Project:	Port of Cork Expansion Works						
Client	Port of Cork Company						
Subject	Maritime Usage Licence Application – Proposed Maritime Usage						
Appendix	3.1						
Orig. by	DM	**Appr. by**	AA	**Date**	19/12/2025	**Doc. Ref:**	CORE2-AYE-RE-XX-TN-MA-0001

Proposed Maritime Usage

The proposed marine SI's (geotechnical survey, environmental surveys (including sub-tidal benthic and subtidal video surveys), intertidal benthic survey and marine mammals survey) will enable:

- Detailed mapping of nearshore shallow geological and seabed character;
- Reconnaissance level mapping of seabed relief and features (e.g. archaeology);
- Greater understanding of the seabed and sub-seabed conditions;
- Evaluation of the nature and mechanical properties of the superficial seabed sediments along the survey corridor;
- Aid in the classification of submerged habitats;
- Greater understanding of species distribution and abundance; and
- Baseline environmental mapping (i.e. habitats and species).

The knowledge gained from the proposed SI surveys will be used to minimise uncertainty in ground conditions at an early design stage.

Data acquired during the proposed SIs will be used to inform the design and assessment of any future projects in the area by providing information on the baseline environment and allowing impacts to be predicted, and subsequently appropriate mitigation to be developed, as applicable. The results of the proposed SIs may also be used at a later date to provide a baseline against which to monitor effects of construction, operation and decommissioning of marine infrastructure.

1 Borehole Investigation

1.1 Structural Boreholes

Structural boreholes were proposed to inform preliminary and detailed design. Twenty-five (25 No.) proposed structural boreholes were considered adequate to inform future design stages. The locations are shown in Figure1 – an extract of drawing CORE2-AYE-RE-XX-DR-MA-0101.

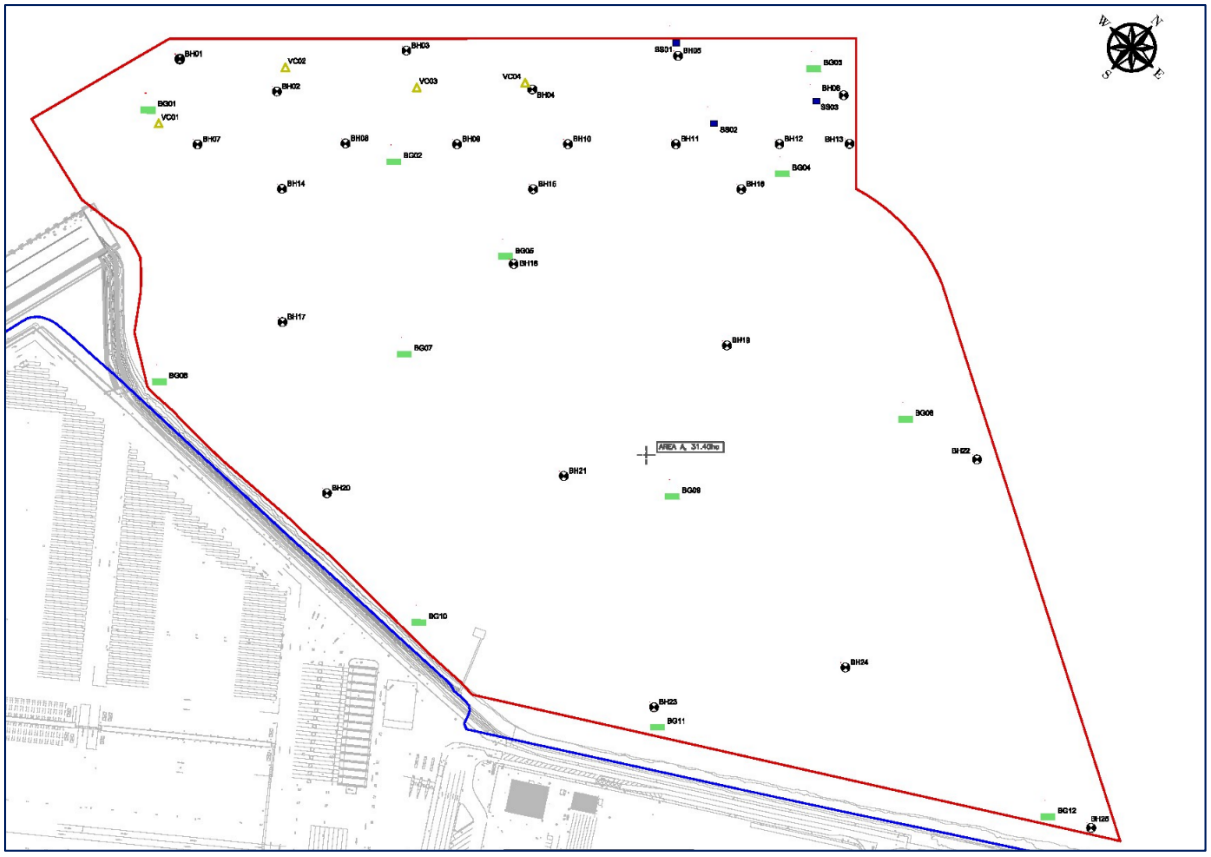

Figure 1: Proposed Site Investigation locations (Extract of CORE2-AYE-RE-XX-DR-MA-0101).

Each borehole will begin as a cable percussive boreholes bored to “refusal”. Boreholes in the area typically encounter “refusal” at depths ranging from 0.4m to 12.5m below seabed. Where refusal is encountered, rotary core drilling will follow at the same location. These follow-on boreholes are then generally drilled to a maximum depth of 25m below the seabed or to a depth of -30m CD with a casing diameter of 200mm

The maximum impacted seabed area is 0.8m^2 and the total volume of seabed material extracted is 20m^3.

1.2 Sediment Testing Borehole

Sediment samples will be obtained through vibrocore drilling (use of high frequency vibrations to drive a hollow tube into soft unconsolidated sediments) through soft estuarine overburden for recovery of soft soil and sediments. Sediment samples can also be obtained using surface samples (Van Veen grab) as required by the Marine Institute; however vibrocore drilling is more intrusive. In total, 4 vibrocores and 3 surface grab samples will be collected within the dredging area.

The vibrocore machinery to be used is approximately 4.5m tall when it is in transit and approximately 7m tall when the borehole is being driven. The machinery will be supported by a suitable vessel the Dennis Murphy.

For each vibrocore the footprint of the works on the foreshore will be four approximately 1 m^2. legs of the jack-up barge and the 105 mm temporary steel casing. The 106 mm steel casing is the diameter of the borehole. The vibrocore will be drilled up to 3m below the existing seabed.

There will be no permanent structures, all site investigation will be facilitated by temporary works. The moving marine plant will remain on site for the duration of the works. Associated sampling and testing (both in-situ and geotechnical/geo-environmental laboratory testing).

Proposed marine SI works will be conducted entirely from vessels within the marine environment.

The waste soil arisings from each borehole will be minimal based on the diameter of the casing and these will be brought on land for disposal at an appropriately licenced facility.

2 Radiological Testing

A sample will be taken within the proposed dredge area for radiological testing. The sample will be 1.5kg in wet weight and stored in a leak proof container clearly labelled with location and sampling date. These will be delivered to the EPA radiation Monitoring Laboratory for testing.

3 Benthic Grab Samples

It is proposed to collect surface subtidal grab samples from 8 locations within the immediate footprint of the proposed development. Additionally, 4 intertidal transects will be survey (Phase 1 walkover survey and Phase 2 quantitative surveys with cores collected at upper, mid and lower shore locations). The walkover survey will be undertaken on the hard-benthos intertidal areas within and immediately adjacent to the footprint of the hardstand area.

It is expected that 8 drop down video locations will be surveyed prior to grab sampling to assess the benthic community and determine suitability for grab sampling.

At each of the 8 subtidal stations within the vicinity of the proposed CORE development area, benthic faunal samples will be collected. Additionally, sediment samples will be collected for particle size analysis and organic carbon content. Similar samples (faunal and sediment) will be collected by core along the intertidal transects.

Subtidal sampling will involve the following:

- Single 0.1m^2 grab samples collected at each of the subtidal sampling stations;
- An additional grab will be collected for Grainsize and Loss on Ignition;
- Ancillary information will be recorded on pre-prepared data record sheets;
- Samples will be positioned using the vessel's GPS.
- Sample positions will be recorded when on site;
- Photographs will be taken of each sample; and
- Drop down video footage will be collected from each of the 8 locations. Additional DDV transects will be conducted around 5-10 stations within and adjacent to an extensive reef area

Intertidal sampling will include the following:

- Single stove-pipe core (0.028m2) will be collected at each intertidal sample station;
- A surface scrape will be collected at each site for Grain size and Loss on Ignition;
- Ancillary information will be recorded on pre-prepared data record sheets;
- Samples will be positioned using a hand-held GPS. Sample positions will be recorded when on site; and

- Photographs of the site will be collected at each location.

Grab samplers are used to recover samples from approximately the top 0.2 - 0.5m of seafloor. These samples may be used to classify the seabed, or for biological analyses. These samples are generally deployed overboard using a crane from a vessel.

There are various grab sampler types to include but not limited to Van Veen, Hamon and Day Grab samplers. Generally, some variants may come either as single or double, and in a variety of different sizes. Grab samplers generally comprises of steel buckets that are deployed open and which trigger shut when the sampler is in contact with the seafloor. As the buckets close, sediment and biological material are retained inside the sampler.

The grab sampler is then recovered to deck and place on a trestle or table. The retained material is then visually inspected for acceptance and then transferred to adequate container or on to a designated mat for further offshore processing and logging.

Single Van Veen Grab is ideal for the collection of sediment samples for biological and environmental sampling. In a range of sizes (0.025m^2, 0.1m^2, 0.2m^2, 0.3m^2) each model has a marine grade stainless steel bucket with hinged access flaps on the top allowing sub sampling of the collected sediment before it is emptied from the grab. The standard for this type of benthic faunal survey is 0.1m^2. The bucket is operated with a pair of stainless-steel lever arms that increase the tension to secure the sample securely in the grab as it is retrieved to the surface. Additional lead weights can be added to the back of the bucket to improve stability in strong currents and to the lever arms to increase the equipment's ability to perform in harder conditions.

Generally, any grab sampling will be carried out by deploying sampling gear from the vessel, as per standard operation procedure for deck works involving this kind of equipment taking into account the technical specification of the grab in use. Various grabs will be available for the benthic survey provision to ensure adequate sampling equipment for various sediment types. From the grab samples a small amount of sediment can be retained for Particle Size Analysis and Loss on Ignition Analysis.

Van Veen/other suitable methods will be used for soft sediments for quantitative benthic infauna analysis and for physio–chemical analysis. Colonial and epifaunal species will be recorded qualitatively. Sediment samples for physio–chemical analysis will be acquired for later laboratory analysis.

Mini and Standard Hamon Grabs (0.1m^2 and 0.2 m^2 respectively are particularly used for the collection of samples generally from coarse (sand and gravel) sediment substrates and used for benthic macrofauna and particle size measurement. The grab is relatively simple to operate in almost any water depth.

A 0.1m² sample area is a standard practice used in many benthic sampling applications. The Hamon Grab is a box shaped sampling scoop mounted in a triangular frame. Upon contact with the seabed, tensioned wires are released, which causes the sampling bucket to pivot through 90º pushing seabed sediment into the bucket. On completion of its travel the open end of the bucket comes against a rubber sealed steel plate which stops the sediment escaping during recovery. 0.1m² Hamon Grab refers to 0.1m² area of seabed sampled. The depth of scoop penetration is up to 20cm. On recovery the grab is landed onto a rectangular base from where access can be gained to the inside of the bucket via an inspection window. Whilst in the stand the grab sample can then be easily emptied into a sampling container located under the bucket.

In any case where benthic sampling is not possible, sufficient video and stills will be taken from the sample location to identify existing habitats (to include Annex I habitats) and the habitat boundaries.

This survey provides camera footage to aid in the classification of submerged habitats and is a non-invasive survey for habitats and fauna. The survey period for benthic habitats is year-round.

4 Intertidal Survey

This survey involves a series of cores to be taken in the soft sediment intertidal sections of the proposed CORE redevelopment.

At each site typically

1. a single stove-pipe core (19cm Ø) is taken for macrofaunal analysis.
2. A single sediment scrape is taken from the sediment surface for Particle Size Analysis (PSA) and Loss on Ignition (LOI).
3. A photographic record is taken. Notes of sediment type and obvious epibenthos are recorded.

The survey period for intertidal habitats is April to the end of September.

5 Drop down Video Survey

The drop-down camera to be used is the STR SeaSpyder Nano, an ultra-compact system offering high-resolution digital imaging and photographic-quality illumination. The system featured the latest generation STR SeaCam Mini IP camera and two ultra-efficient STR SeaLight LED lights, installed on a lightweight deployment frame with a 50m Kevlar-reinforced umbilical. Real-time HD video was captured using the supplied STR VidOverlay software. Laser scaling is integrated into the camera system, which was essential for conducting an assessment and for accurately measuring percentage cover.

Short drifts will be used at each drop-down video station, with video recorded along each transects, with the camera positioned approximately 50cm to 1m above the seabed. The camera was landed on the seabed along each transect, enabling an assessment of spatial variability.

At each station, the immediate survey area was checked for obstructions, such as static gear. Notes will be made in-situ on visible sediment conditions, seabed features, flora and fauna, and notable sensitive and protected species, along with the DGPS position, water depth, date, and time.

The camera will be lowered to the seafloor and a recording made of the bottom type and flora and fauna encountered. Once the camera was recording, the boat is allowed to drift with the current during filming (for approximately two minutes) to get representative footage along each camera deployment. All captured video footage is reviewed, and substrate type and characterising species noted and used to assess any changes in the environment.

The survey sites are in the sublittoral zone, in areas of low to medium energy, exposed to tidal action. There will be 18 locations studied. Stations will cover the entire expanse of Ringaskiddy CORE2, and depths ranging from 1 m to 16 m.

6 Beam Trawl Methodology

The survey utilises a two-metre-wide beam trawl equipped with a tickler chain and an 11 mm mesh, which is towed at a speed of 1.5 to 2.5 knots from the A-frame at the stern of the vessel. The beam trawl will be deployed from the Denis Murphy (Port of Cork).

For this survey in the Ringaskiddy area, five beam trawl transects (T1 to T5) will be conducted. The track of each trawl was recorded using a handheld GPS and will be plotted. After each transect, the beam trawl will be recovered, the cod end sack opened, and the catch will be deposited into a fish box. If a trawl contained a significant amount of mud, staff will use a deck hose and a 1 mm sieve to clean the catch upon retrieval. Most of the catch from each trawl will be processed on deck by consultancy staff, with some species retained for identification upon return to the selected laboratory. Brown shrimp (*Crangon crangon*) and green crab (*Carcinus maenas*) species will be identified and measured on board.

For this survey the catch of organisms will be separated, identified, counted and the total length (the tip of the snout to the tip of the longer lobe of the caudal fin) of selected fish specimens measured to the nearest millimetre. Every attempt will be made to return them alive to the water after processing. The size distribution of organisms such as green crabs (*Carcinus maenas*) and brown shrimp (*Crangon crangon*) will also be assessed.