken within the designated bunded refuelling area;
- Potable water supply to site office and welfare facilities.
- A water tanker to supply water used for other purposes;
- Designated areas for gravel, subsoil, topsoil and sand stockpiling; and
- Contractor lock-up facility.

6.2.2 Timing of Works

In accordance with Inland Fisheries Ireland guidance[10], instream works will be completed between July and September 2023. Works will coincide with late summer / early autumn months when water levels within the Kilcrow_070 watercourse and Lough Derg will be low and consequently the risk of high water levels within the drainage channel and adjoining lands will also be low. The proposed accommodation bridge works will not necessitate to removal of trees and shrubs and therefore, there will be no risk to nesting bird species. The proposed bridge footprint and ancillary works areas are not suitable for ground nesting birds due to the ongoing grazing regime within the site and the proximity of scrub habitats.

6.2.3 Accommodation Bridge Works Monitoring

The OPW will appoint an Environmental Officer from a member of their own ground staff or technical staff to oversee the appropriate implementation of the following mitigation measures. The OPW Environmental Guidance (Brew and Gilligan, 2019) will be strictly adhered to during these works. Ground staff and technical staff will set out all management works protocols in advance of their commencement and will maintain ongoing correspondence with landowners. They will ensure the successful implementation of all mitigation measures included in this NIS and will have the authority to stop works or temporarily halt or delay ongoing works where further consideration or on-site improvements of management measures may be necessary.

[10] Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries during construction works in and adjacent to waters.

6.2.4 Management of Machinery and associated Materials

The OPW will prepare and securely store all potential pollutants within the site compound.

- All refuelling operations and mechanical repairs should be carried out at least 50m from the nearest aquatic zone on a dry, elevated site. Where this is not possible, on-site refuelling will be undertaken with every precaution taken to avoid spillage including the use, where practicable of bunding, drip trays and absorbent materials.
- Spent oil must be collected and retained for correct off-site disposal.
- Where possible, biodegradable oil should be used as a substitute for mineral oil.
- A spill kit including absorbent material and floating booms will be on site with mechanical equipment at all times. The operators should be familiar with its use.
- Under no circumstances will chemicals, fuels or machine oils be discharged into an aquatic zone.
- Construction plant and equipment shall only be parked over-night within the construction works compound area. Construction plant and equipment shall be checked daily for any visual signs of oil or fuel leakage, as well as wear and tear.
- Waste oils, empty oil containers and other hazardous wastes will be disposed of in accordance with the requirements of the Waste Management Act, 1996.

6.2.5 Movement of Machinery onto and Within Sites

These measures are prescribed to reduce and remove the risk of disturbance to habitats adjoining the works area.

- As the works will be located during the summer months, it is not anticipated that the works areas will be wet or waterlogged. Nonetheless, as required access to and from works area within wet or partially waterlogged areas will be achieved using bog mats. The correct surface treatment should be utilised where possible to minimise damage to ground. It is considered that the EPDM type bog mats are likely to provide the best level of protection by reduction. Works with machinery within wet or waterlogged areas will be undertaken using bog mats.
- Every reasonable effort must be made to ensure that machinery do not cause rutting or become lodged.
- Where it is necessary to cross drains or wet areas, the most suitable area for crossing must be assessed. Where it is not possible or practicable to use existing crossing structures, crossing efforts will be completed using bog boards (heavy duty timber boards).
- Any dislodged soil is to be salvaged and reinstated with a digger. This will quickly re-establish and stabilise disturbed areas.

6.2.6 Protection of Soil, Surface Waters and Groundwater During Construction Stage

The following measures will be implemented to protect surface and groundwater during the project construction phase:

- All liquids, solids and powder containers will be clearly labelled and stored in sealable containers;
- All liquid and hazardous material will be stored in a designated and temporarily bunded area with appropriate signage. The temporary bunded area shall be located within the designated storage area located in the southern area of the site;
- There will be no discharge of effluent to groundwater or surface water during the construction phase. All wastewater from the construction facilities will be stored before removal off site for disposal and treatment;
- Spill kits will be provided in areas where liquids are stored and refuelling area;

- OPW personnel will be responsible for ensuring the regular maintenance of construction plant and equipment, to prevent leaks;
- Spill kits will be available to deal with accidental spillages;
- A regular review of weather forecasts for heavy rainfall will be required and the contractor will be required to prepare a contingency plan for before and after such events;
- The delivery point for concrete will be within the bunded designated construction compound area.
- Any compressors or generators used for connecting operations will be fitted with drip trays to collect any potential fuel and oil spills;
- Washing of tools or machinery with wet concrete will take place off-site at an appropriate dedicated wash facility that will pose no threat to surface waters;
- Overburden material shall only be stockpiled within a designated construction works compound area, and at least 10m metres from a watercourse. Separate stockpiles will be designated for different materials;
- Building materials (sand, aggregates etc) shall only be stockpiled within site compound and laid out to minimise exposure to wind;
- Works within the drainage channel will be completed under dry conditions. The channel will be dammed upstream and downstream of the accommodation bridge works and in-situ water will be pumped out as outlined in **Section 1.2.2** above. Dewatering of works-area/excavation will be carried out in accordance with EP15 Construction Silt Management[11].

6.2.7 Dust Control

To ensure mitigation of the effects of dust nuisance, a series of measures will be implemented. These area outlined below.

- Overburden material shall only be stockpiled within a designated construction works compound area. Separate stockpiles will be designated for different materials;
- All stockpiles on site will be covered with a waterproof cover to prevent mobilisation of the stockpile material. Stockpiled soils and aggregates will not be located within 10m of the drainage channels or other viable hydrological vectors within the proposed development site or its surrounding environs.
- Building materials (sand, etc) shall only be stockpiled within site compound and laid out to minimise exposure to wind. Sand and other aggregates will be stored in bunded areas and will not be allowed to dry out, unless this is required for a particular process. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods. Stored building materials (except blocks, bricks, etc) will be provided with water-proof covers when not being used. Bulk cement and other fine powder materials will be delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- No concrete production will take place on-site due to the sensitivity of the watercourses in the vicinity of the site. Concrete will be supplied to the site using ready mix lorries. No washing down of lorries or any other construction vehicles shall take place on-site;

[11] As presented in Brew, T., Gilligan, N., 2019, Environmental Guidance: Drainage Maintenance and Construction. Series of Ecological Assessments on Arterial Drainage Maintenance No 13. Environment Section, Office of Public Works, Trim, Co. Meath, Ireland.

- Where possible, concrete will be carefully placed by the use of a hydraulic pump to minimise the risk of concrete spillages. The ends of pump hoses will be secured during concreting to prevent the discharge hose accidentally depositing concrete away from the pour site;
- The delivery point for concrete will be within the bunded designated area. This will prevent potential concrete spillage from truck mixers contaminating the ground and leaching out into the groundwater. Compressors or generators used for connecting operations will be fitted with drip trays to collect fuel and oil spills that might otherwise contaminate the groundwater and lead to pollution of the watercourses;
- Concrete delivery vehicles will be precluded from washing out at or in the environs of the site, or at such location as would result in a discharge to surface waters;

6.2.8 Invasive Species

- Prior to arrival on site, the contractor's vehicles and equipment will be thoroughly cleaned and then dried using high-pressure steam cleaning, with water >65 °C, in addition to the removal of all vegetative material. Items difficult to soak/spray will be wiped down with a suitable disinfectant (e.g. solution of 1% Virkon® Aquatic);
- Ensure all operatives are familiar with all relevant non-native invasive species. A full list and details can be found on the Inland Fisheries Ireland website http://www.fisheriesireland.ie/Invasive-Species/invasive-species.html#help-us.
- Any aggregate imported to site will be subject to assessment, in order to identify any invasive alien species present. All aggregates imported to site will be certified and supplied by approved quarries. Subject to the identification of invasive alien species present at any of the sites, machinery will be cleaned between infested sites (including footwear and tools).
- Relevant guidelines on aquatic based biosecurity measures can be accessed from the Inland Fisheries Ireland website http://www.fisheriesireland.ie/Invasive-Species/invasive-species.html#help-us
- All construction staff to refer to OPW Environmental Guidance: Drainage Maintenance and construction 2019 re: EP'S 18A and 18B.

6.2.9 Other Legislation

- The works activities shall be carried out in such a manner as to prevent nuisance or pollution of any type, such as water, noise, odour, dust, visual, light, etc.
- The requirements of the Planning Acts, Public Health Acts, Fisheries Acts, Wildlife Acts, etc must be fully complied with.

6.2.10 OPW Standard Operating Procedures

In addition to the above best practice measures, the proposed works will be competed in accordance with the measures outlined in the 'OPW Environmental Guidance: Drainage Maintenance & Construction 2019".

6.2.11 Implementation of Mitigation Measures

The Mitigation Measures (Project Design measures, Management Plans, Environmental Emergency Procedures and Best Practice Measures) will be implemented by the Site Manager during the construction stage and the OPW's appointed Environmental Officer. Implementation of the Mitigation Measures, will be implemented under the proposed works plan and the OPWs Standard Operating Procedures.

All protection measures have been designed in line with Best Practice and constitute the Best Available techniques following scientific literature and field baseline verification. As such there is a very high degree of confidence in their likely success.

Implementation of the mitigation measures will be the responsibility of OPW and their appointed contractors. The supervision of the works will be carried out by ground staff and technical staff with experience in carrying out works on sensitive watercourses and will have 'stop works' authority.

6.2.12 Degree of confidence in the likely success of the mitigation measure

All protection measures have been designed in line with Best Practice and constitute the Best Available techniques following scientific literature and field baseline verification. As such there is a very high degree of confidence in their likely success.

6.2.13 How any mitigation failure will be addressed

The Mitigation measures prepared specifically for this project have been designed in line with Best Practice and constitute the Best Available techniques following scientific literature and Best Practice. The Mitigation Measures are considered to be robust and proven measures which will avoid adverse effects to European Sites.

On this basis, it can be confidently concluded that failures in the mitigation measures and their prescribed outcomes will be avoided.

Nonetheless contingency measures will be in place for unforeseen events such as oil/fuel spillages, water pollution or any inadvertent release of sediment. This will ensure any unforeseen potentially adverse effects are identified in a timely manner and appropriate remedial action taken immediately. The ground staff and technical staff with experience in carrying out works on sensitive watercourses will have 'stop works' authority. Where required, they will temporarily stop works should mitigation measures not be complied with or following an unforeseen environmental event. Works will not be allowed to re-commence until the issue is resolved.

7 NIS Conclusion

This Natura Impact Statement has been prepared to provide sufficient objective scientific information in support of the proposed development, in order to allow an Appropriate Assessment determination in the context of Article 6(3) of the Habitats Directive. The report has been prepared in order to evaluate the significance of potential effects on European sites from the proposed accommodation bridge works, alone and in-combination with other developments.

The AA Screening (see **Section 5**) found that it could not be excluded, on the basis of objective scientific information that the proposed works, individually or in combination with other plans or projects, would not have a potential contributory effect on a European site without the implementation of best practice measures and standard operating procedures being implemented. Therefore, a NIS (presented in **Section 6**) was undertaken to ascertain whether the proposed works would have an adverse effect on the integrity of European sites within the project ZoI.

Other relevant projects and plans within the project zone of influence that may give rise to in-combination effects was considered in Section 5 and Table 5.2. This assessment found that the proposed bridge accommodation works would not give rise to in-combination or cumulative effects to European Sites.

Best Practice Measures and Standard Operating Procedures for the proposed works (as outlined within **Section 6.2**) have been identified to ensure that potential pollutant sources are not released from the proposed works to the receiving environment. With the implementation of these measures there will be no risk of adverse effects on these Qualifying Features / Special Conservation Interests of European sites within this project's ZoI. As the proposed works are located within the footprint of Barroughter Bog SAC, other key measures include the OPWs standard best practice environmental control measures which aim to restrict the works to the project footprint to avoid the removal or disturbance of non-target habitat outside of the works area.

There are no significant effects identified which would adversely affect the Special Conservation Interests or conservation objectives of the various SPAs under consideration with regard to the densities, range or conservation status of the waterbird species and their supporting wetland habitats.

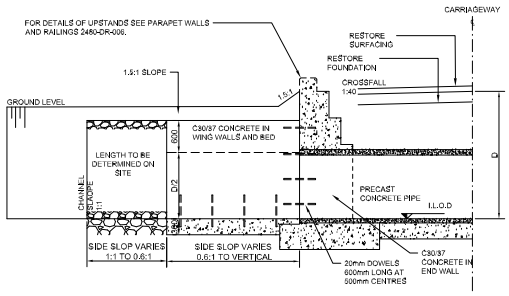
There are no significant effects identified which would adversely affect the Qualifying Interests or conservation objectives of the various SAC's under consideration with regard to the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.

The provisions of Article 6 of the 'Habitats' Directive 92/43/EC (2000) defines integrity as the 'coherence of the sites ecological structure and function, across its whole area, or the habitats, complex of habitats and/or population of species for which the site is classified'. It is clear that, given the application of prescribed protective measures for the avoidance of impacts and the implementation of the required mitigation measures, the proposed development will not give rise to adverse effects on the integrity of any of the identified European sites evaluated herein.

It has been concluded that the accommodation bridge works individually or in combination with other plans and projects will not adversely affect the integrity of a European site, and there is no reasonable scientific doubt in relation to this conclusion.

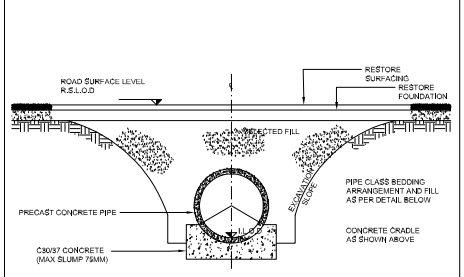
APPENDIX A – PROPOSED WORKS DRAWINGS

NOTES:
Figured dimensions only to be taken from this drawing, do not scale.

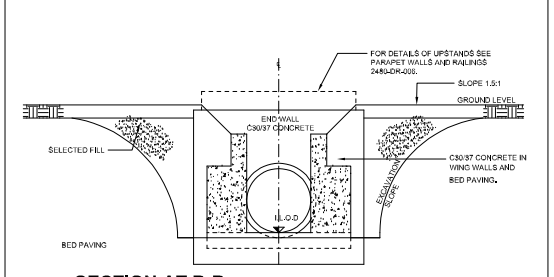


HALF LONGITUDINAL SECTION OF CENTRE LINE OF CULVERT

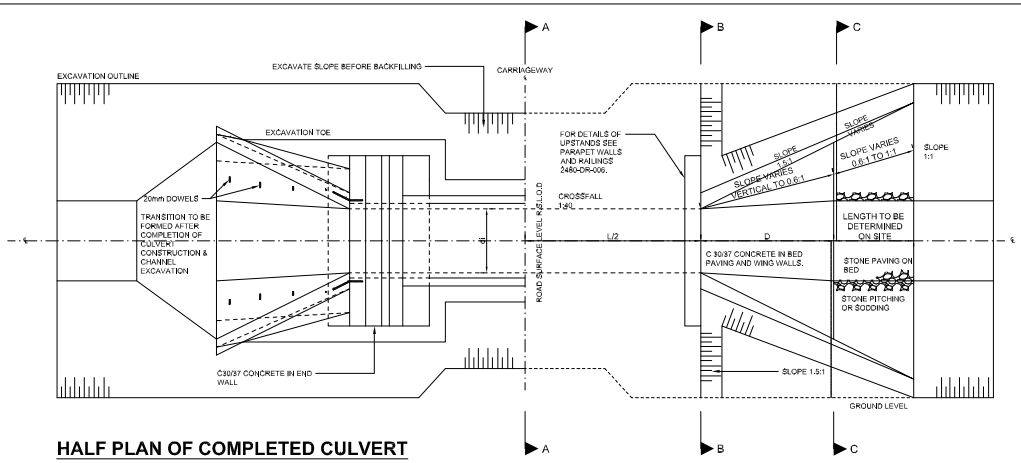
SHOWING ELEVATION OF WING WALLS
FOR DETAILS OF END WALL SECTIONS AND FOR "D" VALUES UP TO 3.0m SEE TYPICAL SECTIONS OF END WALL.



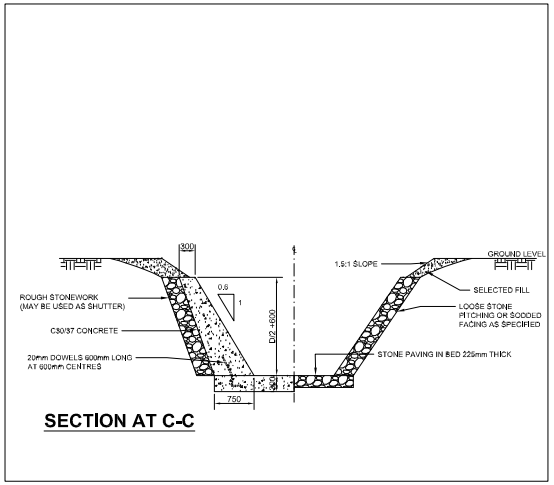
SECTION AT A-A



SECTION AT B-B



HALF PLAN OF COMPLETED CULVERT



SECTION AT C-C

THE PIPE CULVERT DESIGNS SHOWN ARE, WITH SPECIFIED VARIATIONS, APPLICABLE TO PUBLIC, PRIVATE AND FIELD ACCOMMODATION ROADS, EXCLUDING PUBLIC ROADS MORE THAN 2 LANES.

PARAPETS WHERE REQUIRED SHOULD BE SELECTED FROM THOSE SHOWN ON DRAWING 2480-DR-006 AND CONSTRUCTED IN ACCORDANCE WITH THE DETAILS SHOWN.

MINIMUM COVER DEPTHS (CROWN OF PIPE TO ROAD SURFACE LEVELS)
PUBLIC ROADS - 0.9M
PRIVATE AND FIELD ACCOMMODATION BRIDGES - 0.6M

VARIATIONS IN DIMENSIONS
THE VALUES OF THE VARIABLE BASIC DIMENSIONS INDICATED BY LETTER ON THE DRAWING SHALL AFFECT THE CULVERT DETAILS AS FOLLOWS:

LENGTH
THE LENGTH OF THE CULVERT ALONG CHANNEL IS NOT SUBJECT TO LIMITATION AND THE STRUCTURE AND WING WALL ARRANGEMENT CAN BE ADOPTED IRRESPECTIVE OF LENGTH.

DEPTH (D)
THIS IS DEFINED AS THE HEIGHT BETWEEN THE PIPE INVERT LEVEL AND THE CARRIAGEWAY SURFACE AND THE DESIGNS ARE APPLICABLE TO VALUES OF D UP TO A MAXIMUM OF 3 METRES. IT IS CONSIDERED GOOD PRACTICE TO SET THE PIPE INVERT AT LEAST 75MM BELOW THE CHANNEL INVERT AND THE SELECTED D VALUE SHOULD TAKE SUCH ADJUSTMENTS INTO ACCOUNT.

END WALL (SPANDREL) VARIABLE DIMENSIONS
THE SECTIONAL DIMENSIONS WILL VARY WITH D AS SHOWN ON THE DRAWING.
THE WIDTH W WILL VARY WITH D AS TABULATED BELOW

D	1.5m	2.0m	2.5m	3.0m
W	2.25m	2.75m	3.2m	3.7m

WING WALL VARIABLE DIMENSIONS
LENGTH AND HEIGHT SHALL BE RELATED TO D AS SHOWN ON THE DRAWING. THE TRANSITION LENGTH UPSTREAM AND DOWNSTREAM OF WING WALLS AND/OR THE NEED FOR CUT-OFF WALLS SHALL BE DETERMINED ON SITE.

PIPE BEDDING VARIABLE DIMENSIONS
WIDTHS AND THICKNESSES ARE RELATED TO do (PIPE BARREL DIAMETER) AND di (PIPE INTERNAL DIAMETER) AS SHOWN ON SECTIONAL DETAILS.

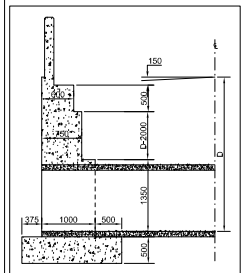
FOUNDATION PRESSURES
THE ARRANGEMENTS SHOWN FOR THE END WALL (SPANDREL) FOUNDATIONS SHOULD PRODUCE MAXIMUM FOUNDATION PRESSURES OF ABOUT 300KN PER SQUARE METRE AND ACCORDINGLY, CAN BE USED WITHOUT MODIFICATION WHERE SUBSTRATUM CONSISTS OF HARD CLAY OR COMPACTED SAND OR GRAVEL OR BETTER MATERIAL. FOR WEAKER BEARING CONDITIONS CONCRETE FOUNDATIONS UNDER PIPE SHOULD BE WIDENED TO do+100MM WITH A THICKNESS OF (di+do) ON EACH SIDE AND HAVE BOTTOM REINFORCEMENT OF 12MM BARS AT 300MM CENTRES EACH WAY (MINIMUM COVER 50MM), EXTENDING INTO SPANDREL WALL FOUNDATIONS. THIS WILL CATER FOR SAFE BEARING PRESSURES DOWN TO 100KN PER SQUARE METRE.

CONSTRUCTION JOINTS
CAST CONCRETE SHOULD BE SCABBLED AND CLEANED TO EXPOSE COARSE AGGREGATE.

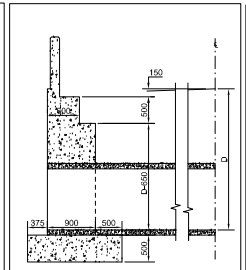
SUSTAINABILITY:
BRIDGE SHOULD BE CONSTRUCTED FROM CONCRETE MIX CONTAINING UP TO 50% GGBS WHERE AVAILABLE. PROVIDED MIX CAN MEET CONCRETE SPECIFICATION ON THIS DRAWING.

TYPICAL SECTION THROUGH END WALL FOR "D" RANGE UP TO 3.0m

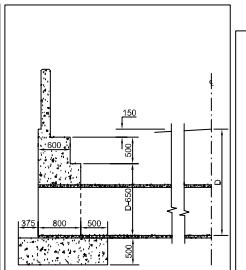
NOTE: - THESE SECTIONS DO NOT APPLY TO CASES INVOLVING SUPERELEVATION



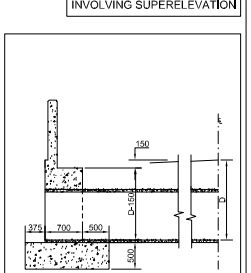
END WALL SECTION
FOR D = 2.5m to 3m



END WALL SECTION
FOR D = 2m to 2.5m



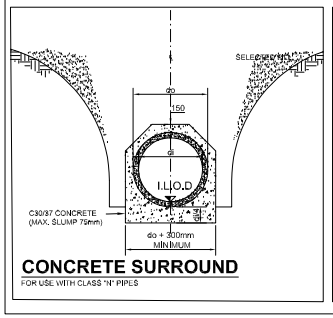
END WALL SECTION
FOR D = 1.5m to 2m



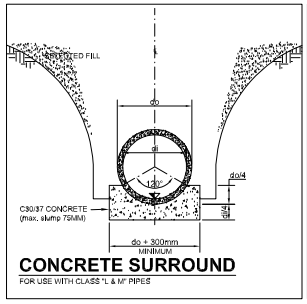
END WALL SECTION
FOR D = < 2m

ALTERNATIVE BEDDING ARRANGEMENTS

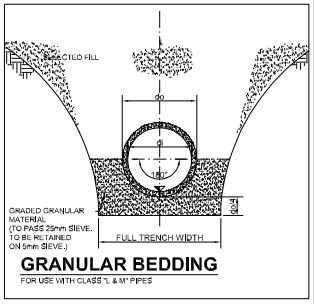
NOTE: - do = PIPE BARREL DIAMETER
di = PIPE INTERNAL DIAMETER



CONCRETE SURROUND
FOR USE WITH CLASS "N" PIPES



CONCRETE SURROUND
FOR USE WITH CLASS "L & M" PIPES



GRANULAR BEDDING
FOR USE WITH CLASS "L & M" PIPES

Rev	Date	Checked	Description
P2	11/09/15	TMcD	DRAWING UPDATED
P1	25/09/14	TMcD	NOTES UPDATED
P0	09/04/13	TMcD	PREPARED FOR COMMENT

O.P.W Engineering Services
Civil & Structural Engineering Services
Director of Engineering Services **Tony Smyth**
Assistant Chief Engineer **John Gallagher**
Grade 1 Engineer **Kieran Walsh**
Project Engineer **Tim McDonnell**
Telephone. +353 (0)1 6476000 Fax. +353 (0)1 6761714
E-mail engineering.services@opw.ie

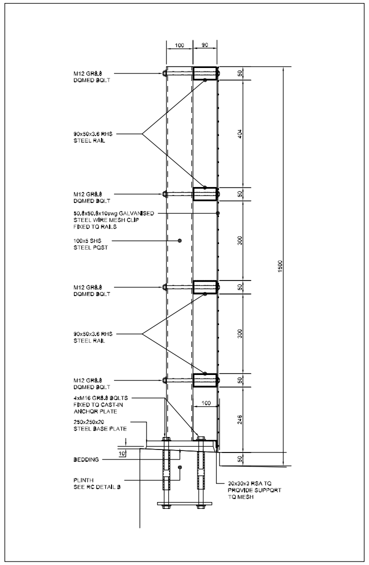
PROJECT
TYPICAL SMALL SPAN BRIDGE CONSTRUCTION

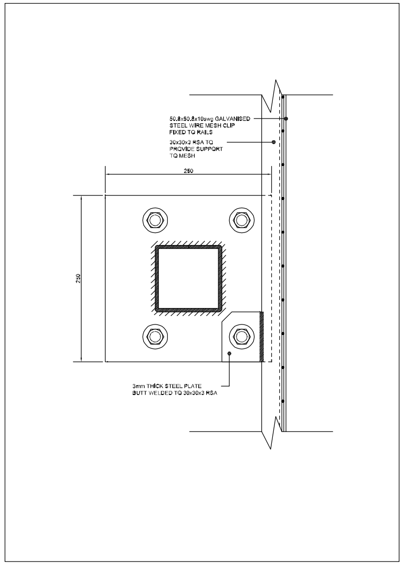
DRAWING
TYPICAL CONCRETE PIPE CULVERT CONSTRUCTION

Scales:	1:50
Date:	11/09/2015
Drawn:	JGH
Checked:	RW
Approved:	KW
Purpose of Issue:	By
PRELIMINARY DESIGN	Civil & Structural Engineering Services
CONSTRUCTION	
Drawing No:	2480-DR-003-P2

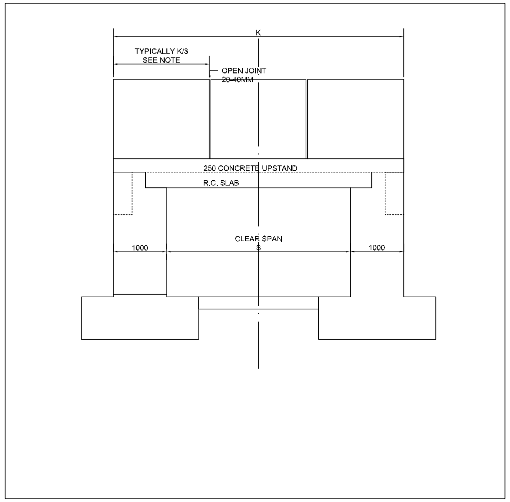
A1

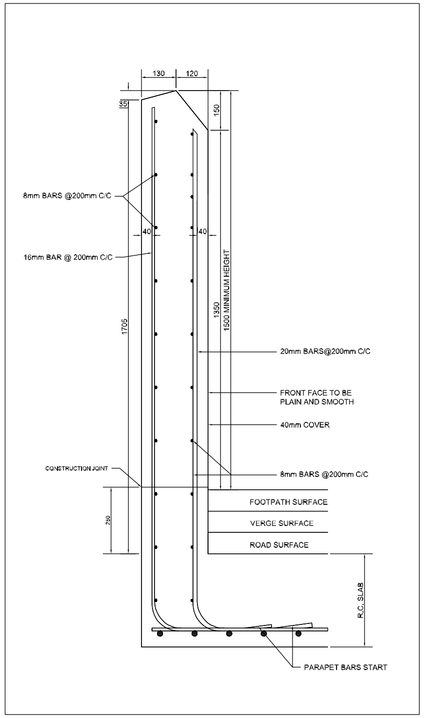
N1 TYPE PEDESTRIAN/VEHICLE STEEL PARAPET

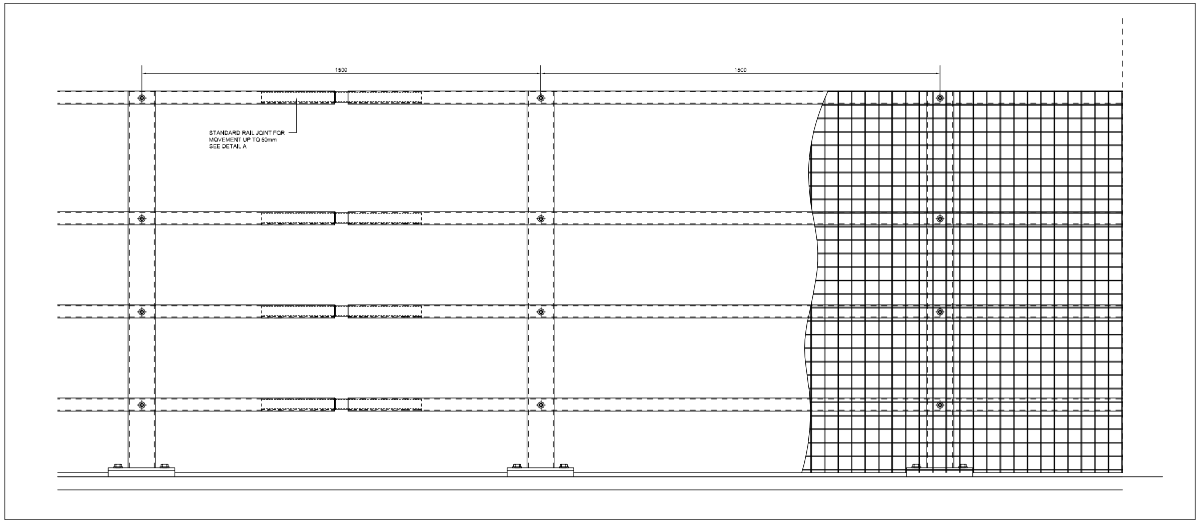


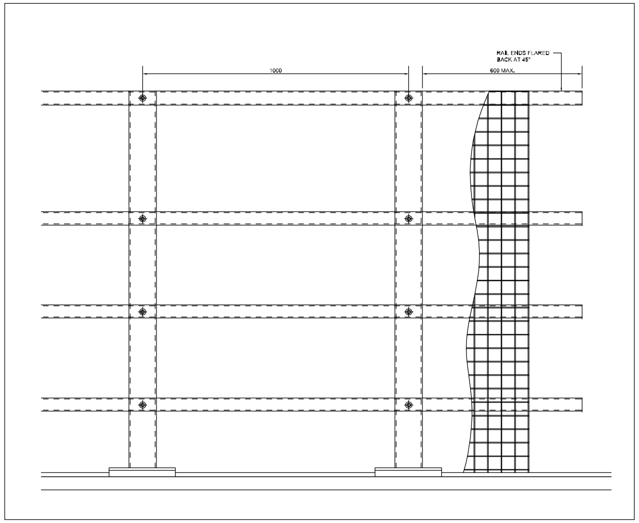


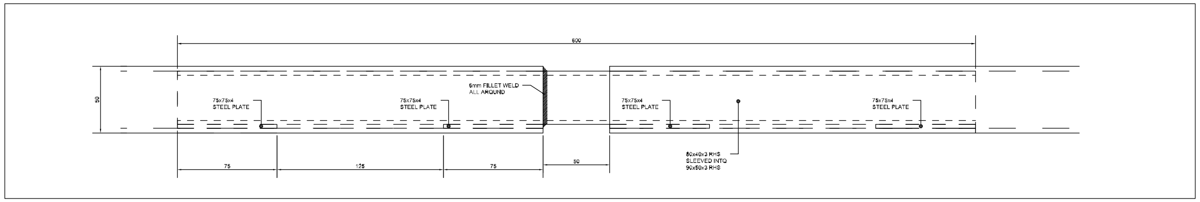
N1 TYPE PEDESTRIAN/VEHICLE CONCRETE PARAPET

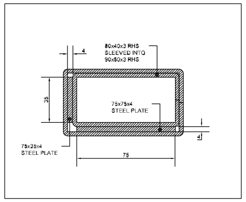












NOTES:

FOR SETTING OUT, SEE INDIVIDUAL PROJECT DRAWINGS.
FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING, DO NOT SCALE.

1. GENERAL
THIS DRAWING GIVES DETAILS OF PARAPET CONSTRUCTION. THE DESIGNS ARE BASED ON THE NRA PUBLICATION: DESIGN MANUAL FOR ROADS AND BRIDGES NRA BD 52/13 VEHICLE AND PEDESTRIAN PARAPETS. DESIGNS SHOWN ON THIS DRAWING ARE TO PROVIDE N1 AND N2 LEVELS OF CONTAINMENT RESPECTIVELY FOR VEHICLE BRIDGES. ADDITIONAL DESIGNS FOR PEDESTRIAN ONLY BRIDGES ARE ALSO GIVEN.

2. THE BRIDGE PARAPETS ON THIS DRAWING ARE NOT SUITABLE FOR BRIDGES OVER RAILWAYS.

IN ORDINARY CIRCUMSTANCES, VEHICLE PARAPETS SHALL BE A PRODUCT THAT HAS BEEN FULLY CRASH TESTED IN ACCORDANCE WITH IS EN 1317-2 AND MEET THE ACCEPTANCE CRITERIA OF IS EN 1317-2 FOR THE PERFORMANCE REQUIREMENTS SPECIFIED BELOW. IN OTHER CIRCUMSTANCES THE DESIGNED PARAPETS ON THIS DRAWING MAY BE USED.

2. TYPES OF CONSTRUCTION
N1: REINFORCED CONCRETE
N4: STRUCTURAL STEEL OR MASS CONCRETE

STRUCTURAL STEEL DESIGNS FOR N1 PARAPETS SHOULD BE SUBJECT TO AN INDIVIDUAL DESIGN

3. MINIMUM HEIGHT
THE FINISHED PARAPET MUST BE AT LEAST: 1.25M ABOVE THE FINISHED SURFACE OR FOOTPATH FOR VEHICLE AND PEDESTRIAN BRIDGES, 1.4M ABOVE FOR CYCLEWAYS, 1.5M ABOVE FOR ACCOMMODATION BRIDGES AND 1.85M ABOVE FOR BRIDLEWAY BRIDGES

4. APPROACH FENCING
THE NEED OR OTHERWISE FOR SAFETY FENCING SHOULD BE THE SUBJECT OF CONSULTATION WITH THE RELEVANT LOCAL AUTHORITY

5. MATERIALS AND WORKMANSHIP SPECIFICATION
BRIDGES, PARAPETS, ABUTMENTS AND ASSOCIATED STRUCTURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE ACCOMPANYING SPECIFICATION

6. SUSTAINABILITY
BRIDGE SHOULD BE CONSTRUCTED FROM CONCRETE MIX CONTAINING UP TO 50% GGBS WHERE AVAILABLE, PROVIDED MIX CAN MEET CONCRETE SPECIFICATION ON THIS DRAWING,

MINIMUM PARAPET CONTAINMENT LEVELS FOR VEHICLES

LOCATION	MINIMUM PARAPET CONTAINMENT LEVEL
All structures in urban areas where the legal speed limit is 60kph or less, except where: • The structure crosses or adjoins a motorway or railway. • The structure is on a horizontal curve and / or gradient and the radius and / or gradient does not comply with relevant desirable minimum standards (Relevant desirable minimum standards are described in NRA TD 9). All accommodation bridges serving a single landholding except accommodation bridges over the railway.	N1
All structures not otherwise explicitly dealt with in this table	N2
All structures carrying a motorway and crossing or adjoining another national route. All structures forming part of partially or fully free flow interchanges. All structures carrying a national or regional road where the geometric alignment does not comply with relevant desirable minimum standards within a distance of 215m of either approaches to the structure (Relevant desirable minimum standards are described in NRA TD 9).	H2
All structures crossing or adjoining a railway.	H2a

Rev	Date	Checked	Description
P1	25/09/14	TMcD	NOTES UPDATED
P0	09/04/13	TMcD	PREPARED FOR COMMENT

O.P.W Engineering Services
Civil & Structural Engineering Services
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PROJECT
TYPICAL SMALL SPAN BRIDGE CONSTRUCTION

DRAWING
PARAPET CONSTRUCTION
FOR USE IN CONJUNCTION WITH STANDARD BRIDGE AND CULVERT DESIGN

Scales:	1:50
Date:	25/09/2014
Drawn:	JGill
Checked:	RW
Approved:	KW
Purpose of Issue:	By
PRELIMINARY DESIGN	Civil & Structural Engineering Services
CONSTRUCTION	
Drawing No:	2480-DR-006-P1

OPW The Office of Public Works

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APPENDIX B – WORKS METHOD STATEMENT

Scheme:	**Killimor Arterial Drainage Scheme**
Project:	**Accommodation Bridge Replacement @ B58, C1/1/1 – 400 Chainage**
Site Location:	**Stonyisland, Portumna, Co. Galway (53.0848, -8.3107) (Long, Lat)**

1 Outline of Proposed Works

This Method Statement refers to proposed works on the OPW's Killimor Arterial Drainage Scheme. The proposed work includes the refurbishment of an existing accommodation bridge and extension of the bridge on the downstream side using 0.9m diameter precast concrete pipe culverts. Works will also involve installing new wingwalls, 2 new pre-cast concrete parapets and bridge deck. Work will be delivered in accordance with the OPW Standard Design. (Drawing Refs 2480-DR-003-P2 & 2480-DR-006-P1). Precast concrete pipes will be used to reduce the requirement for in-situ concrete works.

The site is located immediately off the L-87851-0 and accessed via a local field gate entrance. See figure 5 for information.

Works on site will typically be carried out during standard OPW hours re: 08:00 – 16:30. Channel C1/1/1 Stonyisland, Portumna – B58 @ Chainage 400 has a base width of less than 3m and is therefore classified as a minor channel for arterial drainage purposes. The flow and water levels in the channel will vary depending on recent rainfall patterns and time of year works are being undertaken. It is intended to carry out works in July/August 2023.

Please Note: This method statement should be read in parallel with the completed OPW Project Risk Assessment Form and all relevant project drawings, specifications, schedule of commitments, construction & environmental management plan etc. TBT Covid-19 Site Safety Induction Shall also be carried out before work commences.

If any issue within this method statement, or during the progression of the works requires needs clarification, the appropriate supervisor should be contacted immediately.

Inland Fisheries Ireland are consulted on all proposed programmed works prior to any construction commencing on site.

Site Location

Bridge B58 is located on OPW channel C1/1/1 (Chainage 400) in Stonyisland, Portumna, Co. Galway. GPS Coordinates (53.0848, -8.3107). See figures 1 and 2 for information.

Scheme:	**Killimor Arterial Drainage Scheme**
Project:	**Accommodation Bridge Replacement @ B58, C1/1/1 – 400 Chainage**
Site Location:	**Stonyisland, Portumna, Co. Galway (53.0848, -8.3107) (Long, Lat)**

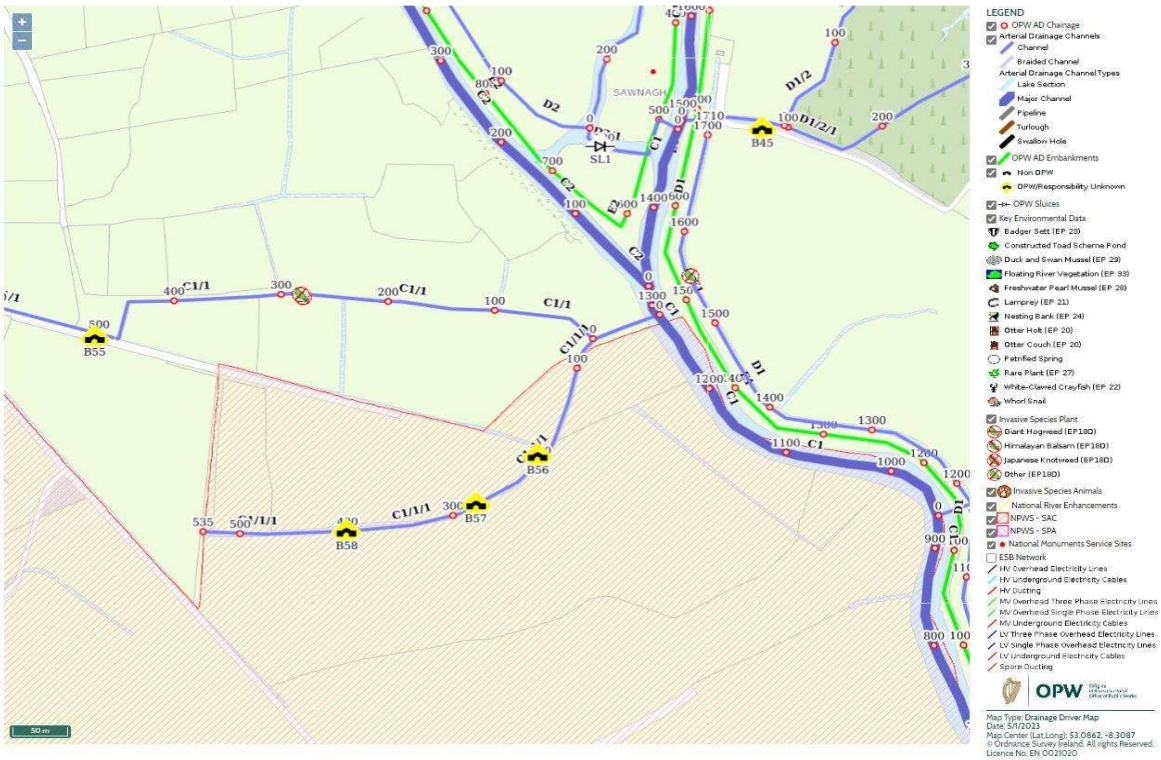

Figure 1: Location Map With OPW Infastrucute Included - Environmental Viewer

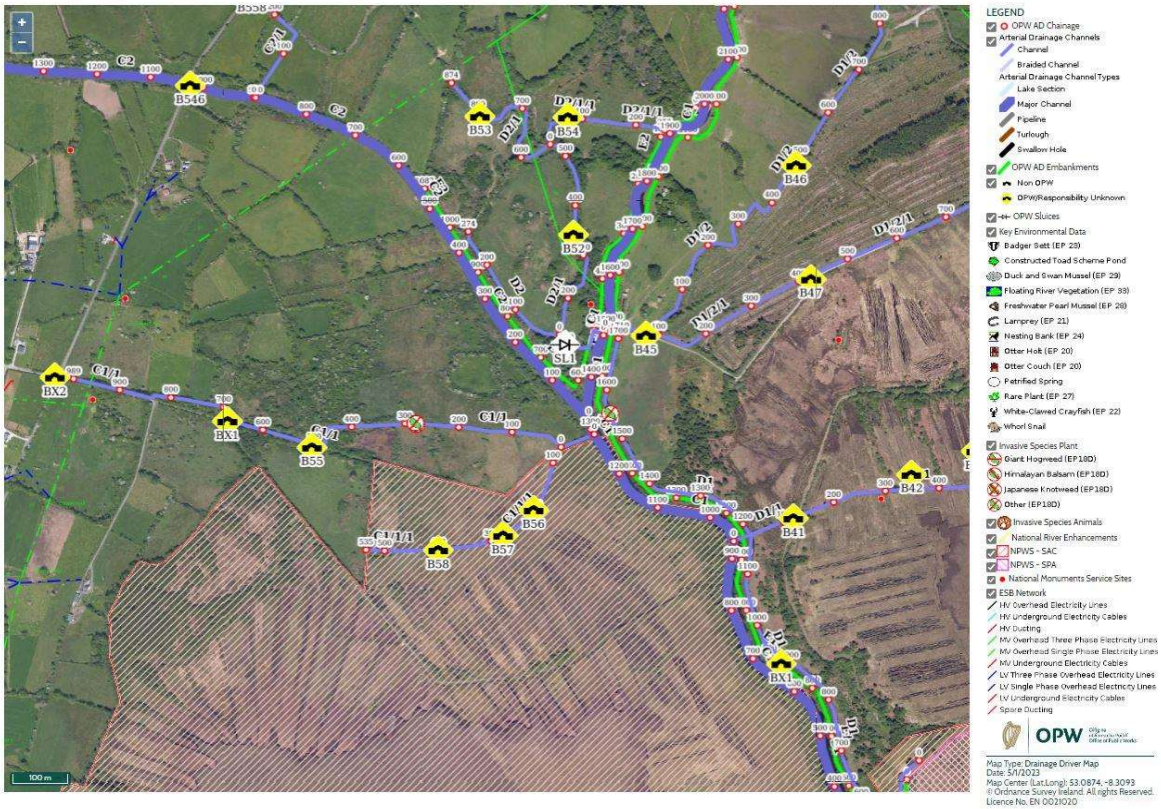

Figure 2: Location Map With OPW Infastrucute Included – Aerial Imagery

Scheme:	**Killimor Arterial Drainage Scheme**
Project:	**Accommodation Bridge Replacement @ B58, C1/1/1 – 400 Chainage**
Site Location:	**Stonyisland, Portumna, Co. Galway (53.0848, -8.3107) (Long, Lat)**

Figure 3: B58 on OPW Channel C1/1/1

Figure 4: B58 on OPW Channel C1/1/1

Scheme:	**Killimor Arterial Drainage Scheme**
Project:	**Accommodation Bridge Replacement @ B58, C1/1/1 – 400 Chainage**
Site Location:	**Stonyisland, Portumna, Co. Galway (53.0848, -8.3107) (Long, Lat)**

Proposed Site Layout

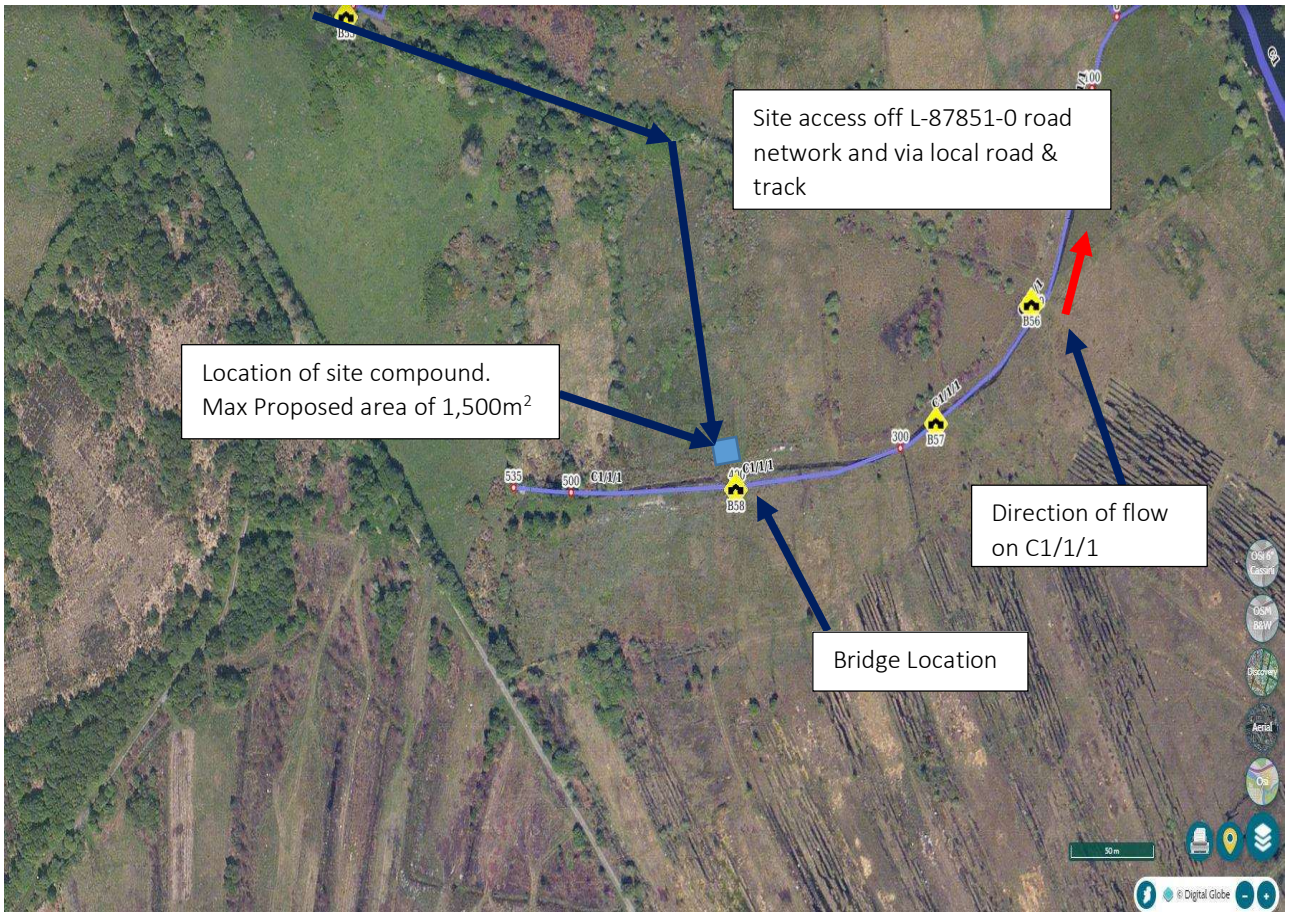

Figure 5: Proposed site layout & site access

3 EQUIPMENT REQUIRED

	Quantity	Description	OPW	Hired
Major Plant	1	14T Hydraulic Excavator	✓	
	1	Artic Truck & Low-loader	✓	
	1	Tractor & Trailer	✓	

Scheme:	**Killimor Arterial Drainage Scheme**
Project:	**Accommodation Bridge Replacement @ B58, C1/1/1 – 400 Chainage**
Site Location:	**Stonyisland, Portumna, Co. Galway (53.0848, -8.3107) (Long, Lat)**

	1	Site/Track Dumper	✓	
	1	6T Mini-Digger		
Small Plant/Tools	**Quantity**	**Description**	**OPW**	**Hired**
	1	Concrete Poker Vibrator	✓	
	1	4 or 6" Water Pump	✓	
Other Essential Equipment	Life Rings/Buoys Lifting Chains / Slings			

4 Materials Required

Quantity	Description	Notes
T.B.C	Formwork (Peri Formwork)	
T.B.C	Ready-Mix Concrete	As per Design Drawing
2 No.	Concrete pipe culverts – 1M Lengths	
2 No.	Steel – A393 Mesh	
2 No.	Pre-cast concrete parapets	

5 Health & Safety

All site operatives must read, and sign, the specific OPW Project Risk Assessment & Safety Plan relating to this project.

The Foreman will advise of any other relevant Health & Safety issues or procedures which must be followed during the construction works.

All works carried out on this project and site are to be carried out in accordance with the relevant OPW Risk Assessments and Safety Procedures. A copy of these documents will be available in the Site Office. All operatives are to ensure they are familiar with all of these procedures prior to commencing works.

Mechanical plant used on site during these works is restricted to plant approved in advance by OPW Mechanical Engineering staff and may vary depending on requirements.

Should any member of staff observe a Health and Safety issue during the course of this construction project, they must immediately inform their supervisor of their concern.

Scheme:	**Killimor Arterial Drainage Scheme**
Project:	**Accommodation Bridge Replacement @ B58, C1/1/1 – 400 Chainage**
Site Location:	**Stonyisland, Portumna, Co. Galway (53.0848, -8.3107) (Long, Lat)**

5.1 Establishment of Health & Safety Controls

The site will be prepared initially to ensure the security and safety of the site. This will include preparation of the access route, installation of fencing, gates, safety barriers & environmental barriers, where required.

A small site compound containing a steel container and eating facilities will be used to service works. Designated areas within the Site Compound will be established for welfare facilities, materials storage, vehicle parking and plant storage. See figure 5 for details.

All health and safety controls identified in the OPW Project Risk Assessment & Safety Plan shall be established **BEFORE** any construction works commence. This will include signage, fencing, access/egress route, secure access ladders, barriers etc.

All operatives, and visitors to site, are required to wear appropriate PPE at all times. All OPW employees must comply with existing Covid-19 regulations and requirements.

Visitors to site shall inform the Site Foreman/Supervisor of their presence. Operatives working on the site shall escort any visitors to the Site Foreman/Supervisor immediately upon observing a visitor to the site. The site supervisor will deliver a site induction to any visitors upon their arrival to site.

Good housekeeping procedures on the site shall be followed at all times. Materials will be stored tidily in a designated area, as instructed by the Site Foreman.

All potential hazards should be identified and where possible removed or appropriate mitigation measures put in place. All work to be carried out in accordance with appropriate safe working practices.

5.2 Safety Procedures & Risk Assessments

The following Safety Procedures and Risk Assessments, not exclusively, shall be examined and adhered to in the planning and execution of the works.

Risk Assessments

RA2 Bridge Construction

RA19 Portable Power Tools

RA5 Dam Diversion Construction RA22 Steel Fixing

RA35 Lifting Operations

RA38 Ladder

RA28 Working at Heights

RA26 Vibration

RA29 Working Adjacent to or in Water

RA10 Handling Chemicals / Hazardous Substances

RA18 Pipe Laying

RA32 Concrete Operations

RA 57 Coronavirus (Covid 19)

RA14 Mobile Plant

RA22 Steel Fixing

RA15 Noise

Scheme:	**Killimor Arterial Drainage Scheme**
Project:	**Accommodation Bridge Replacement @ B58, C1/1/1 – 400 Chainage**
Site Location:	**Stonyisland, Portumna, Co. Galway (53.0848, -8.3107) (Long, Lat)**

RA6 Excavation

RA7 Excavator 360°

RA8 Formwork/Shuttering

Safety Procedures

- SP09 Personal Protective Equipment (PPE)
- SP10 Lifting Equipment - Lifting Gear
- SP11 Electricity
- SP14 Biological Agents
- SP17 Portable Power Tools / Abrasive Wheels
- SP21 Working at Heights
- SP32 Working Adjacent to Water

COVID-19 Compliance Warden TBT

COVID-19 Onsite Warden Checklist.

5.3 Working Adjacent to Water

The OPW "Working in or Adjacent to Water" Risk Assessment and SP32 "Working Adjacent to Water" Safety Procedure must be followed by all operatives. Guard rails shall be erected to secure banks above water.

Life-rings shall be erected at intervals not exceeding 50m along the proposed works areas.

Weather forecasts shall be consulted to ensure no potential large rainfall events are due to occur.

5.4 Working alongside Utilities

An examination of the GIS-Demo ESB layer network indicates that there does not appear to be overhead or underground assets in the vicinity of the works area.

A safe system of work shall be adopted at all times in relation to works taking place in the vicinity of overhead and underground power lines should they be observed to be present at this site location.

ESB Networks Code of Practice Avoiding Danger from Overhead Lines and HSA Code of Practice Avoiding Danger from Underground Services documents relating to these hazards shall be consulted prior to works being carried out. Copies of these documents are available in the Site Office. Any controls and mitigation measures identified in these documents shall be put in place and adhered to by all operatives.

A ground survey (CAT & Genny) by a competent operative will be carried out before any excavation takes place.

5.5 Lifting Operations

Any lifting operations required during this project must be conducted with due regard to the OPW Risk Assessment procedure.

The weights of all objects to be lifted shall be ascertained prior to lifting and all lifting appliances shall be recorded with their assigned Safe Working Load.

Scheme:	**Killimor Arterial Drainage Scheme**
Project:	**Accommodation Bridge Replacement @ B58, C1/1/1 – 400 Chainage**
Site Location:	**Stonyisland, Portumna, Co. Galway (53.0848, -8.3107) (Long, Lat)**

Lifting operations shall be undertaken in the presence of a trained slinger/signaller, with the driver of the lifting appliance having also completed slinger/signaller training.

All operatives who will be working in the vicinity of lifting operations will be informed of the lifting plan prior to any works commencing.

Ground conditions shall be assessed prior to lifting operations to ensure the lifting appliance has a suitable bearing. If there is a doubt over the ground conditions, timber matting shall be used underneath the lifting appliance.

5.6 Personal Protective Equipment

In addition to the standard PPE, operatives shall be provided with the following equipment for this project:

- Safety Goggles
- Ear Defenders
- Gloves
- Life Jacket (if water deep or fast moving – to be assessed by Oliver Gohery)

6 Environmental Protection & Mitigation

All works carried out during this project will be undertaken in accordance with OPW's Environmental Management Protocols & Standard Operating Procedures. (Refer to "OPW Environmental Guidance: Drainage Maintenance & Construction 2019"). Environmental Drainage Maintenance (EDM) Guidelines will be followed at all times. It should be noted these works are being carried out within an SAC.

6.1 Specific Environmental Management Procedures & Controls

Fuelling of machines will be carried out in accordance with OPW Protocols, machines will be kept away from the channel, not less than 50m and fuelled at a safe location with all machines provided with spill kits. The jeep delivering fuel is certified and double bunded. No fuels to be stored on site only in approved vented fuel store with spill trays incorporated.

6.2 Invasive Species

During the site inspection the presence of invasives plant species was not observed. The site works area will be rechecked for invasive species before any works commence. Existing GIS maps will also be analysed and all pertinent information will be included in the project file.

In the event that any invasive species are encountered on site during the project, the OPW Environment Section will be contacted immediately to advise on the procedures to be followed. The OPW SOP for the management of invasive species will be adhered to and all procedures carried out will be recorded in the Safety File.

6.3 Biosecurity

All staff to refer to OPW Environmental Guidance: Drainage Maintenance and construction 2019 re: EP'S 18A and 18B.

Scheme:	**Killimor Arterial Drainage Scheme**
Project:	**Accommodation Bridge Replacement @ B58, C1/1/1 – 400 Chainage**
Site Location:	**Stonyisland, Portumna, Co. Galway (53.0848, -8.3107) (Long, Lat)**

7 Method of Works

7.1 Site Management

Prior to works beginning, a site compound shall be established with designated areas for:

- Welfare Facilities
- Vehicle Parking
- Plant Storage
- Equipment Storage
- Materials Storage

The site compound (See Site Layout) will be set back not less than 50m from the working channel.

7.2 Site Preparation

The works area shall be fenced off to provide safety and security, if required.

Livestock fencing shall be installed given the location of the works within agricultural land, if required.

No works shall begin before the site works area is fully fenced off and secure.

7.3 Works Plan

The Foreman, Site Supervisor and excavator operators shall walk the site in advance of any works proceeding to assess ground conditions, determine suitability of the area for the placement of machinery, location of any services, such as overhead/underground power-lines or if there is a requirement for the use of bog mats. From the most recent site inspection it is not envisaged that bog mats will be required for this site. There was also no evidence of underground services or overhead power lines observed in the vicinity of the works area. Also Refer to maps attached to PRA/M.S.

Typical duration of Pipe culvert bridge works will be in the region of 3 weeks (9 – 12 man weeks). This will depend on site location, existing ground conditions and accessibility. Flow conditions in the channel are such that a diversion channel will not be required for the works.

On salmonid channels instream works only permitted during July-September. Our most recent records do not indicate that this is a salmonid channel.

On all occasions, the excavator operator must be satisfied with the ground conditions upon which he intends to work from.When the excavator operator decides to position the excavator adjacent to the riverbank, he must ensure the riverbank is stable, wide enough and has sufficient bearing capacity to accommodate the machine.

Discussion must take place between the excavator operator and the operatives working in the vicinity of the plant Operatives must not enter the danger zone of the excavator unnecessarily. Excavator operator is to liaise with the appointed slinger/signaller at all times.

7.4 De-watering of Works Area/Excavations

Given the nature of the channel and associated flow conditions, damming and over-pumping will be the method adopted for dewatering the works area to facilitate operations.

Measures for over pumping will generally be water pumped from the excavation area sump which will be released onto grassland at an appropriate distance from the channel to allow natural filtration to occur through the in-situ grasses/soils. Work will only be undertaken in suitably low flow conditions. Pump hoses

shall be placed at a location that does not pose a tripping hazard to personnel and away from the plant operations.

For damming and over-pumping it will be constructed using a locally sourced clay material, compacted in 225mm layers along with sandbags. The dams will be constructed circa 5m upstream and downstream of the existing bridge structure. The dam will be constructed to allow a sufficient freeboard above the water level. Damming will be carried out at a point upstream and downstream of the proposed bridge works to ensure a dry working zone. An AF3 must be completed daily by the site supervisor while the cofferdam is in-situ.

7.5 Demolition of Existing Structure

The existing structure will be inspected during commencement of works, although it is envisaged that large removal will be necessary and full replacement likely.

Any/All Demolition works will be carried out in the dry working zone after placement of cofferdams on the upstream section of channel and installation of diversion channel or over pumping.

The existing structure will be removed using a hydraulic excavator, operated by an experienced and trained operative. Material will be removed from the area and can used as backfill if appropriate. If the material is to be stored on-site prior to removal, it must be stored in an area away from the channel and works area not less than 30 metres.

The area around the existing bridge will be excavated to a suitable width and depth as per the requirements of the new bridge design. The invert level of the existing downstream pipe culvert shall be recorded.

7.6 Construction of New Pipe Culvert Bridge – Methodology

The existing culvert bridge will be refurbished and extended with a new concrete pipe culvert and RC structure. Construction will be undertaken in accordance with the following OPW standard design drawings:

- **2480-DR-003-P2**
- **2480-DR-006-P1**

7.6.1 Removal of old structure & preparation of foundation

Once dewatering structures are in-situ, any damaged sections of the existing bridge structure will be completely removed in advance of replacement. On inspection the existing pipe will remain and the old concrete stub parapets will be removed via the excavator.

All removed unusable material will be stockpiled adjacent to the site compound and taken off site if necessary. A site dumper may be used to transport material.

The channel bed for the proposed extension, will be excavated to an appropriate level to allow formation of an adequate base for the new culvert pipes to sit. The invert level of the new pipe will match that of the existing pipe culvert and excavation depth will allow for a suitable foundation to be formed.

The ground conditions will be examined and a decision will be made by the Site Foreman and Engineer as to material needed for pipe bedding and concrete foundations.

As ground conditions are poor, imported clean broken stone (3”) and granular material (Cl.804) shall be placed and compacted along with lean-mix concrete to create the formation level. The formation level

should be level and checked using a rotating laser level. As per design drawing 2480-DR-003-P2 concrete bedding shall be 225mm below pipe invert. Concrete will be formed against the exiting bank.

The foundation for the end-wall and wing-walls will be formed against the bank or timer edge shutters may be required depending on stability of excavation. Foundation shall be a minimum of 200mm in depth.

2 layers of A393 mesh reinforcement shall be used in the foundation if ground conditions are poor. 40mm cover shall be maintained between the reinforcement and the external finish of the concrete.

7.6.2 Installing and forming new pipe culvert

2 number 0.900m Diameter/1M Length Concrete pipes shall be lifted into place, using the Truck Mounted Hiab.

The pipe will be haunched with concrete to a depth of 150mm on all sides. Refer to **2480-DR-003-P2** for information.

7.6.3 Formation of Wing Walls

The end walls shall be formed around the downstream pipes as per the design drawing.

Peri Formwork shall be used to form the end walls and wing-walls. The end-walls shall be formed to reach upwards and create a foundation for the parapet walls. The depth of wing wall base shall be 300mm as detailed in **2480-DR-003-P2.**

Erect formwork for wing-walls (as per manufacturer/supplier instructions). Wing-walls are to be constructed as per OPW standard design drawings. Ready-mix concrete (as per specification outlined on design drawings) shall be placed in the wing-walls and vibrated using a poker vibrator. Formwork can be removed following adequate curing of the concrete (as per Engineer/Foreman instruction).

Place granular material (3" broken stone & Cl.804) and as dug material, above the lean-mix concrete to the finished level of the bridge crossing.

7.6.4 Formation of Parapet Walls

Once the pipes are in position and wing walls formed, works in installing the pre-cast concrete parapets will commence.

4 number Pre-cast concrete parapets shall be lifted into place and fixed to the outer face of the wing walls, using the Truck Mounted Hiab. Once in position edge shutters are fixed to the outer end of both parapets walls. 2 layers of A393 mesh are then placed and fixed between both parapets walls.

Ready-mix concrete (as per specification outlined on design drawings) shall be placed in the wing-walls and vibrated using a poker vibrator. A brush finish to be applied unless otherwise stated.

Formwork can be removed following adequate curing of the concrete (as per Engineer/Foreman instruction

7.6.5 Reinstatement

A ramp from either side of the newly repaired bridge structure shall be constructed with the excavator and dumper, using suitable material generated from the initial works. CL804 may need to be imported to blind the ramp if existing material is not suitable.

Remove cofferdam or re-instate diversion channel, depending on method used.

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8 Completion of Works

Following the completion of the construction works, the surrounding area shall be reinstated to a condition similar to, or better than the pre-works situation.

Boundaries shall be re-established to the landowner's satisfaction.

A photographic survey of the completed works shall be carried out by the Site Foreman.

Records of any utility diversions and their locations shall be maintained and filed appropriately.

A final inspection of the completed works shall be carried out by the Site Foreman and OPW Engineer to ensure satisfaction with the quality of the works and allow sign-off on OPW Project Risk Assessment / Safety Plan.

Landowner to be asked to fill out Landowner Satisfaction Form while adhering to Covid-19 Protocol.

9 Schedule of Appendices / Documents Attached

Main Documentation:

- Site Location Maps
- Design Risk Assessment
- Project Risk Assessment
- OPW Standard Design Drawings:
- 2480-DR-003-P2
- 2480-DR-006-P1

Statutory Forms:

- TBT Covid-19 Site Safety Induction
- AF3
- AF4
- GA2
- GA3

OPW Forms:

Incident Report Form

Contractors Rules

Project/Site	Stonyisland, Portumna, Co. Galway: C1/1/1 – B58 @ 400 Chainage	
Checked By	*Foreman*	*Foreman*
Approved By	*Engineer(s)*	*Engineer(s)*
Read & Communicated By		*Supervisor*