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Attachment 3.1 - Proposed Maritime Usage
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1.1 Description of works

The Proposed Project comprises a geotechnical site investigation of the subsurface within the River Liffey between the Rosie Hackett Bridge and Butt Bridge. The geotechnical site investigation will consist of drilling three (3 No.) boreholes and associated sampling and testing. Full recovery of the boreholes is proposed. It is proposed that boreholes will be drilled to depths of between approximately 25 m and 30 m below the riverbed. The indicative locations of the boreholes are presented in Figure 3.1-1.

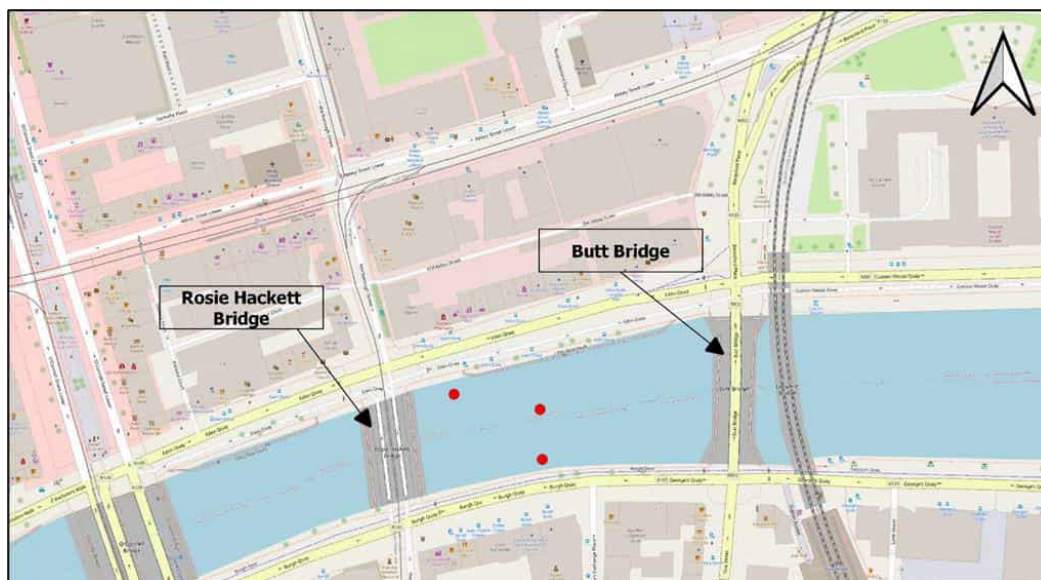


Figure 3.1-1 Geotechnical site investigation location with indicative borehole locations

The investigation will be carried out from a floating jack-up barge positioned within the river channel. All equipment that will be used for the drilling work will be placed on a barge. All drilling works will be through the river into underlying sediment and rock.

River access will be via the section of Burgh Quay located between the Rosie Hackett Bridge and Butt Bridge. Burgh Quay is located on the south bank of the River Liffey and adjacent to regional roads R105/R138.

1.1.1 Mobilisation of Jack-up Barge and Drilling Equipment

The investigation will be carried out from a floating jack-up barge 'Causeway Giant 1' (see Figure 3.1-2 and Figure 3.1.3) which will be positioned within the river channel using a crane located on Burgh Quay. All equipment that will be used for the drilling work will be placed on the barge.



Figure 3.1-2 Causeway Giant 1



JACK-UP BARGE: CAUSEWAY GIANT 1

Delivered to site:	Road transportable; 8 loads in total (6 standard trailers, 2 trombone trailers)
Working Area:	18m x 12m available deck area
Applications:	Inshore and nearshore waters (typically up to 20-22m water depth depending on seabed material; can also be used in floating mode in up to 25m water depth). Working platform for a range of geotechnical investigation techniques, including sonic and rotary wireline drilling. Can also be used for both CPT operations and vibrocore sampling.
Add. Equipment:	Integrated moonpool, office/workshop unit, fixed ladder assembly

TECHNICAL DATA

Barge Size:	18m x 12m x 1.5m	Pontoon Weight (each):	13 ton
Spud Legs:	28m long; 762 mm o/d (25 mm wall)	Jacking Unit weight (each):	5 ton
Deck Load:	15 t/m ²	Leg/extension (each):	10 ton / 6 ton
Powerpack Engine:	Deutz F6L912 Aircooled	No. of Moonpools:	2 x 300mm
Hydraulic Oil Capacity:	280 litres	Deck Lifting Capacity:	80 ton

Figure 3.1-3 Specification data for the Causeway Giant 1 (Causeway Geotech Ltd).

1.1.2 Construction (drilling, in-situ analysis and core recovery)

The jack-up barge will deploy four legs to the riverbed to provide stability throughout the works. These legs are installed vertically and do not involve excavation or anchoring. The drilling rig and associated plant are powered by diesel engines. Where refuelling is required to take place on the barge, it will be carried out using jerry cans and plant nappies.

Drilling will be undertaken using a dual-purpose roto-sonic drilling rig (Eijkelpamp Fraste CRS XL140/170 Duo) mounted on the jack-up barge. All drilling works will be through the river into underlying sediment and rock and continuous recovery of the boreholes is proposed. It is proposed that boreholes will be drilled to depths of between approximately 25 m and 30 m below the riverbed. All boreholes will be appropriately decommissioned following completion of drilling and recovery of core.

Underwater noise emissions from the proposed site investigation works are expected to fall within the range typically associated with rotary and sonic drilling methods. Published literature indicates that sonic drilling operations generally produce underwater sound pressure levels (SPLs) in the region of 160-180 dB re 1 μ Pa @ 1 m, with peak levels rarely exceeding 185 dB re 1 μ Pa @ 1 m (e.g. Robinson et al., 2011; Nedwell et al., 2003). The associated sound exposure levels (SELs) are typically lower, in the region of 145–165 dB re 1



$\mu\text{Pa}^2.s$ @ 1 m, reflecting continuous but relatively moderate acoustic output of the equipment.

1.1.3 Demobilisation

Demobilisation of the barge will occur via Burgh Quay.

1.2 Programme of Works

The programme of works will be dependent on the conditions applied to any road closures and any restrictions in working hours which may be imposed. Additionally, it will be dependent on weather conditions and any observations of marine mammals made during Marine Mammal Observer (MMO) monitoring. The MMO remit may also include recording observations of otter where sightlines allow.

The works are predicted to be completed in between 10 to 21 days subject to weather conditions, site conditions, and any on-site coordination with relevant third parties (e.g. Dublin City Council, Inland Fisheries Ireland, National Parks and Wildlife Service) if required. A conservative indicative programme is set out in Table 3.1-1.

Table 3.1-1 Indicative programme

Activity	Indicative duration
Mobilisation from Burgh Quay	Nighttime closures of the quay over up to 7 nights are anticipated.
Construction (drilling, in-situ analysis and core recovery)	It is proposed that works will proceed on a 24/7 basis for up to 7 days.
Demobilisation from Burgh Quay	Nighttime closures of the quay over up to 7 nights are anticipated.

1.3 Operational procedures and monitoring during works phases

Please note that information regarding proposed durations of works and any seasonal, vessel or other schedule constraints is addressed in Section 3.3 of the MUL1 Application Form.



If a temporary closure of the section of the R138 road adjacent to Burgh Quay is required to mobilise /demobilise the jack-up barge, a road closure permit will be obtained from Dublin City Council (DCC) and its conditions adhered to.

The Contractor will develop a works-specific Risk Assessment Method Statement (RAMS) for the proposed site investigation; all works will be carried out in accordance with the project-specific RAMS.

The Contractor will develop the works-specific RAMS using the example outline documentation provided below. The appointed Contractor will be responsible for developing and updating these documents as required and submitting to Transport Infrastructure Ireland (TII) for review and approval prior to works.

Operational controls set out in the wider MUL Application submission, including the combined Appropriate Assessment Screening Report and Natura Impact Statement (see Attachment 4.3), Annex IV Species Risk Assessment (see Attachment 4.4), Water Framework Directive Assessment (see Attachment 4.5) and Marine Strategy Framework Directive Assessment (Attachment 4.6), will be incorporated into the Contractor's RAMS, including the following:

- Provision of Marine Mammal Observer (MMO) monitoring during start-up and soft-start phases of drilling operations and during active drilling operations, remit to include observations for otters where sightlines allow.
- Use of soft-start procedures for drilling operations in accordance with NPWS (2014) Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters.
- Site personnel shall be briefed on the potential presence of protected species, including otter (*Lutra lutra*), seals and cetaceans within the River Liffey corridor. If a protected species is observed in close proximity to active works and considered at risk of disturbance or harm, works in the immediate area shall be temporarily paused and the situation assessed prior to recommencement.
- Use of directional lighting to minimise light spill and schedule works outside the common tern breeding season (May-August) where feasible; ornithologist monitoring will be undertaken if works occur during this period.
- Implementation of all pollution prevention and water quality protection measures described in Attachment 4.3, including used of jerry cans, plant nappies, bunded storage of fuels and lubricants, availability of spill response equipment, daily inspection of plant and machinery, containment of drilling arisings and appropriate waste management procedures in line with best practice guidelines.
- A project-specific Pollution Incident Response Procedure shall be maintained on site throughout the works
- Adoption of drilling methodologies that minimise sediment mobilisation, including



the use of roto-sonic drilling techniques and continuous casing.

- All plant, equipment, vessels and personal protective equipment (PPE) shall be cleaned and inspected before mobilisation and demobilisation to minimise the risk of introducing or spreading invasive aquatic species.
- All works will comply with the relevant legislation, construction industry guidance and best practice.
- All works will comply with any permits or licences required.

The following guidance documents will be referred to and followed during the Proposed Project:

- CIRIA C532 – Control of Water Pollution from Construction Sites: Guidance for Consultants and Contractors.
- CIRIA C744D – Coastal and Marine Environmental Site Guide (Second Edition).
- CIRIA C811D – Environmental Good Practice on Site Guide (Fifth Edition).
- Inland Fisheries Ireland (IFI), 2016 – Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.
- NPWS (2014) – Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters.

1.4 Example RAMS documents

Provided overleaf



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