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Point Bridge and Tom Clarke Bridge Widening Project

Ground Investigation Works and Environmental Surveys

Risk Assessment For Annex IV Species

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ROUGHAN & O'DONOVAN

Maritime Usage Licence Application for Point Bridge and Tom Clarke Bridge Widening Project

Ground Investigation Works and Environmental Surveys

Risk Assessment for Annex IV Species

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1.0 INTRODUCTION

1.1 Project Overview

Roughan & O'Donovan (ROD) was appointed by Dublin City Council to undertake, on its behalf, an Annex IV Species Risk Assessment in support of a licence application to Maritime Area Regulatory Authority (MARA), for Maritime Usage. The licence application is in respect of marine environmental surveys and ground investigation works ("the proposed works") for the purposes of site investigation to inform the design of the Point Bridge and Tom Clarke Bridge Widening Project in Dublin City.

1.2 Legislative Context

1.1.1 Maritime Area Planning legislation

In December 2021, the Government passed the Maritime Area Planning (MAP) Act, 2021 to regulate the maritime area. The MAP Act will achieve this through the National Marine Planning Framework, maritime area consents for the occupation of the maritime area for the purposes of maritime usages for undefined or long periods of time, and licences for marine usages for a relatively short periods of time. The Maritime Area Regulatory Authority (MARA) has been established to oversee the enforcement of this Act. As part of this role, MARA will review applications for consents and licences within the maritime area.

The proposed works are located in a maritime area and are required to inform the design of the Point Bridge and Tom Clarke Bridge Widening Project. These works fall under Schedule 7(3) of the MAP Act, 2021 relating to the 'Maritime Usages which may be undertaken in Maritime Area pursuant to Licence':

> "*3. Marine environmental surveys for the purposes of site investigation or in support of an application under Part XXI of the Act of 2000*".

In accordance with the Act, the proposed works are required to hold a valid licence prior to their commencement.

This report has been prepared to inform the licence application for the proposed works in accordance with the MARA Applicant Technical Guidance Note (2023), for the requirement to complete an Annex IV Risk Assessment.

1.1.2 Annex IV Species Legislation

The Habitats Directive (92/43EEC) is the principal instrument of EU legislation for the protection of natural habitats and wild species. Article 12 of the Directive requires all Member States to "*establish a system of strict protection for the animal species listed in Annex IV (a) in their natural range*". This requirement is transposed into Irish law by Section 51 of the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477/2011, as amended) ("the Habitats Regulations").

Section 51 of the Habitats Regulations protects Annex IV fauna from deliberate capture, killing, disturbance (particularly during sensitive periods), taking or destruction of eggs, damage or destruction of breeding and resting places, and trade or trafficking by making all such activities an offence (save where done in accordance with a licence granted under Section 54 of the Regulations). This applies to all the life stages of the species concerned.

The Annex IV fauna which are relevant in an Irish context include the following:

- 'Microchiroptera – All species' (all bat species present in Ireland);
- Otter (*Lutra lutra*);
- 'Cetacea – All species' (all whales, dolphins and porpoises),
- A number of sea turtles, including the regularly occurring Leatherback Turtle (*Dermochelys coriacea*) and the less frequent Loggerhead Turtle (*Caretta caretta*);
- Natterjack Toad (*Epidalea calamita*);
- Kerry Slug (*Geomalacus maculosus*).

In addition, the relevant Minister is required to monitor the incidental capture and killing of Annex IV fauna and ensure that any incidental capture and killing does not have a significant negative impact on the species concerned.

This Annex IV Species Risk Assessment has been prepared to support the MARA licence application for the proposed works in accordance with the MARA Applicant Technical Guidance Note (2023)[1].

1.3 Methodology

This assessment has been carried out with regard to the relevant legislation and guidance, as well as the documentation submitted with the Application and other information which is publicly available. The documents and sources of information which informed this assessment are as follows:

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive). Official Journal of the European Communities, *L206/7*.
- Council Directive 2008/56/EC of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive). Official Journal of the European Communities, *L164/19*.
- Council Decision 98/249/EC of 7 October 1997 on the conclusion of the Convention for the protection of the marine environment of the north-east Atlantic. Official Journal of the European Communities, *L104/1*.
- DHLGH (2021) *Marine Strategy Framework Directive 2008/56/EC: Article 17 update to Ireland's Marine Strategy Part 2: Monitoring Programme (Article 11).* Department of Housing, Local Government and Heritage.
- EC (2021) *Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC*. European Commission, Brussels.

[1] Obtaining a Licence to Carry Out Specified Maritime Usages in the Maritime Area under the Maritime Area Planning Act 2021 – Applicant Technical Guidance Note (2023)

- NPWS (2007) Circular Letter NPWS 2/07. Guidance on Compliance with Regulation 23 of the Habitats Regulations 1997 – strict protection of certain species/ applications for derogation licences. National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin
- European Communities (Birds and Natural Habitats) Regulations, 2011. *SI No. 477/2011* (as amended).
- MARA (2023) *Obtaining a Licence to Carry Out Specified Maritime Usages in the Maritime Area under the Maritime Area Planning Act 2021: Applicant Technical Guidance Note.* Maritime Area Regulatory Authority, Wexford.
- DAHG (2014) *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters.* Department of Arts, Heritage and the Gaeltacht, Dublin.
- DEHLG (2007) *Code of Practice for the Protection of Marine Mammals during Acoustic Seafloor Surveys in Irish Waters.* Department if the Environment, Heritage and Local Government, Dublin.
- NPWS (2021) *Guidance on the Strict Protection of Certain Animal and Plant Species under the Haitats Directive in Ireland.* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Dublin.
- IWDG (2024) *Sightings Map* <https://iwdg.ie/browsers/sightings-map.php?foundrecords=2434> [accessed December 2024]. Irish Whale and Dolphin Group, Kilrush.
- Marine Institute (2023) *Ireland's Marine Atlas* <https://atlas.marine.ie/> [accessed December 2024]. Marine Institute, Oranmore.
- NBDC (2024) *Biodiversity Maps* <https://maps.biodiversityireland.ie/Map> [accessed December 2024]. National Biodiversity Data Centre, Waterford.

1.4 Statement of Authority

This report has been prepared by Rachel Heaphy and reviewed by Patrick O'Shea. Rachel is an Ecologist with two years' experience in ecological assessment. She holds a BSc (Hons) in Zoology from University College Cork and an MRes degree (with distinction) from the University of Roehampton. Rachel is a Qualifying Member of the Chartered Institute of Ecological and Environmental Management (QualCIEEM).

Patrick is a Principal Ecologist over eleven years' experience in ecological consultancy. He holds a bachelor's degree (with honours) in Botany from Trinity College Dublin, and an MSc in Ecological Management and Conservation Biology from Queen's University Belfast. He is a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM) and holds a licence issued by the National Parks & Wildlife Service for bat roost disturbance during the course of his work.

2.0 DESCRIPTION OF THE PROPOSED WORKS

2.1 Overview

The proposed works involve the gathering, and compilation of ground investigation data to enable the planning, design and construction of the Point Bridge and Tom Clarke Bridge Widening Project. The ground investigation works will include slit trenching and 8 no. boreholes (7 no. in the River Liffey) in the form of rotary core and Geobore S drilling as detailed in Table 2-1. Concrete coring will also be required to confirm the thickness of the existing mass concrete slab at the Tom Clarke Bridge bascule pier. A piezometer will be installed in the land-based borehole in order to monitor groundwater levels.

The environmental surveys involve a gas main survey, an inspection of the pier wall and additional structural inspection works.

2.2 Location

The proposed in-river investigation works will be undertaken within a tidal reach of the River Liffey and in close proximity to the upstream side of the existing Tom Clarke Bridge structure, protective dolphins, and on the quay near Thorncastle Street. The works are also in close proximity to the St Patrick's Rowing club floating pontoon and the high-pressure gas main which passes underneath the Liffey to the west of Tom Clarke bridge. The land-based investigation works are located on the existing North Quay Wall Campshires adjacent to the historic quay wall and the structure supporting the left turn lane from Tom Clarke bridge to North Wall Quay road.

The locations of all ground investigations and environmental surveys are shown on the Proposed Ground Investigation Plan, Drawing No: PTCB-ROD-GEN-AE-SK-CS-301052 in Appendix A.

2.3 Environmental Surveys

2.3.1 Gas Main Survey

Acoustic sub-bottom profiling and marine magnetometer surveys are proposed for the detection of the buried infrastructure and to locate metallic objects on the riverbed. A survey vessel (a small rigid inflatable boat) will be used to transport both sets of apparatus over the survey area. The proposed surveying equipment comprises of a "Innomar Standard Sub-bottom Profiler" and "Geometrics G-882 Marine Magnetometer" or equivalent.

2.3.2 Inspection of North Wall Quay Wall and Tom Clarke Bridge Piers

A Norbit Winghead High Frequency Scanning Multibeam Echo Sounder or equivalent will be mounted on the survey vessel. The multibeam system will provide a detailed topographical survey of North Wall Quay river wall and Tom Clarke Bridge piers below the water line for inspection purposes. There will be no excavations / soil disturbance / structures erected in the maritime area for these survey works.

2.3.3 Structural inspection works for Tom Clarke Bridge

Structural inspection works at Tom Clarke Bridge piers will consist of a dive survey and a survey of the pier concrete above the water. The dive survey will involve a visual condition survey of the visible sections of piles and underwater ultrasonic testing to determine the thickness of the steel pile wall. A magnetometer will be used to locate metallic objects on the riverbed. The above-water survey of the pier concrete will involve chloride testing (depth of ingress into the concrete cover) and defects mapping of the concrete substructures (including the bascule pier).

2.3.4 Inspection of Quay at the end of Thorncastle Street

The proposed structural inspection works will include an underwater point cloud survey undertaken in the vicinity of the existing quay wall at the end of Thorncastle Street in Ringsend, Dublin at the confluence of the Rivers Dodder and Liffey to examine the existing wall condition. There will be no excavations / soil disturbance / structures erected in the maritime area for these survey works.

2.4 Ground Investigations

2.4.1 General Layout

The scope of the works envisaged under this ground investigation is as follows:-

a) High Frequency Scanning Multibeam Echo Sounder survey, Acoustic sub-bottom profiler survey, underwater ultrasonic testing, magnetometer survey and point cloud surveying techniques;

b) Geobore S drilling, sampling and *in situ* testing;

c) Rock coring, proving rock to a specified depth and *in situ* testing;

d) Slit trenching, sampling and *in situ* testing;

e) Concrete Coring;

f) Monitoring of groundwater levels in standpipes and piezometers;

g) Detailed borehole and coring;

h) Sampling to IS EN 22475-1 requirements, predominantly providing Category A samples for laboratory testing of strength and stiffness;

i) Logs as described in IS EN14688-1; IS EN1489-1; and BS5930 and the specification;

j) The ground investigation should be carried out in accordance with British Standard 10175:2001, Investigation of Potentially Contaminated Sites: Code of Practice and the EPA Landfill Manual: Investigations for landfill.

k) Specific slit trenches, probes or sediment grab samples to be carried out for the purpose of contamination assessment, waste classification and offshore marine disposal of excavated spoil plus laboratory testing of soil and ground water samples for engineering properties, behaviour and suitability for reuse as engineering fill;

l) Laboratory testing of rock samples for engineering properties, behaviour and suitability;

m) Laboratory testing of soil and ground water samples for environmental contamination, waste classification and offshore marine disposal of excavated spoil;

n) Preparation of detailed Main Factual Report as per S1.21.8 and cl 16.8 of the Specification, together with the production of Digital Data to AGS Format as per S1.21.10 and cl. 16.5;

o) Preparation of an interpretive Ground Investigation Report in accordance with IS EN1997-2, Section 6 as per S1.21.9;

p) Preparation of a Contamination Assessment Report in accordance with the EPA document '*Environmental Risk Assessment for Unregulated Waste Disposal Sites (2007)*' as per Cl 1.21.9.

q) Preparation of a Waste Classification Assessment and reporting of acceptability of materials for disposal as inert, non-hazardous or hazardous wastes to landfill facilities in accordance with the Commission Decision of 18 December 2014 and EU Commission Regulation No 1357/2014;

r) Assessment of river bottom sediment samples for potential offshore marine disposal in compliance with Marine Institute (2006) "*Guidelines for Assessment of Dredge Material for Disposal in Irish Waters*".

s) Liaison with Dublin City Council and external bodies including landowners, project archaeologist and other appointed third parties working near or over the water during the course of the investigations;

t) Liaison with Dublin Port Company and Waterways Ireland in respect of access, safety measures and employee training required for exploratory works within or in the vicinity of navigable waterways;

u) Liaison and compliance with Health & Safety requirements of PSCS and general contractor; and

v) Provision of temporary traffic management.

2.4.2 Schedule of Investigations

Tables 2-1 to 2-5 below detail the Schedule of Investigations.

Table 2-1 Borehole Schedule

CABLE PERCUSSION BOREHOLES & ROTARY DRILLING / GEOBOR-S POLYMER GEL WIRELINE CORING DRILLHOLES								
Hole ID.	**Type**	**Scheduled Depth (m bGL)**				**Remarks**	**Coordinates (ITM Grid)**	
		CP	**RO**	**PG**	**RC**		**Easting**	**Northing**
Land BHs								
BH105	PG & RC	-	-	30	30 to 40 (10m into rock)	PG may continue beyond its scheduled depth up to the level where rock is found. SPTs as per specification. Piezometer to be installed. Contamination Samples.	718009	734392.6
Marine BHs								
BH101	PG & RC	-	-	20	20 to 30 (10m into rock)	PG may continue beyond its scheduled depth up to the level where rock is found. SPTs as per specification. Environmental samples	718005.5	734274.0
BH102	PG & RC	-	-	20	20 to 30 (10m into rock)	PG may continue beyond its scheduled depth up to the level where rock is found. SPTs as per specification. Environmental samples	718004.6	734298.5
BH103	PG & RC	-	-	20	20 to 30 (10m into rock)	PG may continue beyond its scheduled depth up to the level where rock is found. SPTs as per specification. Environmental samples	718006.2	734343.8
BH104	PG & RC	-	-	20	20 to 30 (10m into rock)	PG may continue beyond its scheduled depth up to the level where rock is found. SPTs as per specification. Environmental samples	718011.3	734368.5
Marine RCs								

CABLE PERCUSSION BOREHOLES & ROTARY DRILLING / GEOBOR-S POLYMER GEL WIRELINE CORING DRILLHOLES								
Hole ID.	**Type**	**Scheduled Depth (m bGL)**				**Remarks**	**Coordinates (ITM Grid)**	
		CP	**RO**	**PG**	**RC**		**Easting**	**Northing**
RC601	RC	-	-	-	15 to 20	Coring to confirm the extent of the existing gravity quay wall base below riverbed.	717930.8	734211.4
RC602	RC	-	-	-	15 to 20	Coring to confirm the extent of the existing gravity quay wall base below riverbed.	717936.5	734209.3
RC603	RC	-	-	-	15 to 20	Coring to confirm the extent of the existing gravity quay wall base below riverbed.	717942.4	734208.4
Notes	Each borehole will take approximately 3 no. days to complete. In-river borehole drilling will be undertaken from a jack up barge either 18mx12m or 18mx18m, with 27m legs.							

Table 2-2 Window Sampling & Grab Sample Schedule for Contamination Assessment

Contamination Assessment Window Sampling / Grab Sample Locations					
Hole ID.	**Type**	**Schedule Depth (m bGL)**	**Remarks**	**Coordinates (ITM Grid)**	
				Easting	**Northing**
WS01	WS	6	*Location and sampling to be identified by Environmental Scientist as part of contamination assessment / waste classification*	TBC	TBC
WS02	WS	6	*Location and sampling to be identified by Environmental Scientist as part of contamination assessment / waste classification*	TBC	TBC
WS03	WS	6	*Location and sampling to be identified by Environmental Scientist as part of contamination assessment / waste classification*	TBC	TBC
WS04	WS	6	*Location and sampling to be identified by Environmental Scientist as part of contamination assessment / waste classification*	TBC	TBC
GS 101	GS	0.5	*Location and sampling to be identified by Environmental Scientist as part of contamination assessment / waste classification*	TBC	TBC
GS 102	GS	0.5	*Location and sampling to be identified by Environmental Scientist as part of contamination assessment / waste classification*	TBC	TBC
GS 103	GS	0.5	*Location and sampling to be identified by Environmental Scientist as part of contamination assessment / waste classification*	TBC	TBC
GS 104	GS	0.5	*Location and sampling to be identified by Environmental Scientist as part of contamination assessment / waste classification*	TBC	TBC

Table 2-3 Slit Trench Schedule

Slit Trench Locations							
Hole ID.	**Type**	**Schedule Depth (m bGL)**	**Remarks**	**Coordinates (ITM Grid)**			
				Point 1	**Point 2**	**Point 3**	**Point 4**
ST101	ST	2.5	Pedestrian protection required. **Shape and extent as per Ground Investigation Drawing.** An archaeologist to be present during excavation.	Easting: 718022.9 Northing: 734388.2	Easting: 718003.1 Northing:734389.3	Easting: 718004.0 Northing: 734399.7	Easting: 718014.4 Northing: 734397.3
Hole ID.	**Type**	**Schedule Depth (m bGL)**	**Remarks**	**Point 1**		**Point 2**	
ST102	ST	2.5	Traffic Management System required. Pedestrian protection required. Minimum width of 1.5m. An archaeologist to be present during excavation.	Easting: 718027.9	Northing: 734389.0	Easting: 718025.2	Northing: 734387.8

Table 2-4 Concrete Coring Locations

Concrete Coring Locations					
Hole ID.	**Type**	**Schedule Thickness (m)**	**Remarks**	**Coordinates (ITM Grid)**	
				Easting	**Northing**
CC101	CC	Full concrete slab thickness	*Coring to confirm the thickness of the existing mass concrete slab placed during the temporary works cofferdam construction used to construct the Tom Clarke Bascule Pier.*	718011.7	734297.6

Table 2-5 Geophysical Surveys

Quay Wall and Services Inspections			
Method	**Remarks**	**Coordinates (ITM Grid)**	
		Easting	**Northing**
High Frequency Scanning Multibeam Echo Sounder (MBES)	*To provide detailed topographical survey of the north quay wall at Tom Clarke Bridge and the existing south quay wall near Thorncastle Street.*	-	-
Marine Magnetometer	*To detect buried infrastructure. Locate surface metallic objects on the riverbed.*	-	-
Underwater Ultrasonic Testing (UT)	*To determine the thickness of the steel pile wall.*	-	-
Point Cloud Survey	*Provide precise measurements and 3D spatial imagery of the existing quay wall and associated cladding, including positions and any protrusions or irregularities.*	-	-
Acoustic Sub-Bottom Profiling (SBP)	*Determine buried objects (cables, pipes or infrastructure) and existing quay wall extents under riverbed.*	-	-

Notes

1. CP = Cable Percussion, RO = Rotary Open Hole, RC = Rotary Core, PG = Polymer Gel Geobor-S Rotary Coring, ST = Slit Trench; WS = Window Sampling, GS Grab Sediment Sample; CC = Concrete Coring.
2. Coordinates to Irish Transverse Mercator Grid (ITM) and reduced levels to Malin Head Datum required for all BH i.e. CP and RC (incl. RO & PG), TP, ST, PC.
3. Undisturbed sampling is required in cohesive soils.
4. A minimum total core recovery of 95% and a minimum rock quality designation of 40% is required when coring in rock. Where voids are encountered a standard penetration test shall be undertaken.

2.4.3 Timing and Duration

The duration of all the works will be less than three months, the timing of the proposed works is expected to commence in February 2025, provided that all relevant licences are obtained. A breakdown of the duration of each of the proposed works is provided in Table 2-6 below.

Table 2-6 Timing and Duration of Environmental Surveys and Ground Investigation Works

Survey Type	Commencement	Duration
Gas Main Survey	Feb 2025	2 days
Inspection of North Wall Quay Wall and Tom Clarke Bridge	Feb 2025	2 days
Structural Inspection works	Feb 2025	One week
Ground Investigation works	Feb 2025	3 months
Note [1] Gas Main Survey and Inspection of North Wall Quay Wall and Tom Clarke Bridge will be carried out at the same time.		

2.4.4 Working Hours

The working hours will be limited to the following:

- Monday to Friday between 08.00 hrs and 18.00 hrs.
- Saturday between 09:00 hrs and 16:30 hrs.

Work on site outside of these hours will only be permitted on approval from the Investigation Supervisor. Movement of marine barges to / from the site and to borehole locations must follow all relevant restrictions on marine traffic imposed by the Dublin Port Authority.

Timing of the Slit Trench works at North Wall Quay may be limited by the local authority as part of Road Opening Licencing / Permit process. Slit trench works extending out into the trafficked lane on North Wall Quay / Tom Clarke Bridge will be restricted to Monday to Friday between 21:00 hrs and 00:00hrs (midnight) and 00:00 hrs (midnight) and 06:00 hrs. Saturday between 00:00 hrs (midnight) and 06:00 hrs.

3.0 ANNEX IV RISK ASSESSMENT

3.1 Zone of Influence

The "Zone of Influence" of a project is the geographic extent over which significant ecological effects are likely to occur. Best practice guidance recognises that the Zone of Influence on a case-by-case basis using the Source-Pathway-Receptor Model. A project may only lead to significant effects on the integrity of the European site where all three elements of Source-Pathway-Receptor are linked. In the absence of one element of this model, likely significant effects can be screened out with confidence. The assessment should make reference to the following key variables:

- The nature, size and location of the project;
- The nature of the impacts which may arise from the project;
- The sensitivities of the ecological receptors; and,
- The potential for in-combination effects.

In the marine environment, Zones of Influence can be extensive e.g. pollution and materials can easily be transported elsewhere, currents and waves can be altered causing effects well beyond the site and effects on mobile species may be manifest elsewhere (CIEEM, 2018).

In order to assess the potential impacts on Annex IV species and considering the nature and scale of the proposed works, the zone of influence is defined as:

- The immediate area around the proposed works;
- The Liffey Estuary Lower Transitional Waterbody
- Dublin Bay Coastal Waterbody.

The Liffey Estuary Lower Transitional Waterbody and the Dublin Bay Coastal Waterbody are the extents to which hydrological impacts could potentially occur upstream and downstream of the proposed works in the River Liffey and Dublin Bay[2] .

A search for records of Annex IV species within the Zone of Influence was undertaken as part of the assessment.

The Zone of Influence is presented in Appendix B.

[2] As defined in Directive 2000/60/EC of 23 October 2000 establishing a framework for Community action in the field of water policy (the "Water Framework Directive"), transitional waters are as bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their proximity to coastal waters but which are substantially influenced by freshwater flows.

3.2 Annex IV Fauna

Based on a review of the Irish Whale and Dolphin Group's *Sightings Map* (IWDG, 2024), National Biodiversity Data Centre's *Biodiversity Maps* (NBDC, 2024) and *Ireland's Marine Atlas* (Marine Institute, 2024), Table 3.1 presents the Annex IV fauna that were recorded within the zone of influence of the proposed works.

Table 3.1 Annex IV fauna recorded within the zone of influence of the proposed works.

Common Name	Scientific Name
Cetaceans	
Bottlenose Dolphin	*Tursiops truncatus*
Common Dolphin	*Delphinus delphis*
Fin Whale	*Balaenoptera physalus*
Harbour Porpoise	*Phocoena phocoena*
Pygmy Sperm Whale	*Kogia breviceps*
Bats	
Common Pipistrelle	*Pipistrellus pipistrellus*
Soprano Pipistrelle	*Pipistrellus pygmaeus*
Leisler's Bat	*Nyctalus leisleri*
Daubenton's Bat	*Myotis daubentonii*
Nathusius's Pipistrelle	*Pipistrellus nathusii*
Semi-aquatic mammals	
Otter	*Lutra lutra*

Other Annex IV fauna, such as those listed above in Section 1.2 were deemed to either not occur within the zone of influence or occur only very infrequently or in exceptional cases (NBDC, 2024). The assessment in the following subsections focusses on the species listed above in this section.

3.3 Assessment of Impacts

This section provides an assessment of the impacts arising from the proposed works on the Annex IV fauna listed in Section 2.2 above, as described in the documents listed in Section 1.2.

3.3.1 Bat Species

Common Pipistrelle (*Pipistrellus pipistrellus*), Soprano Pipistrelle (*P. pygmaeus*), Leisler's Bat (*Nyctalus leisleri*), Daubenton's Bat (*Myotis daubentonii)* and Nathusius's Pipistrelle (*Pipistrellus nathusii)*, have all been recorded in Dublin Port in the vicinity of the proposed works (NBDC, 2024). A preliminary bat roost suitability assessment undertaken by ROD ecologists in 2023 did not identify and structures or trees in the vicinity of the proposed works with the potential to support roosting bats. Bat activity surveys, conducted by ROD between June – September 2022 recorded Common Pipistrelle, Soprano Pipistrelle and Leisler's Bat in the area of the proposed works.

Given the nature, timing and location of the proposed works, as well as existing ambient visual and noise disturbance levels in the area, there will be no significant impacts on bat species as a result of the proposed works. Therefore, as a result of this conclusion, there will be no offence to bat species under Section 51 of the Habitats Regulations as a result of the proposed works.

3.3.2 Otter

Otter has been recorded in the vicinity of the proposed works (Trituris, 2022) and there are multiple records of otter using the Liffey Estuary Lower for breeding and foraging (NBDC, 2024). Evidence of otter was recorded as close as the St Patricks Rowing Club pontoon, which is within the proposed works boundary (Trituris, 2022). An otter holt has also been recorded approx. 200 m southwest of the proposed works near Camden Lock (Triturus, 2022). Otter territories are typically between 2 – 32 km in length but can be up to 80 km (Kruuk, 1995). Otter are likely to be in the River Liffey during the proposed works. The proposed works provide the potential for displacement, noise and visual disturbance impacts to Otter as well as potential water quality impacts from sediment mobilisation and pollutant discharge.

The location of the proposed works is within Dublin Port which is a very busy and active port with constant movement of boat traffic in and out of the area. Any otters in the area are already habituated to high levels of disturbance due to the nature and location of the port in the centre of a capital city. The tidal nature of the Liffey means there is already elevated levels of suspended solids. Any potential mobilisation of sediment or potential spillage of pollutant as a result of the proposed works would be immeasurable. The location of the known otter holt is located at least 200 m from the proposed works. There is a recommended minimum distance of 150 m between any works and sensitive otter holts to avoid impacts to otter (NRA, 2008).

Given the nature, timing and location of the proposed works, as well as the existing ambient visual and noise disturbance levels and sediment mobilisation already occurring in the area, there will be no significant impacts to otter as a result of the proposed works. Therefore, as a result of this conclusion, there will be no offence to otter under Section 51 of the Habitats Regulations as a result of the proposed works.

3.3.3 Cetaceans

Five cetacean species, namely Harbour Porpoise (*Phocoena phocoena*), Bottlenose Dolphin (*Tursiops truncates*), Common Dolphin (*Delphinus delphis*), Fin Whale (*Balaenoptera physalus*) and Pygmy Sperm Whale (*Kogia breviceps*) have been recorded within the zone of influence (NBDC, 2024; IWDG, 2023) and are likely to occur near the location of the proposed works, however records of these species are infrequent and the location of the proposed works is not considered to be important or regularly used cetacean habitat. All are protected under Annex IV of the Habitats Directive and Harbour Porpoise and Bottlenose Dolphin are also protected under Annex II of the Habitats Directive.

Cetaceans are particularly sensitive to underwater noise and hydroacoustic impacts given their reliance on sound as their primary sense. All cetaceans that have been recorded within the zone of influence are either low-frequency, mid-frequency or high-frequency cetaceans, with hearing ranges of 0.007 kHz – 22 kHz, 0.15 kHz – 160 kHz and 0.2 kHz – 180 kHz, respectively. The impacts which noise can have on cetaceans include, in order of increasing severity: behavioural disturbance/response, avoidance/masking, auditory tissue damage, which can be temporary, i.e., Temporary Threshold Shift (TTS) or permanent, i.e., Permanent Threshold Shift (PTS), traumatic injury and death. Each cetacean group has a different limit of TTS and PTS (Table 3.2).

Table 3.2 Marine mammal noise exposure criteria given by Southall et al. 2007

Species	Hearing group and estimated auditory bandwidth (kHz)	Exposure Criteria (SPL – sound pressure level[3], SEL – sound exposure level[4])		
		PTS – onset *	TTS-onset	Behavioural response
Certain toothed whales, porpoises Pygmy sperm whale Harbour porpoise	High-frequency cetaceans 0.2 - 180 kHz	230 dB SPL 198 dB SEL	224 dB SPL 183 dB SEL	90-170 dB RL [5]
Most toothed whales, dolphins Sperm whale Killer whale Long-finned pilot whale Beaked whale species Dolphin species	Mid-frequency cetaceans 0.15 - 160 kHz	230 dB SPL 198 dB SEL	224 dB SPL 183 dB SEL	90-200 dB RL
Baleen whales Humpback whale Blue whale Fin whale Sei whale Minke whale	Low-frequency cetaceans 0.007 - 22 kHz	230 dB SPL 198 dB SEL	224 dB SPL 183 dB SEL	120-160 dB RL

The environmental surveys will involve the use of an acoustic Sub-bottom profiler (SBP), a vertical magnetic gradiometer and a High Frequency Scanning Multibeam Echo Sounder (MBES). The GI works will involve rotary core and Geobore S drilling and concrete coring into an existing cofferdam concrete plug. Underwater noise emissions will come from the environmental surveys (e.g., acoustics from the Sub-bottom profiler, and the Multibeam Echo Sounder) and the GI works (e.g., jack-up barge and borehole drilling). See Table 3.3 for an example of the underwater noise levels which are emitted by the proposed works equipment at 1m from the source.

[3] Sound Pressure Level (SPL) – A logarithmic measure in decibels (dB) of the average pressure level in water/air, with respect to a standard reference pressure (i.e., re. 1µPa in water or 20µPa in air). Commonly standardised to a distance of 1 metre from the source (i.e., @ 1m), SPL represents the amplitude of a sound's waveform and it may be measured in a number of ways including peak or peak-to-peak (for short duration sounds) and root mean square (i.e., rms) estimates (for continuous sounds).
[4] Sound Exposure Level (SEL) – A measure of sound energy over a given duration, i.e., time integral of instantaneous sound pressure squared, normalised to a 1 second period (dB re. µPa2–s or µPa2.s).
[5] Sound Received Level (RL) – the pressure level measured at the receiver, e.g., mammal.

Table 3.3 Underwater noise levels emitted by the proposed works equipment.

Sound Type	SPL_{peak} (dB re 1 µPa at 1 m)	Frequency (kHZ)	Within cetacean frequency hearing ranges
High Frequency Scanning Multibeam Echo Sounder (MBES) *	210-229	200-450	No
Marine Magnetometer	No sound emitted	No sound emitted	N/A
Underwater Ultrasonic Testing (UT)	Unknown	500 - 15000	No
Point Cloud Survey	No sound emitted	No sound emitted	N/A
Acoustic Sub-Bottom Profiling (SBP)	208-225	0.2-20[6]	Yes
Rotary Drill	191	0.02-50[7]	Yes

**Underwater noise is referenced to a pressure of 1 micro pascal (µPa)*

Based on the sound pressures and frequencies that will be emitted during the proposed works, as listed in Table 3.3, and the hearing ranges of the cetaceans as listed in Table 3.2, there will be no impact to cetaceans as a result of the Multibeam Echo Sounder or Ultrasonic Testing as the frequency output is not within the hearing range of any cetacean, nor will there be any impact to cetaceans as a result of the Marine Magnetometer and the Point Cloud Survey as no sound is emitted during these surveys. There will be no impacts to cetaceans as a result of these elements of the environmental surveys.

The Sub-bottom Profiler emits sound at frequencies between 0.2 – 20 kHz, which is within the frequency range of all cetacean species listed in Table 3.2. This exceeds the TTS and PTS thresholds of all cetaceans. Therefore, all cetaceans are at risk of temporary or permanent loss of hearing due to auditory tissue impairment if they are in the vicinity of the proposed works.

The frequency that will be emitted during the borehole drilling is within the hearing range of all cetaceans. The lowest threshold for TTS in cetaceans is 183 dB SEL (Southall et al. 2007). The highest estimate for noise levels produced by rotary drilling underwater has been assumed for the proposed works (191 dB re 1 µPa). Therefore, the proposed works may produce noise levels in excess the injury thresholds for these species.

The risk of injury or mortality as a result of a vessel collision is considered extremely low as the vessels will be moving at low speeds and cetaceans infrequently occur within Dublin Harbour.

Given to the nature and location of the proposed works, there is a risk of impacts to the cetacean species which occur in the zone of influence of the works, namely Harbour Porpoise, Bottlenose Dolphin, Common Dolphin, Fin Whale and Pygmy Sperm Whale. In the absence of mitigation, significant impacts to cetaceans afforded strict protection under Article 12 of the Habitats Directive as a result of the proposed works would constitute offences under Section 51 of the Habitats Regulations. Therefore, mitigation measures are proposed in Section 4 of this report.

[6] Depending on device type, manufacturer and power settings
[7] Erbe & McPherson, 2017

4.0 MITIGATION MEASURES

This report has assessed the potential for the proposed works to give rise to impacts on species afforded strict protection under Article 12 of the Habitats Directive which would constitute offences under Section 51 of the Habitats Regulations. In Section 3.3.1 and Section 3.3.2 it was concluded that there will be no deliberate capture, killing, disturbance (particularly during sensitive periods), damage or destruction of breeding and resting places to bat species or otter.

In Section 3.3.3, it was determined that, in the absence of mitigation, significant impacts to cetaceans are possible if they are close enough to the proposed works to receive sound levels above their threshold injury levels as a result of the Sub-bottom Profiler and Rotary Drill. Therefore, mitigation measures are proposed in order to endure there will be no significant impacts to cetaceans afforded strict protection under Article 12 of the Habitats Directive as a result of the proposed works which would constitute offences under Section 51 of the Habitats Regulations.

Adhering to *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters* (DAHG, 2014), the following mitigation measures are proposed to minimise potential impacts to cetaceans due to the environmental surveys and GI works:

1. A qualified and experienced marine mammal observer (MMO) shall be appointed to monitor for marine mammals and to log all relevant events using standardised data forms, which can be found appended to DAHG, 2014.

2. Unless information specific to the location and/or plan/project is otherwise available to inform the mitigation process (e.g., specific sound propagation and/or attenuation data) and a distance modification has been agreed with the Regulatory Authority, acoustic surveying using the above equipment shall not commence if marine mammals are detected within a 500m radial distance of the sound source intended for use, i.e., within the Monitored Zone.

3. Sound-producing activities shall only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO, has been achieved. Where effective visual monitoring, as determined by the MMO, is not possible the sound-producing activities shall be postponed until effective visual monitoring is possible.

4. An agreed and clear on-site communication signal must be used between the MMO and the proposed works Superintendent as to whether the relevant activity may or may not proceed, or resume following a break (see below). It shall only proceed on positive confirmation with the MMO.

5. In waters up to 200m deep, the MMO shall conduct pre-start-up constant effort monitoring at least 30 minutes before the sound-producing activity is due to commence. Sound-producing activity shall not commence until at least 30 minutes have elapsed with no marine mammals detected within the Monitored Zone by the MMO.

6. This prescribed Pre-Start Monitoring shall subsequently be followed by a Ramp-Up Procedure which should include continued monitoring by the MMO.

7. In commencing an acoustic survey operation using the above equipment, the following Ramp-up Procedure (i.e., “soft-start”) must be used, including during any testing of acoustic sources, where the output peak sound pressure level from any source exceeds 170 dB re: 1µPa @1m:

   (a) Where it is possible according to the operational parameters of the equipment concerned, the device’s acoustic energy output shall commence from a lower energy start-up (i.e., a peak sound pressure level not exceeding 170 dB re: 1µPa @1m) and thereafter be allowed to gradually build up to the necessary maximum output over a period of 20 minutes.

   (b) This controlled build-up of acoustic energy output shall occur in consistent stages to provide a steady and gradual increase over the ramp-up period.

   (c) Where the acoustic output measures outlined in steps (a) and (b) are not possible according to the operational parameters of any such equipment, the device shall be switched “on” and “off” in a consistent sequential manner over a period of 20 minutes prior to commencement of the full necessary output.

8. In all cases where a Ramp-Up Procedure is employed the delay between the end of ramp-up and the necessary full output must be minimised to prevent unnecessary high-level sound introduction into the environment.

9. Once the Ramp-Up Procedure commences, there is no requirement to halt or discontinue the procedure at night-time, nor if weather or visibility conditions deteriorate nor if marine mammals occur within a 500m radial distance of the sound source, i.e., within the Monitored Zone.

10. If there is a break in sound output for a period greater than 30 minutes (e.g., due to equipment failure, shut-down, survey line or station change) then all Pre-Start Monitoring and a subsequent Ramp-up Procedure (where appropriate following Pre-Start Monitoring) must be undertaken.

11. For higher output survey operations which have the potential to produce injurious levels of underwater sound (see sections 2.4, 3.2) as informed by the associated risk assessment, there is likely to be a regulatory requirement to adopt a shorter 5 – 10-minute break limit after which period all Pre-Start Monitoring and a subsequent Ramp-up Procedure (where appropriate following Pre-Start Monitoring) shall recommence as for start-up.

4.1 Recommended Conditions

It is recommended that the mitigation measures presented in Section 4 above are conditions to be attached to any license granted

4.2 Residual Impacts

Following the full and complete implementation of the mitigation measures presented in Section 4 above, there will be no negative residual impacts from the proposed works on cetaceans in the area. Provided these mitigation measures are implemented in full, it is unlikely that any animals will be injured as a result of the proposed works.

5.0 CONCLUSION

This report has assessed the potential for the proposed works to give rise to impacts on species afforded strict protection under Article 12 of the Habitats Directive which would constitute offences under Section 51 of the Habitats Regulations. The above sections have provided the assessment and has concluded that following the full and successful implementation of the mitigation measures, there will be no deliberate capture, killing, disturbance (particularly during sensitive periods), damage or destruction of breeding and resting places on bat species, otter or cetaceans species. Therefore, no offence under Section 51 of the Habitats Regulations will be committed as a result of the proposed development, and as a result, no derogation licence will be required.

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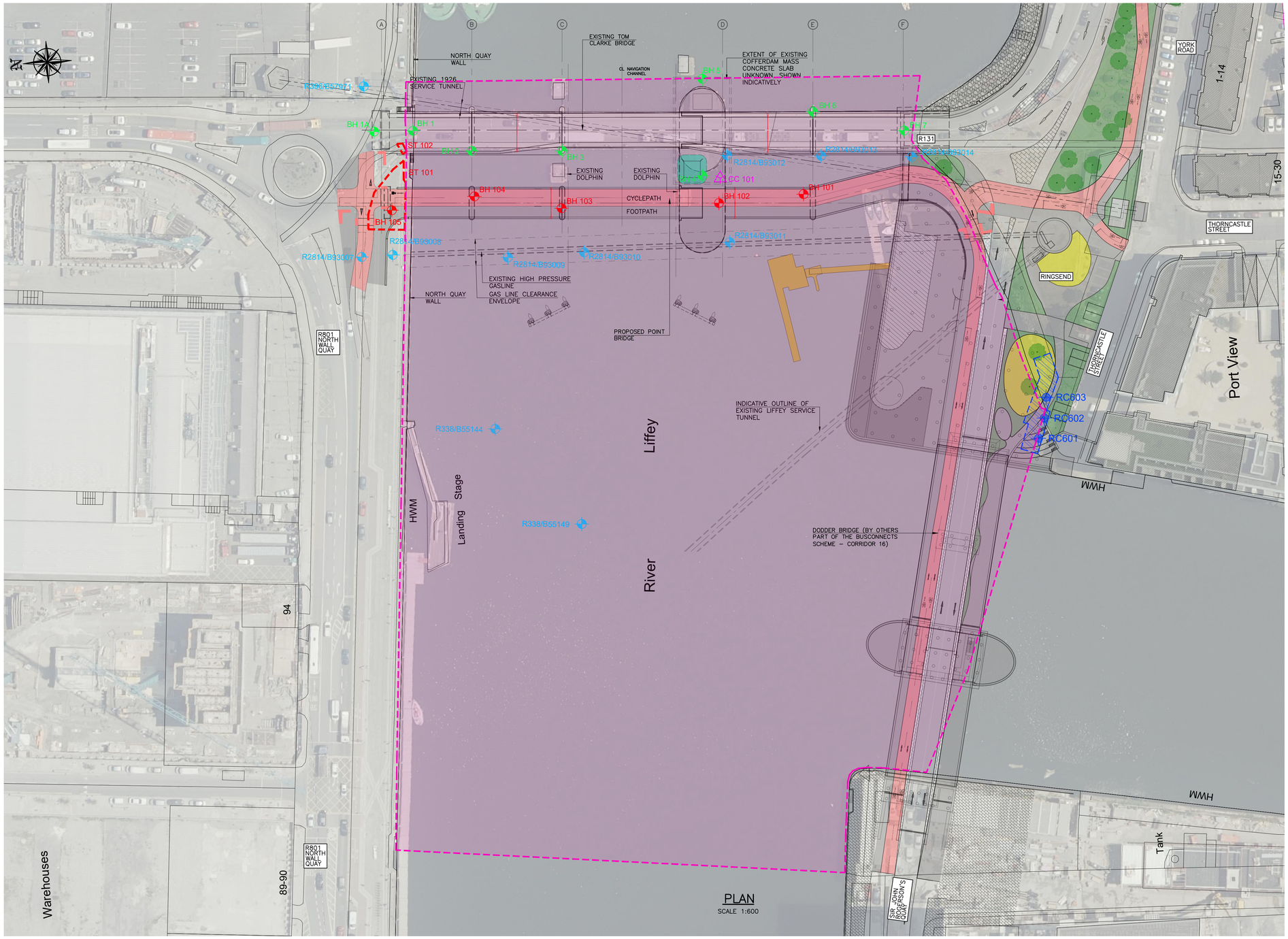
APPENDIX A
GROUND INVESTIGATION LOCATIONS



PLAN
SCALE 1:600

LEGEND :

DENOTES AREA OF RELEVANT SURVEYS:
- POINT CLOUD SURVEY

DENOTES AREA OF RELEVANT SURVEYS:
- ACOUSTIC SUB-BOTTOM PROFILING SURVEY
- MARINE MAGNETOMETER SURVEY

RC6XX — PROPOSED GI BOREHOLE LOCATIONS FOR DODDER BRIDGE PILE SUPPORTED SLAB STRUCTURE

BH 1XX — PROPOSED GI BOREHOLE LOCATIONS FOR POINT FOOTBRIDGE STRUCTURE

CC 1XX — PROPOSED CONCRETE CORING LOCATION FOR EXISTING COFFERDAM MASS CONCRETE SLAB

ST 1XX — PROPOSED SLIT TRENCH –INDICATIVE LOCATION FOR POINT FOOTBRIDGE STRUCTURE

BH XX — EXISTING BOREHOLE LOCATIONS (TOM CLARKE BRIDGE)

R2814/BXX — EXISTING BOREHOLE LOCATIONS (GSI)

Note:
Location of window samples, sediment grab samples and any other sampling required to inform the Contamination Assessment Report are to be determined by the Contractor's Environmental Scientist

Client: Comhairle Cathrach Bhaile Átha Cliath Dublin City Council; NTA Údarás Náisiúnta Iompair National Transport Authority; Project Ireland 2040 Building Ireland's Future

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DQ	PC	PC	CS	S2 - Information/Planning

Project Stage: PRELIMINARY DESIGN

Project Title: POINT BRIDGE AND TOM CLARKE BRIDGE WIDENING PROJECT

Drawing Title: PROPOSED GROUND INVESTIGATION

Drawing Number: Project | Originator | Volume | Location | Type | Role | Number — PTCB - ROD - GEN - AE - SK - CS - 301052

Scale (A1): AS SHOWN | Date: Dec.2024 | Job No: 21.124 | Rev: P01

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APPENDIX B
ZONE OF INFLUENCE

Client:
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NTA
Údarás Náisiúnta Iompair
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V1.0	ISSUE FOR INFORMATION	March '23	KM	PO'S	FO'K
V2.0	ISSUE FOR INFORMATION	Oct '23	MMC	JS	PO'S
V3.0	ISSUE FOR INFORMATION	DEC. 2024	YB	SS	PO'S

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Project Stage: PRELIMINARY DESIGN

Project Title: POINT BRIDGE AND TOM CLARKE BRIDGE WIDENING PROJECT

Drawing Title: ZONE OF INFLUENCE

Drawing Number	Project	Originator	Volume	Location	Type	Role	Number
	PTCB	ROD	ENV	SW_AE	DR	EN	FIG. 1.1

Scale (A1): Refer to Scalebar | Date: DECEMBER 2024 | Job No: 21.124 | Rev: V3.0

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