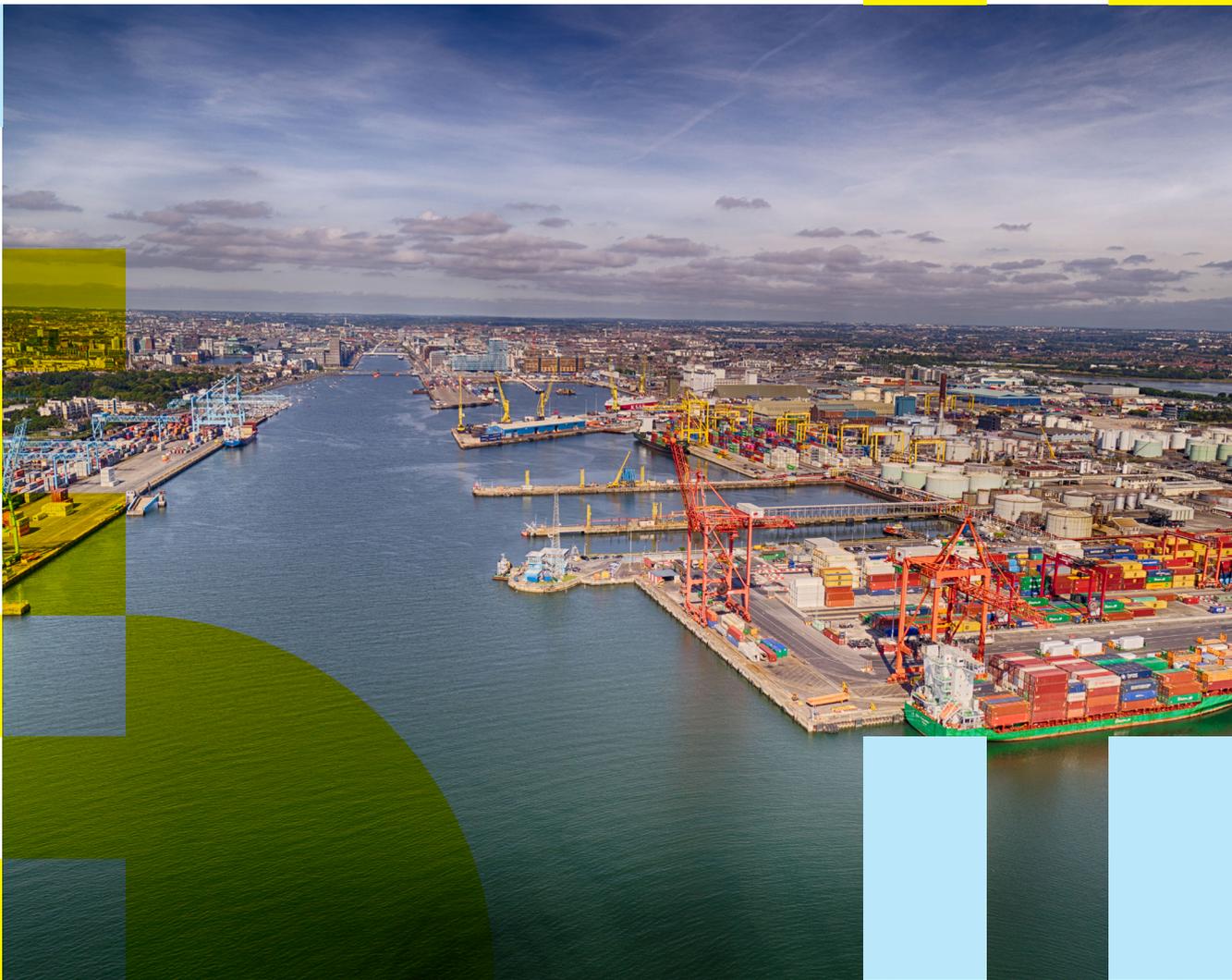
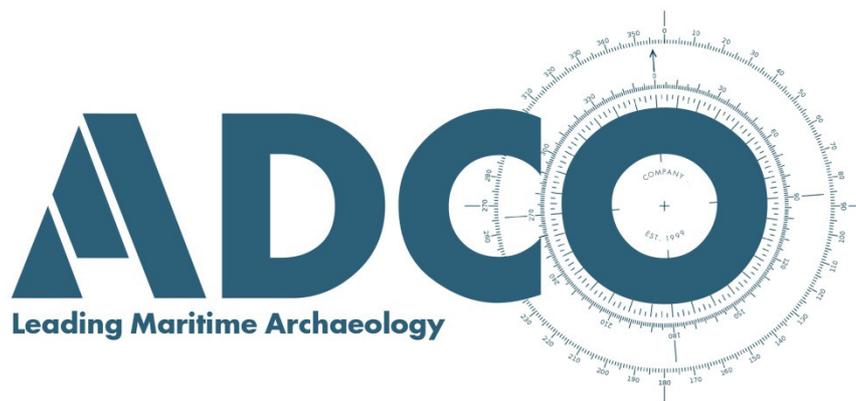


Environmental Impact Assessment Report

Appendix 16.4

Volume 3 Part 8

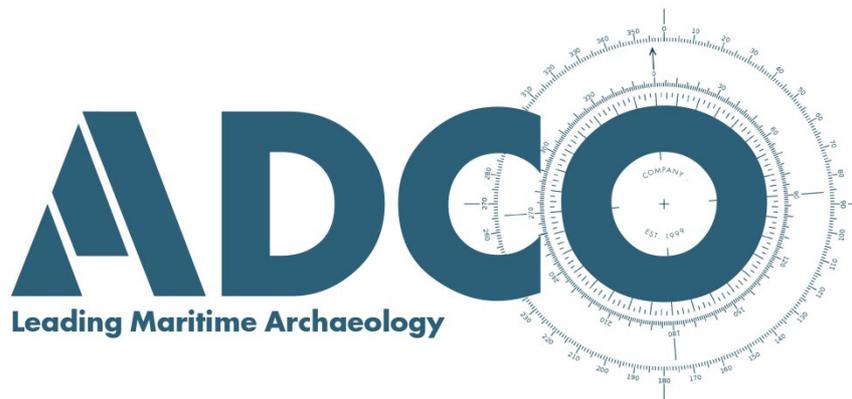




**3FM Project
Advance Site Investigation 2022-2023
Dublin Port**

**Archaeological Monitoring Report
22E0007, 22D0001, 22R0003**





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**Archaeological Monitoring Report
22E0007, 22D0001, 22R0003**

21 August 2023

Project Director
Report

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LIST OF ABBREVIATIONS

ADCO	The Archaeological Diving Company Ltd
AIA	Archaeological Impact Assessment
CD	Chart Datum
DHLGH	Department of Housing, Local Government & Heritage
CPT	Cone Penetration Test
E	Easting
N	Northing
HWM	High Water Mark
ITM	Irish Transverse Mercator
LWM	Low Water Mark
NGR	National Grid Reference
NMI	National Museum of Ireland
NMS	National Monuments Service
NORA	National Oil Reserves Agency
OD	Ordnance Datum
OS	Ordnance Survey OD
PMO	Project Management Office
RMP	Record of Monuments and Places
JUB	Jack-Up Barge
RPS	Record of Protected Structures
SMR	Sites and Monuments Record
SPT	Standard Penetration Test
UAIA	Underwater Archaeological Impact Assessment
UAU	The Underwater Archaeology Unit
UT	Unopened Tin

EXECUTIVE SUMMARY

The Archaeological Diving Company Ltd (ADCO) was appointed by RPS, on behalf of Dublin Port Company (DPC), to undertake archaeological monitoring of Advance Site Investigation (SI) to inform the design phase of the 3FM project.

The 3FM project complements the preceding Alexandra Basin Redevelopment (ABR) and MP2 projects, aiming to complete the development of Dublin Port and bring it to its ultimate and final capacity by 2040. The project comprises a number of components, including the following:

- Creation of a new Southern Port Access Route (SPAR).
- New Ro-Ro Terminal (South Bank Quay) to be constructed at the location of exiting Berths 42-45.
- Construction of a new Container Terminal, replacing the existing Berth 48/Oil Jetty (Plot N and O).
- Dredging of a Waterside Turning Circle (325m diameter) off Pigeon House Harbour.
- A series of Community Gain initiatives to be implemented as part of the project.

The Marine SI was undertaken by Fugro and comprised the gathering of geotechnical data from thirty-two (32) marine boreholes, taken from a series of locations along the southern side of the navigation channel, extending from the downstream side of Tom Clarke (East-link) Bridge to the NORA Oil Jetty at Poolbeg.

Land-based site investigations were also conducted across the Poolbeg peninsula and included the excavation of SI trenches at seven (7) locations between the Marine Terminals (MTL) Yard and the NORA Oil Storage Terminal.

Marine SI work commenced on the 30th of November 2022 and was completed on the 17th of February 2023. ADCO is familiar with both the working platform, the Fugro *Aran 120*, and the nature of the seabed within Dublin Port; having previously undertaken monitoring of SI works from the same platform in 2017, for the ABR project, and earlier in 2022, for the MP2 project.

Archaeological monitoring of the Marine SI was undertaken on a 24hr basis, a single archaeologist monitoring each 12-hr cycle. Land-based monitoring was undertaken by a single archaeologist, working to the drilling schedule (daylight hours) of the onsite contractor.

Both aspects of the monitoring work were conducted under licence from the Department of Housing, Local Government, and Heritage (DHLGH); licence numbers 22E0007, 22D0001, and 22R0003.

No material/deposits of archaeological or historic significance, or any distinct layers of archaeological potential, were observed as part of the monitoring process.

The following report provides a factual account of the archaeological monitoring programme and outlines the methodology used. A detailed (daily) narrative of the subsurface strata for each borehole was also recorded, as detailed in Appendix 1 of the report.

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1.0 INTRODUCTION

The Archaeological Diving Company Ltd (ADCO) was appointed by RPS, consulting engineers on behalf of Dublin Port, to undertake archaeological monitoring of Advance Site Investigation as part of the design phase of the Dublin Port 3FM project (Figure 1).

The marine phase of archaeological monitoring was undertaken by Fugro over a 110-day period, commencing 30th October 2022, while land-based site investigations were intermittently undertaken by Causeway Geotech Ltd. over a 17-day period, commencing 23rd January 2023. All monitoring was carried out under license from the DHLGH, license numbers 22E0007 (Excavation), 22D0001 (Dive Survey), and 22R0003 (Detection-device).

2.0 MARINE SITE INVESTIGATION

A programme of Site Investigation works was required to inform the preliminary design of the various infrastructural elements of the 3FM project. The advance site investigation works comprised thirty-two (32) geotechnical exploratory boreholes (Table 1, Figure 2). Three (3) of these boreholes (BH-S-7, B-H-S8, and B-H-S9) were additional to the original scope of works for the SI programme. The marine works were carried out by Fugro and followed on from the SI works carried out for the MP2 project, both programmes being undertaken as part of the same mobilisation.¹ The working platform (jack-up barge) used for the operation was the Fugro *Aran 120* (Plate 1).

ID	Proposed Location		Actual Location		Offset [m]
	Easting	Northing	Easting	Northing	
BH-B01	718093	734285	718093.70	734281.36	3.69
BH-B-02	718106	734237	718107.95	734236.82	1.80
BH-S-01	718265	734179	718266.77	734178.99	1.83
BH-S-02	718276	734209	718277.21	734208.92	1.06
BH-S-03	718451	734125	718452.53	734125.03	1.31
BH-S-04	718457	734149	718454.50	734150.52	2.48
BH-S-05	718615	734103	718614.95	734103.86	1.40
BH-S-06	718621	734134	718621.80	734133.30	0.57
BH-S-07	----	----	718613.19	734094.76	----
BH-S-08	----	----	718532.53	734104.42	----
BH-S-09	----	----	718351.72	734141.12	----

¹ As such, both projects fall under the same DHLGH licence numbers; the licences issued for the MP2 SI work being extended to cover the 3FM SI work.

ID	Proposed Location		Actual Location		Offset [m]
	Easting	Northing	Easting	Northing	
BH-K-01	718939	734106	718885.19	734119.62	55.59
BH-K-02	719324	734048	719415.78	734056.11	91.85
BH-TC-01	720242	733910	720241.36	733908.96	1.16
BH-TC-02	720242	733878	720242.91	733876.93	1.86
BH-TC-03	720242	733863	720241.46	733864.94	1.49
BH-TC-04	720090	733958	720090.30	733956.56	1.49
BH-TC-05	720184	733946	720183.27	733948.14	2.48
BH-TC-06	720415	733947	720414.65	733947.46	0.21
BH-TC-07	720399	733899	720400.24	733899.44	1.10
BH-N-01	720478	733957	720476.39	733956.39	1.54
BH-N-02	720694	733965	720692.63	733964.77	1.78
BH-N-03	720911	733974	720910.30	733972.53	1.16
BH-N-04	721127	733982	721127.17	733985.84	3.97
BH-N-05	721208	733947	721207.42	733947.81	0.57
BH-N-06	721021	733928	721021.58	733927.83	0.55
BH-N-07	720805	733919	720803.74	733918.61	1.13
BH-N-08	720588	733911	720588.38	733901.41	9.69
BH-N-09	720482	733857	720481.93	733856.71	0.36
BH-N-10	720698	733865	720697.20	733864.24	1.45
BH-N-11	720915	733866	720914.29	733867.98	1.72
BH-N-12	721035	733875	721035.39	733874.40	0.92

Table 1: Proposed/actual location of marine boreholes gathered as part of the SI works for the 3FM project.

Marine SI works were required to inform appropriate construction design by determining the various stratum types that are present across the development footprint. The quantity/location of the boreholes and corresponding rationale for these boreholes is provided below in Table 2.

SPAR Bridge Crossing
<p>Two (2) boreholes were completed:</p> <ul style="list-style-type: none"> 1nr. located at the likely main pier location to confirm suitability of ground conditions for design and construction of the bridge and <p>1nr. along bridge alignment to confirm consistency of ground conditions in relation to design and installation of abutment/pier.</p>

SPAR Bridge and Revetment
Nine (9) boreholes were completed including three (3) additional to the proposed: <ul style="list-style-type: none"> Boreholes required to guide form of construction along SPAR (piled wall vs revetment) Boreholes required in marina to inform preliminary design of pontoon locating piles and dredging.
Plot K
Two (2) boreholes completed: <ul style="list-style-type: none"> 1nr. at the proposed link-span ramp location to inform preliminary design of link-span pile(s) and 1nr. at western end of Area K.
Turning Circle
Seven (7) boreholes were completed, positioned to provide a ground profile to inform the preliminary design of the following: <ul style="list-style-type: none"> Dredging and dredged side slopes Interface of side slope with existing ground profile at reclaimed land/Great South Wall (consideration of piled retaining structure, armoured revetment, or combination of both) Tern colony protection structures (foundation/pile requirements)
Plot N
Twelve (12) boreholes completed (within the proposed hardstanding footprint of Area N), positioned to inform the preliminary design of the following: <ul style="list-style-type: none"> Main quay infrastructure. Internal piling for open pile structure possibility. Land reclamation for solid structure/infill possibility. Jetty and dolphin design at eastern end of Plot N. Dredging and dredged side slopes.

Table 2: Location/number of marine boreholes within each of the riverine development areas associated with the 3FM project.

The marine boreholes ranged between 100mm and 200mm in diameter. It was planned to extend the borehole to a maximum depth of c. -43.5m below existing bed-levels; the depth achieved being dependent on the ground conditions encountered during the site investigation work itself. However, this depth was surpassed for a number of boreholes, including BH-N-12 which achieved a maximum depth of -65.2m.

Samples were retrieved at regular vertical intervals from the upper strata (typically -0.5m to -1.5m) and these were retained for sediment identification/classification and laboratory testing.

All spoil and samples collected by the on-board geotechnical team were subject to archaeological monitoring (Plates 2-3). The stratigraphy of the seabed strata at each borehole location was also recorded, as presented in Appendix 1 of this report.

2.1 Monitoring Methodology

A total of twenty-nine (29) boreholes were originally planned, with three (3) boreholes added during the onsite phase of the project. The gathering of geotechnical data from these marine boreholes was subject to archaeological monitoring by ADCO; a single archaeologist being present on each 12-hour dredge cycle in the 24hr operation. Observations were made on the

deck of the Jack-up barge and full access was given to the retrieved material. At predetermined depths, within each borehole location, samples were taken and retrieved in thin-walled steel tins (UT). These tins measured 1.5m in length and 100mm in diameter. The top and bottom of these tins were subject to inspection by the monitoring archaeologist, prior to the sample being capped with a wax-plug and wrapped for storage (Plate 4).

Standard penetration tests (SPT) were also conducted at predetermined depths and samples of the recovered material taken. These samples were inspected by the monitoring archaeologist before sampling (Plate 5). A comprehensive site archive was maintained throughout the project.

2.2 General Observations

The stratigraphy encountered during the project was relatively consistent, maintained to varying depths from within the main deposit categories, as tabulated below in Table 3. An exception to this was BH-S-04, where an amorphous peat was encountered at a depth of between -8m and -9m, sitting on top of a stratum of sandy gravel. Natural wood fragments were also encountered from BH-S-04, at these depths, and from BH-S-03 at depths between -4.5m and -8m (Plates 6-7). The presence of these peat and timber fragments may indicate the location of an area within the channel once known as the 'Green Patch', as illustrated on a number of early maps of Dublin Bay.²

Made Ground	<ul style="list-style-type: none"> Dark grey to black, silty-clay, and/or gravel with a sulphurous odour at upper levels. Material sometimes with a hydrocarbon odour.
Estuarine Deposits	<ul style="list-style-type: none"> Light grey to grey, loose to medium dense, sand and gravel. Soft to firm grey clay/silt, thin laminated with occasional organic rootlets Medium dense to dense grey clayey, silty sand and gravels.
Port Clay	<ul style="list-style-type: none"> Firm to stiff, dark-brown to grey clay becoming gravelly at base.
Glacial Till	<ul style="list-style-type: none"> Gravels and cobbles, silty or clean, angular to rounded (of mixed lithologies), predominantly limestone and sandstone.
Bedrock	<ul style="list-style-type: none"> Limestone, non-intact at surface- recovered as angular to sub-angular gravels of limestone with occasional sandstone and mudstone.

Table 3: Basic cable stratigraphy present within the project area.

2.3 Positional Data

Proposed borehole locations varied from the actual locations. The actual locations were collected from on-board DGPS positioning equipment, as detailed in Table 1.

2.4 Conclusion

² The 'Green Patch' is illustrated in Dublin Surveyor Gabriel Stokes' map of the Bay and Harbour of Dublin dated 1728, engraved, and published by Bowles London. See also DPC online archive map dated 1704 of 'The Harbour of Dublin from Essex Bridge to the Barr'.

The 3FM Site Investigations were successfully concluded. The monitoring was systematic and comprehensive in nature. No material, deposits, or structures of archaeological or historic interest were impacted by the site investigations. Moreover, given that there was only one (1) modern find and five (5) samples, recovered predominantly from dynamic and unsecured contexts, no additional onsite mitigation measures were required for the Marine SI work (Plate 8, Table 4).

Borehole ID	Find/Sample	Type	Depth [-m]	Description
BH-S-03	F001	Ceramic	1.0m – 1.5m	Modern white glazed pottery (see Plate 4).
BH-S-03	S001	Clinker	1.0m – 1.5m	Possible fragment discarded coal-burning steamships slag/clinker.
BH-S-04	S002	Wood	8m	Pieces of brushwood recovered from the top of an unopened tin (UT) at 8m; measuring between 25mm and 40mm in length and 5mm to 15mm in diameter. Natural timber recovered within an amorphous peat (see Plate 5).
BH-N-06	S003	Bone	0.0m – 0.5m	Fragment of animal bone.
BH-TC-01	S004	Bone	0.0m – 0.5m	Fragment of animal bone.
BH-K-01	S005	Timber	1.5m – 2.0m	Small fragment of timber.

Table 4: Samples and find recovered from the drilling operations.

3.0 TERRESTRIAL SITE INVESTIGATION

A programme of land-based site investigation works was undertaken on the south side of the channel. This work was carried out by Causeway Geotech Ltd. and included the excavation of seven (7) site investigation trenches (Table 4, Figure 3):

- **TR1-TR5**, excavated on the east side of Pigeon House Electricity Generating Station, along an exit and entrance route of a proposed new container terminal.
- **TR6**, excavated at the proposed entrance to Plot K, and
- **TR7**, excavated at the GSW, opposite the NOAR soil storage site (Table 4).

3.1 Monitoring Methodology

The excavation of each trench, using a 2-ton tracked machine excavator, was subject to archaeological monitoring. The resulting spoil was placed to the side of each trench for visual inspection and metal-detection. A detailed written and photographic log was made for each of the site investigation trenches.

ID	Location [ITM]	Dimensions (m)	Stratigraphy (-mm)	Notes
Trench 1 [3FM-BH208]	Pidgeon House Generating Station [ITM 720452E, 733788N].	1.6m L x 0.6m W x 0.9m D	200mm – Sand 700mm - Silt with inclusions of red brick.	Starter Trench for 3FM-BH208. Concrete encountered at base of trench so discontinued
Trench 2 [3FM-BH208]	Pidgeon House Generating Station [ITM 720450E, 733786N].	1.6m L x 0.6m W x 0.4m D	200mm – Sand 200mm - Silt with inclusions of scrap steel.	Starter Trench for 3FM-BH208. Concrete encountered at base of trench so discontinued
Trench 3 [3FM-BH207]	Pidgeon House Generating Station [ITM 720408E, 733692N].	1.6m L x 0.6m W x 0.7m D	200mm – Sand 500mm - Silt with inclusions of red and yellow brick	Starter Trench for 3FM-BH207. Concrete encountered at base of trench so discontinued
Trench 4 [3FM-BH207]	Pidgeon House Generating Station [ITM 720410E, 733690N].	2.1m L x 0.6m W x 0.8m D	10mm – Topsoil 200mm – Sand 200mm - Black silt 400mm - Brown fine silt	Starter Trench for 3FM-BH207. Concrete encountered at base of trench so discontinued
Trench 5 [3FM-TP203]	Pidgeon House Generating Station [ITM 720435E, 733740N)	2.5m L x 0.6m W x 0.1m D	10mm - Topsoil	Slit trench 3FM-TP203. Concrete encountered at base of trench so discontinued
Trench 6 [3FM-BH214]	MTL Yard [ITM 719321E, 733884N]	1.5m L x 0.6m W x 1.1m D	100mm – Tarmac 300mm – Concrete 700mm - Stiff, light brown silt with high gravel and cobble content	Starter Trench for 3FM-BH214. Concrete encountered at base of trench so discontinued
Trench 7 [3FM-BH212]	Great South Wall [ITM 721107E, 733825N]	2.0m L x 1.0m W x 2.4m D	300mm - Rubble stone and sand 2.5m – Sand 2.5m - 3.5m Medium dense sand and rounded Gravel. Sand is fine-coarse with shell fragments. 3.5m - 5.0m Medium dense brown, fine to medium Sand with medium cobble content. 5.0m - 8.0m Medium dense grey Sand and Gravel with medium cobble content. Sand is medium with shell fragments. 8.0m - 10.2m Medium dense well-rounded Cobbles with fine to medium sand.	Starter Trench for 3FM-BH212. Exposed the southern face of the GSW.

Table 4: Stratigraphy of land-Based SI works

3.2 General Observations

The presence of concrete, close to the surface of in TR1-TR6, prevented further investigation of underlying stratigraphy within those trenches. The excavation of trenches TR1-TR2 was an attempt at a starter trench for Borehole FM-BH208 and trenches TR3-TR4 for Borehole 3FM-BH207.

However, the starter trench for borehole 3FM-BH212 (TR7), which was excavated on the landward (southern) side of the GSW (opposite the NOAR site), did expose part of the sea-wall. The trench measured 2m length (west-east), 1m width, and 2.4m in depth. The trench exposed the southern face of the sea-wall to a depth of 2m, at which point an inundation of seawater made further visual inspection unfeasible.

The seal-wall is built of dry rubble-stone, with its surface and sides faced with granite ashlar blocks. The blocks are well bonded, but laid dry, except on the top where the joints are pointed. The sides of both the inner and outer walls are battered; approximately 1 in 7. Each course of granite masonry measured 400mm in depth, with a horizontal offset of 50mm from the underlying blockwork (Plates 9-10).

The spoil from the TR7 consisted of a compact layer of rubble stone and sand overlying clean sand with relatively few inclusions. Red tile and a brick fragments were observed. Before reclamation of this area, in the late 1960's/70's, a natural accumulation of sand had begun to form on the south side of the GSW. By the time the OS First Edition map (1837), a bank of sand, known as the 'White Bank', was present at this location (Figure 4); comprising an area of natural reclamation that was stable enough to support a small wooden structure at that time.

An Act passed on in July 1877, *Rathmines and Pembroke Main Drainage and Improvements*, enacted the construction of a main sewage drain and outflow. After leaving Irishtown, the sewer crossed the strand in an embankment and enclosed c. 25-acres of foreshore extending back to Ringsend. It then passed along Pigeon House Road, through Pigeon House Fort, and along the line of the GSW to reach its terminus at the White Bank; where it passed through the sea-wall to discharge into the river. The construction and installation of the Pembroke Main Drain would have disturbed the natural deposits of sand along the GSW, and likely explains the inclusion of the red tile and a brick fragments encountered during the excavation of TR7.

On completion of the starter trench (TR7), drilling of the borehole (3FM-BH212) commenced at a depth of -2.5m. The borehole was drilled to a depth of -10.2m by cable percussion drilling, at a point 750mm from the southern edge of GSW (Plate 11). No material, deposits, or features of archaeological interest were observed as part of the drilling process.

3.3 Conclusion

Starter trenches TR1-TR6 did not allow for visual inspection/assessment of deposits beneath the concrete sub-stratum; encountered at depths of between 200mm and 700mm below ground level. However, the excavation of TR7 did allow inspection of the southern face of the GSW, confirming that this section conforms to the build structure observed elsewhere along the sea-wall.

4.0 ACKNOWLEDGEMENTS

Thanks are extended to Mairead Rushe (PMO) Client Contact at Dublin Port, Alan Bar, Technical Director, RPS, and to Eamon McElroy, Chief Engineer Dublin Port for their assistance with the project. Particular thanks are extended to Nick Morton (Project Manager, Fugro) and to the Bargemaster and Crew of the Fugro *Aran120* for accommodating ADCO's monitoring personnel.

The ADCO Archaeological Monitoring Team comprised: Rex Bangerter (Project Manager & Monitor), Dominick Gallagher (Monitoring Archaeologist), Mathew Conway (Monitoring Archaeologist), and James Leahy (Monitoring Archaeologist). The report was written by Bangerter and Gallagher.

Appendix 1: Stratigraphy Sequence, Marine Boreholes

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-B-01	718092.899E, 734284.964N	30/10/2022	RB & JL	---	---	---
Notes: Borehole located mid channel, approximately 45m downstream from East Link Bridge. Excavated to a depth of 28.60m. Borehole was originally scheduled to be at 718070E, 734284N but was adjusted during project.						
Metres from Surface		Description				
0.00m - 0.50m		Very soft, sandy, clayey SILT with strong sulphurous odour and rare leaves and rootlets. Sand is fine and medium. [Made ground]				
0.50m - 4.50m		Very soft, black, slightly sandy, silty CLAY with strong hydrocarbon odour. Sand is fine. [Made ground]				
4.50m - 5.20m		Very soft, black, slightly sandy, slightly gravelly, silty CLAY with strong hydrocarbon odour. Sand is fine. Gravel is subrounded fine of siltstone psammite and limestone. [Made ground]				
5.20m - 6.00m		Dense, black, slightly sandy, clayey GRAVEL with low cobble content. Sand is medium and coarse. Gravel is subangular and subrounded fine to coarse of limestone, psammite, and siltstone. Cobbles are (90mm x 80mm) subangular of and siltstone. [ESTUARINE DEPOSITS]				
6.00m - 10.60m		Stiff, dark grey, silty, sandy, gravelly CLAY with low cobble content with rare shell fragments (2mm x 10mm). Sand is fine to coarse predominately medium and coarse. Gravel is subangular and subrounded fine to coarse predominately fine and medium of limestone, psammite, and siltstone. Cobbles are (100mmx80mm) subangular of limestone and siltstone. [TILL]				
10.60m - 10.90m		Black to dark grey, silty, sandy GRAVEL with low cobble content. Sand is medium and coarse. Gravel is subangular and subrounded medium and coarse limestone and siltstone. Cobbles are (100mm x 90mm) subangular of limestone. [TILL]				
10.90m - 12.75m		Stiff, grey, sandy, gravelly, silty CLAY. Sand is medium and coarse. Gravel is angular and subrounded fine to coarse predominately fine and medium of limestone, siltstone, and psammite. [TILL]				
12.75m - 13.40m		No recovery.				
13.40m - 13.60m		Dark grey and brownish grey COBBLES with a little brown sandy clay. Cobbles are subrounded of strong dark grey and brownish grey fossiliferous LIMESTONE with rare calcite pockets. (< 2mm).				
13.60m - 14.35m		No recovery.				
14.35m - 14.85m		Dark grey, slightly sandy, clayey GRAVEL with occasional pockets (<60mm) of firm dark grey sandy gravelly clay. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of limestone, rare psammite. [TILL]				
14.85m - 15.50m		Strong black micritic LIMESTONE with rare subvertical calcite veins. [LIMESTONE BEDROCK]				
16.03m - 18.10m		Medium strong dark grey to black micritic LIMESTONE with calcite veins. [LIMESTONE BEDROCK]				
18.10m - 18.55m		Weak thinly laminated black argillaceous LIMESTONE non intact recovered as very clayey slightly sandy angular and subangular fine to coarse gravel of limestone. Sand is fine to coarse. Moderately weathered.				
18.55m - 18.90m		Moderately weak dark grey micritic LIMESTONE. Fresh. Highly fractured.				
18.90m - 19.15m		Very stiff dark thinly laminated very closely and extremely closely fissured grey CLAY.				
19.15m - 28.60m		Strong to weak, dark grey to black micritic LIMESTONE, with calcite veins. [LIMESTONE BEDROCK]				

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-B-02	718106.167E, 734236.569N	01/11/2022	DG & JL	---	---	---
Notes: Borehole was located approximately 70m downstream of East Link Bridge.						
Metres from Surface		Description				
0.00m - 1.00m		Very soft, black slightly sandy, silty CLAY with rare rootlets. Sand is fine. Sulphurous odour. [MADE GROUND]				
1.00m - 4.50m		Very soft, black, slightly sandy, clayey SILT with rare rootlets (<1mm x 30mm) locally with rare shell fragments (<5mm) and plastic fragments (<10mm). Slight hydrocarbon odour. Sand is fine.				
4.50m - 5.50m		Very soft and soft, dark grey, slightly sandy, silty CLAY with rare rootlets (<1mm x10mm). Sand is fine. [Possibly Made Ground]				
5.50m - 6.50m		Soft black slightly sandy slightly gravelly CLAY. Sand is fine. Gravel is subangular and subrounded fine of limestone. [Possible alluvium]				
6.50m - 9.00m		Stiff dark brown slightly sandy gravelly CLAY with occasional shell and shell fragments of bivalves (<50mm). Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of limestone, psammite, quartzite, vein quartz, mudstone. [TILL]				
9.00m - 9.50m		Grey very gravelly silty SAND with frequent pockets (<60mm) of stiff brown gravelly clay. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of limestone with occasional psammite and quartzite.				
9.50m - 10.00m		Very stiff dark greyish brown slightly sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of limestone, quartzite. Cobbles are angular of limestone (<140mm x130mm x70mm). [TILL]				
10.00m - 11.93m		Very dense Dark brownish grey and dark grey sandy clayey GRAVEL with low cobble content and frequent pockets(<80mm) of very stiff dark brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of limestone, with occasional quartzite, basalt, psammite. Cobbles are subrounded of limestone (<150x120x110mm) [TILL]				
11.93m - 13.00m		Dark grey slightly sandy clayey GRAVEL with low cobble content with rare seams (<60mm) of firm dark grey sandy gravelly clay. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of limestone, psammite. Cobbles are (150mm x 80mm x 80mm) angular to subrounded strong dark grey limestone with randomly oriented occasional calcite veins (<8mm). [TILL] 12.43m to 12.70m; assumed zone of core loss.				
13.00m - 14.70m		No Recovery. Assumed zone of core loss.				
14.70m - 17.20m		Dark grey, sandy, clayey GRAVEL with low cobble content with occasional pockets of sandy, gravelly clay.				
17.20m - 17.70m		Medium strong and strong grey micritic LIMESTONE with rare subvertical calcite veins (<2mm). [Limestone Bedrock]				
17.70m - 17.90m		Non intact recovered as clayey slightly sandy angular and subangular fine to coarse of weak dark grey limestone. Sand is found too coarse. Moderately weathered. [Limestone Bedrock]				
17.90m - 29.30m		Limestone of varying strengths, fractures, and inclusions. Sand and clay bands within. [Limestone Bedrock]				

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-S-01	718264.960E, 734178.724N	04/11/2022	DG & JL	---	---	---
Notes: Borehole located on the south side of the channel approximately 70m from the EAST LINK Toll Booth which lies to the southwest.						
Metres from Surface		Description				
0.00m - 1.00m		Very soft, black, slightly sandy, clayey SILT with rare, decomposed wood fragments <10mm). Moderate sulphurous odour. Sand is fine. [MADE GROUND]				

1.00m - 1.50m	Soft and very soft, black, slightly sandy, silty CLAY with occasional wood fragments (<5 x 30mm). Sand is fine.
1.50m - 2.50m	Firm black slightly sandy silty CLAY with some shell fragments (<20mm), rare angular fine to coarse gravel of limestone and rare brown silt burrows (<5 x 30mm). Sand is fine. Moderate hydrocarbon odour. [possibly made ground]
2.50m - 4.90m	Soft and very soft black slightly sandy silty CLAY with occasional rootlets (<1 x 20mm) rare angular fine to coarse gravel of limestone and shell fragments (<50mm) of scallop and bivalves. Sand is fine. [Estuarine Deposits]
4.90m - 5.90m	Soft dark brown to brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of limestone. UT at 5.50 to 6.0m
5.90m - 6.20m	Oversample. Grey very gravelly clayey SAND. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of limestone, quartzite, psammite.
6.20m - 7.50m	Firm to stiff light brown slightly sandy slightly gravelly silty CLAY with occasional lenses (<150mm) of silty fine to coarse sand. Sand is fine. Sand is fine to coarse gravel is angular to subrounded fine and medium of limestone, psammite. [possible till]
7.50m - 8.00m	Soft and very soft brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular fine of limestone.
8.00m - 11.00m	Stiff dark brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of limestone, psammite, quartzite. [TILL]
11.00m - 16.40m	Very stiff dark grey sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of limestone, psammite, quartzite. Cobbles are (140mm x 80mm) angular fragments of dark grey limestone. [TILL]
16.40m - 18.60m	Dark grey and greenish grey slightly sandy clayey GRAVEL with low cobble content and rare seams (<70mm) of dark grey sandy gravelly clay. Gravel is angular to subrounded fine to coarse of limestone psammite. Cobbles are (140mm x 90mm) angular to subrounded of strong dark grey limestone with rare randomly oriented calcite veins (<20mm) [TILL]
18.60m - 23.60m	Medium strong and strong dark grey micritic LIMESTONE with rare subvertical penetrative calcite veins (<30mm). Non intact recovery at times [LIMESTONE BEDROCK]
23.60m - 28.50m	Strong dark grey and black micritic LIMESTONE. 23.60m to 24.33m; highly fractured zone.

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-S-02	718276.285E, 734209.452N	03/11/2022	DG & JL	---	S002	---
Notes:						
Metres from Surface		Description				
0.00m - 1.00m		Very soft black slightly sandy clayey SILT. Strong sulphurous odour. Sand is fine. [MADE GROUND]				
1.00m - 4.70m		Very soft black slightly sandy silty CLAY locally with rare plastic fragments (<0.1x50x100mm). Slight becoming moderate with depth hydrocarbon odour. Sand is fine. From 2.50m the odour is becoming moderate. Plastic at 3m depth [MADE GROUND]				
4.70m - 5.00m		Firm and stiff brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of limestone, quartzite. [possible TILL]				
5.00m - 5.50m		Firm and stiff grey silty CLAY. [PORT CLAY]				
5.50m - 6.00m		UT - Unopened Tin - Recovered 500mm. Top and bottom - Soft brown, very sandy CLAY.				
5.50m - 6.70m		Oversample. Soft and firm greyish brown slightly gravelly locally very sandy silty CLAY. Sand is fine and medium. Gravel is angular to subrounded fine and medium of limestone, quartzite.				
6.70m - 7.00m		Dense greyish brown very silty SAND. Sand is fine and medium.				

7.00m - 7.50m	Soft and firm slightly gravelly silty CLAY. Gravel is subangular to subrounded fine and medium of limestone, quartzite.
7.50m - 8.00m	UT - Unopened Tin - No recovered. Soft brown slightly sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of limestone, quartzite, psammite. cobbles are subangular and subrounded (<100mm x 100mm x120mm) of limestone.
8.00m - 8.70m	Dark brownish grey clayey very sandy GRAVEL with frequent pockets of stiff brownish grey slightly sandy gravelly clay. Sand is fine to coarse. Gravel is angular and subrounded fine to coarse of limestone, quartzite, and psammite.
8.70m - 12.00m	Very stiff dark grey slightly sandy gravelly CLAY with occasional fine and medium grey sand lenses (<200mm). Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of limestone, psammite, quartzite. [TILL]
12.00m - 14.40m	Very stiff dark grey slightly sandy gravelly CLAY with low cobble content with occasional fine and medium grey sand lenses (<200mm). Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of limestone, psammite, quartzite. Cobbles are (90mmx70m) angular fragments of dark grey limestone. [TILL]
14.40m - 14.60m	Assumed zone of core loss
14.60m - 16.60m	Dark grey slightly sandy clayey GRAVEL with low cobble content with rare seams (<70mm) of firm dark grey sandy gravelly clay. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of limestone, psammite. Cobbles are (140mm x 90mm) dark grey and greenish grey angular to subrounded strong dark grey limestone. Some core loss within these depths [TILL]
16.60m - 18.10m	No recovery
18.10m - 18.85m	Dark grey slightly sandy clayey GRAVEL with low cobble content with occasional pockets (<20mm) of firm dark grey sandy gravelly clay. Sand is fine to coarse. Gravel is angular to subrounded fine and medium of limestone. Cobbles are (110mm x 80mm) angular to subrounded strong dark grey and grey limestone with randomly oriented occasional calcite veins (<5mm). [TILL]
18.85m - 19.60m	No Recovery
19.60m - 28.65m	Micritic LIMESTONE of varying strength and weathering. [LIMESTONE BEDROCK]

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-S-03	718451.307E, 734124.574N	09/11/2022	DG & JL	Yes	S001	F001
Notes: Located approximately 25m south of BH-S-04.						
<ol style="list-style-type: none"> One fragment modern pottery (26mm x 27mm x 3mm) recovered from a depth of between 1.0m and 1.5m. One fragment of clinker (35mm x 30mm x 20mm) recovered from a depth of between 1.0m and 1.5m. Timber fragment recovered from a depth of between 2.5m to 3.5m. 						
Metres from Surface	Description					
0.00m - 1.00m	Very soft and soft black slightly sandy silty CLAY with occasional shells (<40mm x 30mm) and with string sulphurous odour. Sand is fine and medium. [MADE GROUND]					
1.00m - 1.50m	Black very clayey slightly sandy GRAVEL with rare shells (<75mm x 50mm) and strong sulphurous odour. Sand is fine. Gravel is angular and subangular fine and medium of limestone and sandstone. [MADE GROUND]					
1.50m - 1.80m	Soft black silty CLAY with strong sulphurous odour. [MADE GROUND]					
1.80m - 2.50m	Dark grey slightly sandy GRAVEL with frequent pockets of firm brown very sandy clay and with strong hydrocarbon odour. Sand is medium. Gravel is angular to rounded fine to coarse of limestone sandstone calcite and quartz. [MADE GROUND]					
2.50m - 3.00m	Dark grey silty SAND. Sand is fine and medium. [MADE GROUND]					
3.00m - 3.50m	Dark grey sandy GRAVEL with occasional pockets of soft clay (<70mm x 50mm x 40mm) and with 1 No. wood fragment (<95mm x 10mm x 5mm) and with strong hydrocarbon odour. Sand is medium and coarse. Gravel is subangular fine of limestone and sandstone. [ESTUARINE DEPOSITS]					

3.50m - 4.00m	Dark grey silty SAND. Sand is fine and medium predominantly fine. [ESTUARINE DEPOSITS]
4.00m - 4.50m	Dark grey sandy slightly clayey GRAVEL. Sand is medium and coarse. Gravel is subangular fine of limestone and sandstone. [ESTUARINE DEPOSITS]
4.50m - 6.00m	Dark grey very silty SAND with occasional shells (<50mm x 50mm) and shell fragments (<5mm x 2mm), rare wood fragments (<15mm x 10mm x 5mm) and strong sulphurous odour. Sand is fine and medium predominantly fine. [ESTUARINE DEPOSITS]
6.00m - 6.50m	Soft dark grey slightly sandy slightly gravelly CLAY with strong sulphurous odour. Gravel is angular to subrounded fine to coarse of limestone. [ESTUARINE DEPOSITS]
6.50m - 7.50m	Soft brownish grey silty CLAY with strong sulphurous odour. [ESTUARINE DEPOSITS]
7.50m - 8.00m	Firm brownish grey slightly sandy silty CLAY with rare wood fragments (<5mm x 4mm x 1mm) and strong sulphurous odour. Sand is fine. [ESTUARINE DEPOSITS]
8.00m - 8.50m	Firm brownish grey gravelly CLAY with occasional wood fragments (<10mm x 5mm x 2mm) and occasional shell fragments (<10mm x 2mm) with moderate sulphurous odour. Gravel is subangular and subrounded fine to coarse of sandstone and limestone.
8.50m - 9.00m	Medium dense grey slightly sandy GRAVEL. Sand is medium and coarse. Gravel is subangular to rounded fine to coarse of limestone sandstone quartz and calcite. [GLACIAL DEPOSITS]
9.00m - 9.50m	Grey very sandy GRAVEL. Sand is medium and coarse. Gravel is subangular to rounded fine to coarse of limestone sandstone psammite and calcite. [GLACIAL DEPOSITS]
9.50m - 10.00m	Grey slightly clayey slightly sandy GRAVEL. Sand is medium and coarse. Gravel is subangular and subrounded fine and medium of limestone sandstone and calcite. [GLACIAL DEPOSITS]
10.00m - 10.50m	Dark grey sandy very clayey GRAVEL with low cobble content. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are (<160mm x 75mm x 30mm) subangular of limestone. [GLACIAL DEPOSITS]
10.50m - 11.00m	Dark grey clayey sandy GRAVEL. Sand is medium and coarse. Gravel is subangular and subrounded fine to coarse of limestone and sandstone. [GLACIAL DEPOSITS]
11.00m - 11.50m	Dark grey slightly silty gravelly SAND with 1 No. cobble and with rare pockets of sandy clay (<85mm x 60mm x 40mm). Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of limestone sandstone quartz. Cobble is (<100mm x 75mm x 50mm) subrounded of limestone. [GLACIAL DEPOSITS]
11.50m - 12.50m	Dark grey very sandy GRAVEL with frequent pockets of firm brownish grey clay. Sand is medium and coarse. Gravel is subangular to rounded fine to coarse of limestone sandstone and calcite. [GLACIAL DEPOSITS]
12.50m - 13.00m	Dark brown slightly clayey SAND. Sand is medium and coarse. [GLACIAL DEPOSITS]
13.00m - 16.50m	Very stiff dark grey slightly calcareous gravelly sandy CLAY with low cobble content. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of dark grey limestone and siltstone. Cobbles are (<80mm x 90mm x 120mm) of subrounded limestone. [GLACIAL DEPOSITS]
16.50m - 16.80m	Assumed zone of core loss.
16.80m - 17.50m	Dark grey to brownish grey calcareous sandy clayey GRAVEL with low cobble content. Gravel is subangular and subrounded fine to coarse of dark grey limestone, siltstone and subrounded white calcite. Cobbles are (<60mm x 100mm x 120mm) subrounded of dark grey limestone. [GLACIAL DEPOSITS].
17.50m - 18.20m	Assumed zone of core loss.
18.20m - 18.55m	Dark grey and brownish grey slightly clayey GRAVEL. Gravel is subangular to subrounded fine to coarse of dark grey limestone, brownish grey siltstone, and possible schist [GLACIAL DEPOSITS].
18.55m - 19.00m	Dark grey COBBLES with some brownish grey clayey sandy GRAVEL. Gravel is subangular and subrounded medium to coarse of limestone. Cobbles are (<80mm x 90mm x 120mm) of subrounded dark grey limestone with frequent calcite veins (<3mm). [GLACIAL DEPOSITS].
19.00m - 19.70m	Dark grey to brownish grey slightly clayey GRAVEL with low cobbles content. Gravel is subangular and subrounded fine to coarse of dark grey limestone,

	siltstone, white calcite, and greenish grey possible schist. Cobbles are (<50mm x 65mm x 100mm) of subrounded dark grey limestone. [GLACIAL DEPOSITS].
19.70m - 22.75m	Assumed zone of core loss.
22.75m - 23.50m	Strong dark grey to brownish grey LIMESTONE with some brownish grey penetrative staining. Slightly weathered. Non intact recovered as subrounded medium to coarse gravel. [LIMESTONE BEDROCK].
23.50m - 24.20m	Strong dark grey becoming grey with depth LIMESTONE with abundant incipient vertical fractures infilled with calcite
24.20m - 29.10m	Strong and very strong thinly laminated dark grey micritic LIMESTONE.

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH_S_04	718456.649E, 734149.282N	06/11/22	DG & JL	---	S002	---

Notes: Located west of Poolbeg Marina. Some brushwood and roundwood fragments were recovered at a depth of 7.5 to 8m within an amorphous peat. Likely natural.

Metres from Surface	Description
0.00m - 0.50m	Very soft, dark grey, silty CLAY. Strong putrid odour.
0.50m - 0.95m	SPT-Self weight penetration. Very soft, dark grey, silty CLAY. Strong putrid odour.
1.00m - 1.50m	Very soft, dark grey and black, silty CLAY. Strong putrid odour.
1.50m - 2.50m	PS - Push sample. 720mm recovered. Sample in a closed container and cannot be viewed. Very soft, black, silty CLAY. Strong putrid odour.
2.50m - 2.95m	SPT - 400mm. Self-weight penetration. Very soft, black, silty CLAY. Strong putrid odour.
3.00m - 3.50m	Very soft, black, silty CLAY. Strong putrid odour.
3.50m - 4.50m	PS - Push sample. 790mm recovered. Sample in a closed container and cannot be viewed. Very soft, black, silty CLAY. Strong putrid odour.
4.50m - 4.95m	SPT - 350mm. Very soft, black, slightly sandy, silty CLAY. Sand is fine.
5.00m - 5.50m	Very soft, dark grey and brownish grey, slightly sandy CLAY. Sand is fine. Strong putrid odour.
5.50m - 6.00m	UT - Soft, brownish grey CLAY. Strong putrid odour.
6.00m - 6.50m	Soft, brownish grey CLAY. Strong putrid odour.
6.50m - 6.95m	SPT - 450mm. Self-weight penetration. Soft, brownish grey, silty CLAY with shell fragments. Distinct putrid odour.
7.00m - 7.50m	Soft, brownish grey, silty CLAY with putrid odour.
7.50m - 8.00m	UT - Soft, brownish grey, silty CLAY with wood fragments. Fragments of wood are in the form of brushwood. Images taken. Sample of the Brushwood was retained.
8.00m - 8.50m	Firm grey CLAY with occasional wood fragments and occasional pockets of amorphous peat. Putrid odour
8.50m - 8.95m	Spongy brown amorphous peat. Putrid odour
8.50m - 9.00m	Dark grey, slightly sandy GRAVEL with medium cobble content. Sand is coarse. Gravel is angular to rounded, fine to coarse of limestone. Cobble (<130mm x 100mm x 65mm) are subangular to rounded of limestone. SPT over-sample.
9.00m - 9.50m	Dark grey gravelly SAND. Sand is medium to coarse. Gravel is subangular to rounded, fine to coarse of limestone.
9.50m - 9.95m	SPT - 300mm recovery. Dark grey, slightly clayey SAND. Sand is medium to coarse.
10.00m - 10.50m	Firm grey, slight sandy, slightly gravelly CLAY. Sand is medium. Gravel is angular to subrounded, fine to medium of limestone.
10.50m - 10.80m	UT - Dark grey, slightly gravelly CLAY. Gravel is angular, fine to medium of limestone.
10.50m - 11.00m	Bulk sample. Dark grey sandy GRAVEL. Sand is medium and coarse. Gravel is angular and subangular, fine to medium of limestone.
11.00m - 11.50m	Dark grey, gravelly SAND with frequent pockets of clay (<100mm x 70mm x 60mm). Sand is coarse. Gravel is angular to subrounded, fine to medium of limestone.

11.50m - 11.95m	SPT - 300mm recovery. Stiff, grey, sandy CLAY. Sand is fine to coarse
11.50m - 15.00m	Stiff, dark grey, slightly sandy, gravelly CLAY. Sand is fine and coarse. Gravel is angular and subangular, fine to medium of limestone, psammite, and quartzite.
15.00m - 16.00m	Very stiff, dark grey, slightly sandy, gravelly CLAY with low cobble content. Sand is fine and coarse. Gravel is angular and subangular, fine to medium of limestone, psammite, and quartzite. Cobble (<100mm x 100mm x 80mm) angular fragments of dark grey limestone.
16.00m - 16.50m	Dark grey, gravelly SAND with clay pockets (<20mm x 40mm). Sand is fine to coarse. Gravel is subangular to subrounded, fine to medium of limestone, psammite, and quartzite.
16.50m - 16.95m	SPT - Recovery 140mm. Dark grey, slightly sandy, clayey GRAVEL. Sand is medium to coarse. Gravel is subangular to subrounded, fine to medium of limestone and quartzite.
17.00m - 17.50m	Dark grey, sandy GRAVEL with pockets of very stiff, dark grey CLAY and low cobble content. Sand is medium to coarse. Gravel is subangular to subrounded, fine to coarse of limestone. Cobble is (<95mm x 110mm x 50mm) subrounded of limestone.
17.50m - 17.95m	SPT - Recovery 190mm. Stiff, dark grey, slightly sandy, slightly gravelly CLAY. Sand is fine. Gravel is subangular, fine of limestone.
17.50m - 18.00m	Dark grey, sandy GRAVEL with many pockets of stiff, dark grey CLAY and low cobble content. Sand is coarse. Gravel is angular to subrounded, fine to coarse of limestone. Cobble (<130mm x 110mm x 80mm) subangular of limestone.
18.00m - 18.50m	Dark grey, sandy GRAVEL with many pockets (<130mm x 90mm x 60mm) of stiff, dark grey CLAY. Sand is coarse. Gravel is subangular to subrounded, fine to coarse of limestone.
18.50m - 18.72m	SPT - 200mm recovery. Stiff, dark grey, slightly sandy, slightly gravelly CLAY. Sand is medium to coarse. Gravel is angular and fine of limestone
18.72m - 21.00m	No recovery
21.00m - 22.10m	Dark grey, slightly sandy, clayey GRAVEL. Sand is fine to medium. Gravel is subangular to rounded, fine to coarse of limestone, rare psammite, rare quartz, and rare calcite.
22.10m - 23.05m	No Recovery
23.05m - 23.41m	Dark grey, slightly clayey, slightly sandy GRAVEL. Sand is medium. Gravel is subangular to subrounded, medium to coarse of limestone, sandstone and other lithologies.
23.41m - 23.90m	Strong, dark grey LIMESTONE with one calcite vein.
23.90m - 24.25m	Assumed zone of core loss.
24.25m - 25.26m	Strong, dark grey, fine grained LIMESTONE with occasional calcite veins.
25.26m - 26.50m	Medium strong, black, fine-grained LIMESTONE.
26.50m - 27.40m	Strong, dark grey, fine-grained LIMESTONE with many calcite veins.
27.40m - 28.90m	Medium strong and strong, black, fine-grained LIMESTONE.

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH_S_05	718614.620E, 734102.502N	13/11/22	DG & JL	---	---	---
Notes: Located approximately 40m west of Poolbeg Marina. Switch to rotary coring at approximately 17m. Made ground to 6m and bedrock at 26.8m.						
Metres from Surface		Description				
0.00m - 0.50m		Dark grey, slightly clayey, sandy Gravel with rare shell fragments (20mm x 12mm). Sand is fine to medium. Gravel is rounded, medium to coarse of sandstone, limestone, and mudstone. Distinct hydrocarbon odour. [MADE GROUND]				
0.50m - 0.95m		SPT - 250mm recovered. Dark grey, gravelly SAND. Sand is fine. Gravel is subangular and subrounded, fine and medium of limestone and sandstone. Hydrocarbon odour. [MADE GROUND]				
0.50m - 1.00m		Grey and dark grey, sandy GRAVEL with shell fragments (20mm x 20mm). Sand is medium to coarse. Gravel is subrounded and rounded, fine and				

	medium of mix lithologies including limestone, quartz, and sandstone. [MADE GROUND]
1.00m - 1.50m	Grey, gravelly SAND with frequent shells (<45mm x 30mm) and shell fragments (<25mm x 20mm). Sand is fine to medium. Gravel is angular to subrounded, fine and medium of mix lithologies including limestone, quartz, sandstone, and siltstone. [MADE GROUND]
1.50m - 1.95m	Dark grey SAND with frequent shell fragments (<10mm x 6mm). Sand is fine to coarse.
1.50m - 2.00m	Bulk oversample. Grey, slightly silty SAND with shells (<30mm x 20mm) and shell fragments (<20mm x 10mm). Sand is fine to medium. [MADE GROUND]
2.00m - 2.50m	Soft, greyish brown, slightly gravelly, sandy CLAY with some shell fragments (<30mm x 20mm). Sand is fine to medium. Gravel is subangular and subrounded, fine and medium of limestone and sandstone. [MADE GROUND]
2.50m - 3.50m	Push sample. Sealed container that cannot be open onsite. Soft, brown, sandy, clayey SILT. Sand is fine. Putrid odour
2.50m - 3.50m	Bulk oversample. Soft, greyish brown, slightly sandy CLAY with a strong sulphurous odour. [MADE GROUND]
3.50m - 3.95m	SPT - Self weight penetration. 450mm recovered. Soft, grey, slightly sandy, silty CLAY with rare shell fragments (<5mm x 3mm). Sand is fine. Putrid odour of hydrogen sulphide. [MADE GROUND]
4.00m - 4.50m	Soft, grey, slightly sandy, silty CLAY with rare shell fragments. Sand is fine. Putrid odour of hydrogen sulphide. [MADE GROUND]
4.50m - 5.50m	Push sample - 620mm recovered. Sealed container that cannot be open onsite. Soft, grey, slightly sandy, silty CLAY with rare shell fragments. Sand is fine. Putrid odour of hydrogen sulphide. [MADE GROUND]
5.50m - 5.95m	SPT - Self weight - 450mm recovered. Soft, grey, slightly sandy, silty CLAY with rare shell fragments. Sand is fine. Putrid odour of hydrogen sulphide. [MADE GROUND]
6.00m - 6.50m	Soft greyish brown silty CLAY. [ESTUARINE DEPOSITS]
6.50m - 9.00m	Very soft and soft, locally firm, greyish brown slightly calcareous slightly sandy silty CLAY with some shell fragments (<3mm x 50mm). Sand is fine. [ESTUARINE DEPOSITS]
9.00m - 9.50m	Very soft brownish grey gravelly silty CLAY with low cobble content. Gravel is subangular and angular medium to coarse of limestone. Cobbles are (<60mm x 80mm x 110mm) of subangular dark grey limestone. [ESTUARINE DEPOSITS]
9.50m - 11.00m	Dark brown and grey silty sandy GRAVEL with medium to low cobble content, becoming sandy gravelly CLAY with depth. Sand is fine to coarse. Gravel is subangular and subrounded, elongated, fine to coarse of limestone, siltstones, and sandstones. Cobbles are (<30mm x 80mm x 80mm) of limestone [ESTUARINE DEPOSITS]
11.00m - 12.50m	Very stiff and stiff dark brownish grey indistinctly fissured calcareous slightly sandy silty CLAY. Sand is fine to coarse, predominately fine. [POSSIBLE PORT CLAY]
12.50m - 13.00m	Soft and firm gravelly CLAY. Gravel is subangular to subrounded fine to coarse of limestone. [POSSIBLE PORT CLAY]
13.00m - 16.00m	Very stiff dark brown slightly calcareous slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of dark grey limestone. [GLACIAL DEPOSITS]
16.00m - 17.00m	Brown silty gravelly SAND with pockets (<90mm x 50mm x 30mm) of silty clay. Sand is medium and coarse. Gravel is angular to subrounded fine to coarse of limestone. [GLACIAL DEPOSITS]
17.00m - 17.50m	Assumed zone of core loss.
17.50m - 17.90m	Dark brown slightly sandy very clayey GRAVEL. Sand is medium and coarse. Gravel is subangular and subrounded fine to coarse of limestone. [GLACIAL DEPOSITS]
17.90m - 18.50m	Assumed zone of core loss.
18.50m - 18.91m	Dark brown slightly sandy clayey GRAVEL with low cobble content. Sand is medium and coarse. Gravel is subangular and subrounded fine to coarse of limestone. Cobbles are (<90mm x 75mm x 65mm) subangular of limestone. [GLACIAL DEPOSITS]
18.91m - 19.50m	Assumed zone of core loss.
19.50m - 20.00m	Dark brownish grey slightly sandy very clayey GRAVEL with low cobble

	content. Sand is medium and coarse. Gravel is subangular and subrounded fine to coarse of limestone. Cobbles are (<100mm x 75mm x 50mm) subrounded of limestone. [GLACIAL DEPOSITS]
20.00m - 20.50m	Dark brownish grey slightly sandy clayey GRAVEL. Sand is medium and coarse. Gravel is subangular to rounded fine to coarse of limestone. [GLACIAL DEPOSITS]
20.83m - 21.50m	Assumed zone of core loss.
21.50m - 22.00m	Dark brownish grey slightly sandy clayey GRAVEL. Sand is medium and coarse. Gravel is subangular to rounded fine to coarse of limestone. [GLACIAL DEPOSITS]
22.00m - 22.50m	Assumed zone of core loss.
22.50m - 22.90m	Dense dark brownish grey slightly sandy clayey GRAVEL. Sand is medium and coarse. Gravel is subangular to rounded fine to coarse of limestone and sandstone. [GLACIAL DEPOSITS]
22.90m - 23.50m	Assumed zone of core loss.
23.50m - 23.80m	Dense dark brownish grey slightly clayey slightly sandy GRAVEL. Sand is medium. Gravel is angular to subrounded medium and coarse of limestone. [GLACIAL DEPOSITS]
23.80m - 24.50m	Assumed zone of core loss.
24.50m - 24.77m	Dense dark grey slightly clayey slightly sandy GRAVEL. Sand is fine. Gravel is subangular coarse of limestone. [GLACIAL DEPOSITS]
24.77m - 26.00m	Assumed zone of core loss.
26.00m - 26.80m	Very dense dark grey slightly clayey slightly sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of dark grey and grey limestone, brown sandstone, and green schist. Cobbles are (<40mm x 60mm x 140mm) subangular and subrounded of limestone and green schist. [GLACIAL DEPOSITS]
26.80m - 28.10m	Medium strong dark grey thin laminated LIMESTONE with frequent and abundant lenses (<3mm x 20mm) of grey calcite. [LIMESTONE BEDROCK]
28.10m - 29.40m	Strong dark grey mottled grey fossiliferous LIMESTONE with abundant crinoids' fragments. Non intact recovery. [LIMESTONE BEDROCK]

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-S-06	718621.358E, 734133.668N	12/11/2022	DG & JL	---	---	---
Notes:						
Metres from Surface		Description				
0.00m - 3.50m		Very soft black slightly sandy silty CLAY with distinct sulphurous odour. Sand is fine. [Made Ground].				
3.50m - 4.50m		Soft black silty sandy CLAY with frequent plant rootlets (<50mm x 2mm). Sand is fine. [ESTUARINE DEPOSITS]				
4.50m - 5.00m		Soft black silty sandy CLAY with moderate hydrocarbon odour. Sand is fine. [ESTUARINE DEPOSITS]				
5.00m - 5.50m		Soft black silty sandy CLAY with frequent plant rootlets (<50mm x 2mm). Sand is fine. [ESTUARINE DEPOSITS]				
5.50m - 6.50m		Soft black slightly sandy silty CLAY with rare plant rootlets (<50mm x 2mm). Sand is fine. [ESTUARINE DEPOSITS]				
6.50m - 7.00m		Soft black silty sandy CLAY with rare pockets (<30mm x 25mm) of soft brown clay. Sand is fine and medium. [ESTUARINE DEPOSITS]				
7.00m - 8.00m		Dark grey slightly clayey sandy GRAVEL with low cobble content. Sand is medium and coarse. Gravel is angular to subrounded fine to coarse of limestone. Cobbles are (<120mm x 75mm x 30mm) subangular of limestone sandstone and calcite. [GLACIAL DEPOSITS]				
8.00m - 8.50m		Dense grey sandy GRAVEL with medium cobble content. Sand is medium and coarse. Gravel is subangular to rounded fine to coarse of limestone, sandstone, quartz, calcite, and green schist. Cobbles (<110mm x 110mm x 50mm) are subangular and subrounded fine to coarse of limestone and sandstone. [GLACIAL DEPOSITS]				
8.50m - 9.00m		Grey slightly silty sandy GRAVEL. Sand is fine to coarse. Gravel is				

	subangular and subrounded fine and medium of limestone sandstone and calcite. [GLACIAL DEPOSITS]
9.00m - 9.50m	Stiff greyish brown slightly sandy slightly gravelly CLAY. Sand is fine and medium. Gravel is subangular fine of limestone and sandstone. [GLACIAL DEPOSITS]
9.50m - 10.50m	Firm and stiff brown silty CLAY. [GLACIAL DEPOSITS]
10.50m - 12.00m	Firm brown slightly sandy silty CLAY. [GLACIAL DEPOSITS]
12.00m - 13.50m	Firm becoming stiff with depth brown dark brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular and subangular fine and medium of limestone and sandstone. [GLACIAL DEPOSITS]
13.50m - 17.00m	Very stiff dark brown slightly calcareous slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to rounded, locally elongated, fine to coarse of dark grey limestone, brown siltstone/sandstone, and metamorphic rocks possible schist. [GLACIAL DEPOSITS]
17.00m - 17.50m	Dark grey to brownish grey calcareous sandy clayey GRAVEL with low cobble content. Sand is fine to coarse. Gravel is subangular to subrounded of fine to coarse of dark grey limestone and brownish grey siltstone. Cobbles are (<50mm x 80mm x 90mm) subrounded and rounded of dark grey limestone [GLACIAL DEPOSITS].
17.50m - 18.70m	Dark grey COBBLES with some brownish grey clayey GRAVEL. Gravel is subangular to subrounded of medium to coarse of dark grey and grey limestone, brownish grey and brown siltstone, and green schist. Cobbles are (<70mm x 80mm x 120mm) subrounded of dark grey limestone with some calcite veins (<5mm) [GLACIAL DEPOSITS]
18.70m - 19.00m	Assumed zone of core loss.
19.00m - 19.90m	Dark grey to brownish grey calcareous sandy clayey GRAVEL with low cobble content. Sand is fine to coarse. Gravel is subangular to rounded, locally elongated, of fine to coarse of dark grey and grey limestone, brownish grey siltstone, rounded white calcite and metamorphic rocks possible green schist. Cobbles are (<60mm x 90mm x 170mm) subrounded and rounded of very strong and strong dark grey limestone [GLACIAL DEPOSITS].
19.90m - 20.50m	Assumed zone of core loss.
20.50m - 20.93m	Dark grey to brownish grey calcareous sandy clayey GRAVEL. Gravel is subangular to rounded, locally elongated, of fine to coarse of dark grey and grey limestone, brownish grey siltstone, rounded white calcite and metamorphic rocks possible green schist. [GLACIAL DEPOSITS].
20.93m - 22.75m	Assumed zone of core loss.
22.75m - 23.15m	Dark grey to brownish grey slightly calcareous slightly clayey GRAVEL. Gravel is subangular to rounded, locally elongated, of fine to coarse of dark grey and grey limestone, brownish grey siltstone, rounded white calcite and metamorphic rocks possible green schist. [GLACIAL DEPOSITS].
23.15m - 24.25m	Assumed zone of core loss.
24.25m - 25.00m	Dark grey to brownish grey slightly calcareous slightly clayey GRAVEL. Gravel is subangular to rounded of fine to coarse of dark grey and grey limestone, brownish grey siltstone, and metamorphic rocks possible green schist. [GLACIAL DEPOSITS].
25.00m - 25.36m	Very strong and strong dark grey micritic LIMESTONE
25.36m - 28.80m	Strong and very strong, locally medium strong, thinly laminated dark grey micritic LIMESTONE with occasional vertical to subvertical bifurcating calcite veins

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-S-07	718613.188E, 734094.755N	12/02/2023	JL	---	---	---
Notes: Addition to the proposed programme of boreholes						
Metres from Surface		Description				
0.00m - 0.50m		Dark grey, slightly clayey, silty sandy GRAVEL with rare shell fragments. Sand is fine and medium. Gravel is rounded and subrounded, fine to coarse of limestone, siltstone psammite and green schist.				

0.50m - 1.50m	Dense, dark grey, sandy silty Gravel. Sand is fine and medium. Gravel is angular and subangular, fine, and medium of limestone, siltstone, quartz, calcite, and psammite.
1.50m - 2.50m	Dense, grey, slightly gravelly, slightly silty SAND with frequent shell fragments. Sand is fine and medium. Gravel is rounded and subrounded, fine of limestone.
2.50m - 5.50m	Very soft, brownish grey, sandy, silty CLAY. Sand is fine.
5.50m - 8.50m	Very soft, grey, silty CLAY
8.50m - 10.00m	Very dense, grey, and dark grey, sandy, silty GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of limestone, siltstone, and psammite.
10.00m - 15.80m	Very dense, grey, and dark grey, sandy, silty GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of limestone, siltstone, and psammite.

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-S-08	718532.526E, 734104.422N	16/02/2023	JL	---	---	---
Notes: Addition to the proposed programme of boreholes						
Metres from Surface		Description				
0.00m - 0.50m		Loose, very dark grey to grey, silty gravelly SAND with medium strong, sulphurous odour. Sand is fine. Gravel is angular to subrounded, fine to coarse of LIMESTONE.				
0.50m - 6.50m		Loose, becoming medium dense, dark grey and grey, silty SAND with occasional shell fragments. Sand is fine and medium, predominantly fine.				
6.50m - 8.00m		Very soft, slightly silty CLAY. Sand is fine.				
8.00m - 11.20m		Medium dense and dense, grey, sandy GRAVEL. Sand is fine to coarse, predominantly medium, and coarse. GRAVEL is subangular to rounded, fine to coarse of mixed lithologies including limestone, siltstone, sandstone, and green schist.				
11.20m - 12.00m		Very stiff, grey slightly sandy, gravelly silty CLAY. Sand is medium and coarse. Gravel is subangular and subrounded, fine to coarse of siltstone, limestone, and sandstone.				
12.00m - 15.80m		Very stiff, dark grey, slightly sandy, gravelly, silty CLAY. Sand is fine to coarse of mixed lithologies including limestone, siltstone, sandstone, and green schist.				

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-S-09	718351.722E, 734141.116N	17/02/23	JL	---	---	---
Notes: Addition to the proposed programme of boreholes						
Metres from Surface		Description				
0.00m - 0.50m		Dark grey and grey, slightly sandy, gravelly, silty CLAY with shell fragments. Sand is fine. Gravel is angular, fine to coarse of limestone.				
0.50m - 1.60m		Loose dark grey and grey, clayey, sandy, and very sandy GRAVEL with shell and shell fragments with a low cobble content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of limestone.				
1.60m - 7.40m		Very soft, grey, slightly sandy, silty CLAY with rare shell fragments. Sand is fine.				
7.40m - 8.66m		Dense and very dense, grey sandy GRAVEL. Gravel is fine and medium. Gravel is subangular to rounded, fine to coarse of mixed lithologies including limestone, sandstone, siltstone, and green schist.				
8.66m - 8.75m		Very dense, grey, sandy, silty, clayey GRAVEL with low cobble content. Sand is fine to medium.				

8.75m - 11.90m	Very stiff, brownish grey, sandy, gravelly, silty CLAY. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse. Gravel is angular to subrounded, fine to coarse of mixed lithologies including limestone, siltstone, and sandstone.
11.90m - 12.10m	Brownish grey, slightly clayey, sandy, silty GRAVEL. Sand is fine to coarse. Gravel is subangular to rounded fine to medium of limestone, siltstone, and sandstone.
12.10m - 15.40m	Very stiff, brownish grey, sandy, gravelly silty CLAY. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of limestone, siltstone, and sandstone.

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-K-01	718884.971E, 734119.836N	06/02/2023	JL	---	S005	---

Notes: Small fragment of timber measuring 36mm x 15mm x 8mm.

Metres from Surface	Description
0.00m - 1.50m	Very soft, black, sandy, silty CLAY with slight sulphurous odour. Sand is fine
1.50m - 2.00m	Soft, dark grey and brown, slightly sandy, gravelly CLAY. Sand is fine and medium. Gravel is subangular and subrounded, fine and medium of limestone.
2.00m - 3.00m	Dense grey sandy GRAVEL with a high cobble content. Sand is coarse. Gravel is angular to rounded, fine to coarse of limestone, sandstone, siltstone, quartz, and green schist.
3.00m - 3.50m	Firm, grey, gravelly, very sandy CLAY. Sand is fine and medium.
3.50m - 4.50m	Soft and firm, brownish grey, slightly sandy, silty CLAY. Sand is fine and medium.
4.50m - 6.00m	Firm, brownish grey, slightly sandy, silty CLAY. Sand is fine.
6.50m - 9.00m	Firm, slightly sandy, silty CLAY. Sand is fine. [Port Clay]
9.00m - 10.00m	Soft and firm, brownish grey, slightly sandy, slightly gravelly, silty CLAY. Sand is fine. Gravel is subangular and subrounded, fine to coarse of limestone.
10.00m - 11.00m	Firm, becoming stiff, brownish grey to grey, silty CLAY.
11.00m - 12.80m	Very dense, dark grey to grey, slightly sandy, clayey GRAVEL. Sand is fine to medium. Gravel is angular to subrounded, fine to coarse of limestone.
12.80m - 19.00m	Very stiff, dark grey, slightly sandy to sandy, gravelly CLAY. Sand is fine to medium. Gravel is angular to subrounded, fine to coarse of limestone.
19.00m - 22.75m	Very stiff, brownish grey, sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of limestone, sandstone, and granite.
22.75m - 23.60m	Very stiff, brownish grey, sandy, gravelly CLAY with medium cobble content. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of limestone, sandstone, granite, and green schist.
23.60m - 25.20m	Medium strong, very thinly bedded and thinly bedded, dark grey and grey, fine, and medium grained limestone.
25.20m - 26.76m	Moderately weak and medium strong, dark grey, fine grained mudstone with calcite veins.
26.76m - 35.50m	Medium strong and strong, light grey, coarse grained limestone with calcite veins.

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-K-02	719415.789E, 734056.124N	09/02/23	JL	---	---	---
Notes:						
Metres from Surface		Description				
0.00m - 3.50m		Very soft, dark grey, silty CLAY with medium strong sulphurous odour.				
3.50m - 6.50m		Dense, dark grey and grey, sandy GRAVEL. Sand is fine to medium. Gravel is subangular to rounded, fine to coarse of mixed lithologies including limestone, sandstone, siltstone, and green schist.				
6.50m - 7.50m		Dense, brownish grey, slightly silty SAND. Sand is fine. Gravel is subrounded, fine and medium of mixed lithologies including siltstone, limestone, and psammite.				
7.50m - 10.00m		Dense and very dense, brownish grey, slightly silty SAND. Sand is fine to medium.				
10.00m - 29.00m		Firm and stiff, brownish grey and grey fissured, slightly sandy silty CLAY. Sand is fine. [Port Clay]				
29.00m - 33.85m		Stiff, dark grey and grey, silty, sandy, gravelly CLAY. Sand is fine and medium. Gravel is subangular and rounded, fine to coarse of mixed lithologies including limestone, quartzite, siltstone, and green schist.				
33.85m - 36.90m		Dark grey to grey, slightly clayey, silty, sandy GRAVEL. Sand is fine. Gravel is angular to rounded, fine to coarse of mixed lithologies including limestone, siltstone, and green schist.				
36.90m - 38.60m		Very weak and weak, dark grey and brownish grey, micritic LIMESTONE.				
38.60m - 40.30m		Weak and moderately weak, grey micritic LIMESTONE.				

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-TC-01	720242.268E, 733909.680N	25/11/2022	DG & JL	---	S004	---
Notes: Located west of gas terminal jetty and approximately 50m from Pigeon House Harbour. Bone fragment within the first 500mm of spoil. Concretion (30 x 20 x 15mm) fragment at a depth of 1.0m to 1.5m.						
Metres from Surface		Description				
0.00m - 0.50m		Very soft, black, silty, sandy CLAY with rare bone fragments (< 72mm x 10mm x 8mm) and with strong sulphurous odour. Sand is fine.				
0.50m - 1.50m		Very soft, dark grey, silty, sandy CLAY with strong sulphurous odour and rare shells (<70mm x 40mm) and with one fragment of concretion (< 30mm x 20mm x 15mm). Sand is fine and medium. Sand is fine.				
1.50m - 2.50m		Very loose, dark grey, silty, very sandy CLAY with distinct sulphurous odour. Sand is fine and medium.				
2.50m - 3.00m		Black very clayey slightly silty sandy GRAVEL with low cobble content. Sand is medium and coarse. Gravel is angular to subrounded fine to coarse of limestone and sandstone. Cobbles are (<110mm x 75mm x 60mm) subrounded of limestone. [ESTUARINE DEPOSITS]				
3.00m - 3.50m		Dark grey, silty, very sandy GRAVEL with low cobble content and one oyster shell (<110mm x 90mm). Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of limestone sandstone siltstone, meta basalt and one nodular flint (<50mm x 40mm x 30mm). Cobbles are (<130mm x 90mm x 30mm) subrounded of limestone.				
3.50m - 4.00m		Light grey slightly sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded find to coarse of limestone psammite schist. Cobbles are (130mm x 70mm x 60mm) subangular and subrounded of limestone and psammite.				
4.00m - 4.50m		Dark grey sandy GRAVEL with low cobble content. Sand is medium and coarse. Gravel is angular to subrounded fine to coarse of mixed lithologies including limestone sandstone and green schist. Cobbles are (<130mm x				

	75mm x 70mm) subrounded and rounded of limestone.
4.50m - 5.50m	Medium dense grey very sandy GRAVEL. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of mixed lithologies including limestone sandstone siltstone calcite and granite.
5.50m - 8.00m	Firm and stiff, dark brown, calcareous indistinctly fissured slightly sandy silty CLAY [PORT CLAY]
8.00m - 9.00m	Medium dense dark brown gravelly SAND with frequent shell fragments (<8mm x 5mm). Sand is fine to coarse. Gravel is angular to rounded fine to coarse of mixed lithologies including limestone sandstone and green schist.
9.00m - 12.00m	Dark brown and brown sandy, locally silty, GRAVEL with low and medium cobble content. Sand is coarse. Gravel is subangular and subrounded fine to coarse of limestone, siltstone, psammites rounded white quartz, and green schist. Cobbles are (<50mm x 90mm x 100mm) subrounded, elongated, of limestone and psammites.
12.00m - 12.50m	Dark brown very gravelly SAND with low cobble content. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of limestone and rounded white quartz. Cobbles are (<40mm x 60mm x 80mm) subrounded elongated of limestone and siltstone.
12.50m - 13.00m	Dark brown slightly gravelly slightly calcareous silty SAND. Sand is fine. Gravel is subrounded fine of limestone.
13.00m - 14.00m	Dark brown silty fine SAND.
14.00m - 15.50m	Stiff dark brownish grey indistinctly fissured slightly calcareous CLAY. [PORT CLAY].
15.50m - 17.50m	Strong and medium strong dark grey and grey micritic LIMESTONE with some extremely closely spaced calcite veins. Some non-intact recovery. Some non-intact recovered as light brown and brown angular and subangular fine to coarse clayey gravel of weak limestone. Highly weathered. [LIMESTONE BEDROCK]
17.50m - 24.50m	Soft and firm dark grey locally slightly sandy, slightly calcareous, indistinctly fissured silty CLAY. Sand is fine.
24.50m - 28.50m	Firm brown CLAY.
28.50m - 29.00m	Brownish grey slightly clayey slightly gravelly SAND with pockets of (<70mm x 60mm x 60mm) stiff brownish grey gravelly clay. Sand is medium and coarse. Gravel is angular and subangular fine of limestone.
29.00m - 29.50m	Very stiff dark grey slightly sandy gravelly CLAY. Sand is medium. Gravel is subangular and subrounded fine to coarse, predominantly fine of limestone and sandstone.
29.50m - 30.70m	Very stiff dark brownish grey slightly sandy gravelly CLAY. Sand is fine. Gravel is angular and subangular fine of limestone. [GLACIAL DEPOSITS]
30.70m - 31.45m	Assumed zone of core loss.
31.45m - 31.90m	Dark grey and dark brownish grey sandy clayey GRAVEL with low cobble content. Sand is fine to coarse. Gravel is subangular and subrounded of limestone and psammites. Cobbles are (<50mm x 70mm x 100mm) of strong and very strong dark grey micritic limestone. Fresh. [GLACIAL DEPOSITS]
31.90m - 32.35m	Assumed zone of core loss.
32.35m - 32.75m	Strong dark grey micritic LIMESTONE with some calcite veins. [LIMESTONE BEDROCK]
32.75m - 33.23m	Dark grey and dark brownish grey, sandy, clayey GRAVEL. Sand is fine to coarse. Gravel is subangular and subrounded of limestone. [LIMESTONE BEDROCK]
33.23m - 33.70m	Strong dark grey micritic LIMESTONE with some vertical calcite veins. [LIMESTONE BEDROCK]
33.70m - 39.20m	Limestone of varying degrees of strength and inclusions. Two thin bands (600mm and 400mm) of gravelly sandy Clay at 34.80m and 36.30m [LIMESTONE BEDROCK].

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-TC-02	720241.663E, 733878.318N	17/11.2022	DG&JL	---	---	---
Notes: Borehole is located within what was once called Salmon Pool as seen in 'A map of the Bay and Harbour of Dublin' 1685. Salmon Pool is within Cock Lake.						
Metres from Surface		Description				
0.00m - 3.00m		Very soft black slightly calcareous, slightly micaceous, gravelly silty CLAY with distinct hydrocarbon odour. Gravel is subrounded and rounded fine and medium of limestone. [MADE GROUND]				
3.00m - 3.50m		Black slightly clayey GRAVEL with low cobble content. Gravel is subangular and subrounded fine to coarse of limestone. Cobbles (<50mm x 80mm x 120mm) are subrounded tabular of limestone and siltstone. [ESTUARINE DEPOSITS]				
3.50m - 4.50m		Dark grey and grey slightly silty gravelly SAND with frequent shell fragments (< 2mm x 10mm). Sand is fine to coarse. Gravel is subrounded and rounded fine to coarse of limestone, rounded fine to coarse of white quartz, siltstone, and psammite. [ESTUARINE DEPOSITS]				
4.50m - 8.00m		Brownish grey and brown slightly calcareous micaceous slightly silty slightly gravelly SAND with abundant shell fragments (< 5mm) and frequent gastropods shells (< 30mm). Sand is fine and medium well sorted. Gravel is subangular and subrounded fine of limestone. [ESTUARINE DEPOSITS]				
8.00m - 11.00m		Brownish grey and grey slightly sandy GRAVEL with abundant shell fragments (< 5mm). Sand is fine to coarse. Gravel is subrounded and rounded fine to coarse of limestone, siltstone, psammites, and green schist. [ESTUARINE DEPOSITS]				
11.00m - 12.00m		Brown and grey slightly sandy GRAVEL. Sand is coarse. Gravel is subangular to rounded fine to coarse of mixed lithologies including limestone, sandstone, schist, greenschist, Meta basalt and quartz. [ESTUARINE DEPOSITS]				
12.00m - 14.00m		Grey silty SAND with occasional shell fragments (<5 mm) and rare pockets of soft dark greyish brown clay (< 30mm x 20mm). Sand is fine and medium. [ESTUARINE DEPOSITS]				
14.00m - 15.00m		Very soft brownish grey slightly sandy silty CLAY. Sand is fine. [ESTUARINE DEPOSITS]				
15.00m - 16.00m		Firm and stiff dark greyish brown silty CLAY. Sand is fine. [ESTUARINE DEPOSITS]				
16.00m - 16.50m		Dark grey silty SAND. Sand is fine and medium predominantly fine. [ESTUARINE DEPOSITS]				
16.50m - 17.00m		Grey slightly clayey silty SAND. Sand is fine. [ESTUARINE DEPOSITS]				
17.00m - 17.50m		Firm greyish brown slightly sandy silty CLAY. Sand is fine. [PORT CLAY].				
17.50m - 19.00m		Stiff greyish brown slightly sandy silty CLAY. Sand is fine. [PORT CLAY].				
19.00m - 19.50m		Stiff dark greyish brown indistinctly fissured silty CLAY. [PORT CLAY].				
19.50m - 20.50m		Stiff dark greyish brown CLAY. [PORT CLAY].				
20.50m - 21.00m		Firm dark greyish brown silty CLAY. [PORT CLAY].				
21.00m - 28.00m		Firm dark greyish brown indistinctly fissured, locally fissured calcareous CLAY. [PORT CLAY].				
28.00m - 28.50m		Stiff becoming very stiff dark brownish grey calcareous CLAY gravelly sandy calcareous CLAY with low cobble content. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of limestone and siltstone. Cobbles (< 80mm x 70mm x 30mm) are subrounded fine to coarse tabular of limestone. [GLACIAL DEPOSITS].				
28.50m - 28.9m		Assumed zone of core loss.				
28.95m - 29.50m		Very stiff dark brownish grey slightly calcareous gravelly sandy CLAY. Sand is fine to coarse. Gravel is subrounded and rounded fine to coarse of limestone, brown siltstone, and green schist [GLACIAL DEPOSITS]				
29.50m - 32.00m		No recovery				
32.00m - 32.38m		Dark grey and grey GRAVEL with low cobble content. Gravel is subangular and subrounded fine to coarse of dark grey limestone, psammites, and green schist. Cobbles are (<50mm x 80mm x 100mm) of subrounded dark grey				

	limestone with calcite veins (<5mm) [GLACIAL DEPOSITS]
32.38m - 35.00m	Limestone of varying degrees of strength. [LIMESTONE BEDROCK].
35.00m - 40.00m	Strong, grey, micritic Limestone with occasional inclusions of calcite veins. [LIMESTONE BEDROCK].

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-TC-03	720241.690E, 733863.475N	20/11/2023	JL	---	---	---
Notes:						
Metres from Surface		Description				
0.00m - 0.50m		Very soft black silty very sandy CLAY. Sand is fine and medium. Distinct putrid odour. [ESTUARINE DEPOSITS]				
0.50m - 1.00m		Dark grey very sandy GRAVEL with low cobble content and moderate hydrocarbon odour. Sand is medium and coarse. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are (<140mm x 80mm x 40mm) rounded of limestone. [ESTUARINE DEPOSITS]				
1.00m - 1.50m		Dark grey slightly sandy GRAVEL with low cobble content. Sand is coarse. Gravel is subangular to rounded fine and medium of limestone. Cobbles are (<110mm x 80mm x 55mm) rounded of limestone. [ESTUARINE DEPOSITS]				
1.50m - 5.00m		Dark grey very sandy becoming sandy GRAVEL with low cobble content. Sand is medium and coarse. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are (<120mm x 110mm x 100mm) rounded of limestone and siltstone. [ESTUARINE DEPOSITS]				
5.00m - 8.00m		Brown and brownish grey calcareous, slightly micaceous, slightly gravelly SAND with some a frequent shell fragment (<3mm x 5mm). Sand is fine to medium. Gravel is subrounded fine of limestone. [ESTUARINE DEPOSITS]				
8.00m - 11.00m		Brownish grey locally slightly silty, sandy GRAVEL with some shell fragments (<5mm). Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of limestone, siltstone, psammites, and green schist. [ESTUARINE DEPOSITS]				
11.00m - 13.00m		Dark brownish grey slightly calcareous gravelly SAND. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of limestone, siltstone, psammites and rounded white quartz [ESTUARINE DEPOSITS]				
13.00m - 16.00m		Dark brownish grey slightly calcareous slightly clayey and clayey silty SAND. Sand is fine. [ESTUARINE DEPOSITS]				
16.00m - 16.50m		Brownish grey very silty SAND. Sand is fine and medium. [PORT CLAY]				
16.50m - 17.00m		Stiff dark grey indistinctly fissured silty CLAY. [PORT CLAY]				
17.00m - 17.50m		Dark greyish brown clayey silty SAND with pockets of (<100mm x 90mm x 80mm) dark greyish brown stiff silty clay. Sand is fine and medium predominantly fine. [PORT CLAY]				
17.50m - 18.00m		Firm brownish grey slightly sandy silty CLAY. Sand is fine. [PORT CLAY]				
18.00m - 20.00m		Stiff dark brownish grey sandy silty CLAY. Sand is fine. [PORT CLAY]				
20.00m - 20.50m		Stiff dark brownish grey silty CLAY. [PORT CLAY]				
20.50m - 23.00m		Stiff dark brownish grey indistinctly fissured slightly calcareous CLAY. [PORT CLAY].				
23.00m - 27.00m		Stiff dark brownish grey indistinctly fissured, locally fissured, slightly calcareous silty CLAY. [PORT CLAY].				
27.00m - 27.50m		Stiff dark brownish grey indistinctly fissured slightly calcareous slightly sandy silty CLAY. Sand is fine. [PORT CLAY].				
27.50m - 28.00m		is fine to coarse. Gravel is subangular and subrounded fine to medium of limestone. [POSSIBLE GLACIAL DEPOSITS]				
28.00m - 29.00m		Dark grey and grey sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of limestone and psammites. Cobbles are (<50mm x 70mm x 80mm) subrounded of limestone. [GLACIAL DEPOSITS]				
29.00m - 30.50m		Very stiff dark brownish grey gravelly sandy CLAY with low cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of limestone, siltstone, and green schist. Cobbles are (<50mm x 80mm x 100mm) subrounded of limestone. [GLACIAL DEPOSITS].				
30.50m - 31.50m		Dark grey and grey silty sandy GRAVEL. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of limestone, siltstone, and green schist.				
31.50m - 32.50m		Dark grey slightly sandy GRAVEL. Sand is coarse. Gravel is angular and				

	subangular fine and medium of limestone. Gravel is subangular to rounded coarse of limestone.
32.50m - 33.19m	Dark grey clayey GRAVEL with rare pockets of stiff dark grey slightly gravelly silty clay and with low cobble content. Gravel is subangular and subrounded medium and coarse of limestone. Cobbles are (<95mm x 90mm x 65mm) subangular and subrounded of limestone with clay smear. [GLACIAL DEPOSITS]
33.50m - 39.50m	Grey micritic LIMESTONE of varying strength, inclusions, weathering, and fractures. Core loss 35.65m to 36.00m. [LIMESTONE BEDROCK]

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-TC-04	720090.229E, 733958.046N	27/11/2022	DG & JL	---	---	---
Notes:						
Metres from Surface		Description				
0.00m - 3.50m		Very soft, black, silty becoming slightly sandy CLAY with strong sulphurous odour. Sand is fine. [ESTUARINE DEPOSITS]				
3.50m - 5.00m		Very soft, black, sandy, silty CLAY with strong hydrocarbon odour. Sand is fine. [ESTUARINE DEPOSITS]				
5.00m - 6.00m		Brownish grey, slightly clayey, locally very clayey slightly sandy GRAVEL with slight hydrocarbon odour. Sand is medium and coarse Gravel is subangular to rounded fine to coarse predominantly fine and medium of limestone and sandstone. [ESTUARINE DEPOSITS]				
6.00m - 6.50m		Black very clayey slightly silty sandy GRAVEL with low cobble content. Sand is medium and coarse. Gravel is angular to subrounded fine to coarse of limestone and sandstone. Cobbles are (<110mm x 75mm x 60mm) subrounded of limestone. [ESTUARINE DEPOSITS]				
6.50m - 10.50m		Dark grey and brown, slightly sandy, locally slightly silty, GRAVEL with low and medium cobble content. Sand is coarse. Gravel is angular to rounded, elongated, fine to coarse of limestone and sandstone. Cobbles are (<130mm x 90mm x 80mm) subrounded of limestone and green schist. [ESTUARINE DEPOSITS]				
10.50m - 11.00m		Dark brown, gravelly, silty SAND becoming silty CLAY with depth. Sand is fine to coarse. Gravel is subrounded and rounded fine to coarse of limestone and siltstone. [ESTUARINE DEPOSITS]				
11.00m - 14.00m		Dark brown, clayey, silty SAND. Sand is fine and medium. [ESTUARINE DEPOSITS]				
14.00m - 18.50m		Firm and stiff, dark brown, calcareous fissured silty CLAY. Fissures are horizontal and extremely closely spaced. [PORT CLAY]				
18.50m - 20.00m		Firm and stiff, dark brown, calcareous indistinctly fissured slightly sandy silty CLAY [PORT CLAY]				
20.00m - 27.50m		Stiff dark brown, calcareous fissured silty CLAY. Fissures are horizontal and extremely closely spaced. [PORT CLAY]				
27.50m - 28.50m		Firm brown sandy slightly gravelly CLAY. Sand is fine. Gravel is angular to subrounded fine and medium of sandstone siltstone and limestone. [GLACIAL DEPOSITS]				
28.50m - 29.90m		Dark grey sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of limestone. Cobles (< 110mm x 80mm x 40mm) are subangular and subrounded of limestone. [GLACIAL DEPOSITS]				
Switch to Rotary Coring						
29.90m - 30.45m		Medium strong dark grey micritic LIMESTONE with inclined closely spaced calcite veins (< 3mm). Slightly weathered. [LIMESTONE BEDROCK]				
30.45m - 30.80m		No recovery.				
30.80m - 36.80m		Grey micritic LIMESTONE of varying degrees of strength and inclusions. Some zones of core loss [LIMESTONE BEDROCK].				

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-TC-05	720183.740E, 733945.705N	16/11/2022	DG&JL	---	---	---
Notes: Borehole close to waste ground at Poolbeg Harbour.						
Metres from Surface		Description				
0.00m - 3.00m		Very soft, black, slightly gravelly, becoming silty with depth, CLAY with high hydrocarbon odour.				
3.00m - 5.50m		Dark grey and brownish grey, slightly clayey, sandy GRAVEL with low and medium cobble content, slight to strong hydrocarbon odour. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of limestone, siltstone, psammites, and green schist. Cobbles are (<70mm x 70mm x 90mm) of subrounded and rounded limestone, green schist, and possible psammites.				
5.50m - 6.00m		Brown and brownish grey slightly calcareous gravelly silty SAND with some shell fragments (<2mm x 5mm). Sand is fine to coarse. Gravel is subrounded and rounded of limestone, siltstone and rounded white quartz.				
6.00m - 7.50m		Brown calcareous silty SAND with frequent shell fragments (<2mm). Sand is fine to medium				
7.50m - 8.00m		Brown calcareous slightly gravelly silty SAND with some shell fragments (<3mm). Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of limestone.				
8.00m - 14.00m		Brownish grey, calcareous sandy, locally silty GRAVEL with some shell fragments (<5mm) and low to medium cobble content. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of limestone, siltstone, green schist, and possible psammites. Cobbles are (<70mm x 80mm x 90mm) subrounded of limestone, siltstone and green schist.				
14.00m - 14.50m		Firm brownish grey, slightly calcareous, sandy, silty CLAY.				
14.50m - 15.50m		Brownish grey, calcareous silty SAND with locally frequent shell fragments (<2mm). Sand is fine and medium.				
15.50m - 16.00m		Dark grey very silty SAND. Sand is fine.				
16.00m - 19.50m		Firm, dark greyish brown, sandy silty CLAY. Sand is fine.				
19.50m - 20.50m		Firm dark grey slightly sandy silty CLAY with rare lenses of medium sand. Sand is fine.				
20.50m - 22.50m		Firm, dark greyish brown, silty CLAY.				
22.50m - 23.00m		Firm, dark brown, silty, sandy CLAY with moderate hydrocarbon odour. Sand is fine.				
23.00m - 24.00m		Stiff, greyish brown, slightly sandy, silty CLAY. Sand is fine.				
24.00m - 24.50m		Firm, dark greyish brown, silty CLAY.				
24.50m - 34.00m		Soft and firm, locally stiff dark greyish brown, calcareous, slightly micaceous, indistinctly fissured, locally sandy, silty CLAY.				
34.00m - 34.40m		Dark grey GRAVEL. Gravel is subangular and subrounded fine to coarse of limestone and green schist.				
34.40m - 34.78m		Dark grey, grey, and greenish grey COBBLES some brownish grey silty CLAY. Cobbles are (<70mm x 100mm x 110mm) subangular and subrounded of dark grey micritic limestone, grey fossiliferous limestone, and green schist.				
34.78m - 35.86m		Medium strong dark grey fossiliferous LIMESTONE with abundant shell fragments.				
35.86m - 37.10m		Moderately weak to medium strong mottled brownish grey fossiliferous LIMESTONE with abundant shell fragments.				
37.10m - 40.10m		Strong grey thickly laminated LIMESTONE with medium spaced locally very closely and extremely closely spaced calcite veins.				

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-TC-06	720414.864E 733947.441N	29/11/2022	DG & JL	---	---	---
Notes: North of the entrance of Pigeon House Harbour						
Metres from Surface		Description				
0.00m - 2.00m		Very soft dark brownish grey slightly sandy silty CLAY. Sand is fine. Distinct putrid odour. [ESTUARINE DEPOSITS]				
2.00m - 4.00m		Dark grey and brown slightly clayey sandy GRAVEL with medium cobble content. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of limestone sandstone siltstone. Cobbles (< 140mm x 80mm x 60mm) are subrounded and rounded of limestone. [ESTUARINE DEPOSITS]				
7.00m - 8.50m		Dark grey clayey gravelly SAND. Sand is fine to coarse, gravel is subangular and subrounded fine of limestone. [ESTUARINE DEPOSITS]				
8.50m - 11.50m		Very dense dark grey and brown sandy GRAVEL. Sand is medium and coarse. Gravel is angular to rounded fine to coarse of mixed lithologies including sandstone limestone siltstone and green schist. [ESTUARINE DEPOSITS]				
11.50m - 12.00m		Brown gravelly SAND. Sand is fine to coarse predominately fine and medium. Gravel is angular to subrounded fine to coarse of limestone siltstone and psammite. [ESTUARINE DEPOSITS]				
12.00m - 14.50m		Dense and very dense dark grey and brown SAND with abundant shell fragments (<0.1mm). Sand is fine and medium predominately fine. [ESTUARINE DEPOSITS]				
14.50m - 15.50m		Firm dark grey indistinctly fissured sandy silty CLAY. Sand is fine and medium. [PORT CLAY]				
15.50m - 16.00m		Stiff dark grey indistinctly fissured silty CLAY. [PORT CLAY]				
16.00m - 16.50m		Dark grey slightly silty SAND. Sand is fine and medium.				
16.50m - 17.00m		Firm dark grey silty CLAY. [PORT CLAY]				
17.00m - 17.35m		Dark brownish grey silty SAND. Sand is fine and medium predominately fine.				
17.35m - 19.50m		Firm dark brownish grey fissured silty CLAY. [PORT CLAY]				
19.50m - 26.00m		Stiff dark brownish grey fissured silty CLAY. [PORT CLAY]				
26.00m - 26.50m		Dark greyish brown clayey silty SAND. Sand is fine and medium predominately fine. [PORT CLAY]				
26.50m - 30.00m		Soft and firm sandy silty CLAY. Sand is fine and medium. [PORT CLAY]				
30.00m - 31.50m		Stiff brownish grey silty CLAY with frequent fissures. [PORT CLAY]				
31.50m - 32.00m		Stiff gravelly silty CLAY. Gravel is angular coarse of sandstone. [GLACIAL DEPOSITS]				
32.00m - 33.50m		Stiff dark brown slightly sandy silty CLAY sand is fine to coarse predominantly fine. [GLACIAL DEPOSITS]				
33.50m - 34.00m		Stiff dark brown slightly sandy gravelly silty CLAY. Sand is fine to coarse. Gravel is angular fine of limestone. [GLACIAL DEPOSITS]				
34.00m - 34.45m		Dark brown clayey SAND. Sand is fine to coarse. [GLACIAL DEPOSITS]				
34.45m - 35.00m		Dark grey slightly clayey slightly sandy GRAVEL. Sand is fine to coarse. Gravel is subangular fine to coarse of limestone. Cobbles (< 100mm x 70mm x 60mm) are subangular to rounded of limestone. [GLACIAL DEPOSITS]				
35.00m - 35.40m		Dark grey slightly silty sandy GRAVEL. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of limestone.				
35.40m - 38.30m		Dark grey and grey slightly silty slightly clayey GRAVEL with low and medium cobble content with some subvertical calcite veins (<5mm). Gravel is subangular and subrounded medium and coarse of limestone and psammite. Cobbles are (180mm x 100mm x 90mm) are angular to subrounded strong and very strong dark grey micritic limestone. [GLACIAL DEPOSITS]				
38.30m - 40.05m		Medium strong grey micritic LIMESTONE with some extremely closely spaced calcite veins. [LIMESTONE BEDROCK]				
40.05m - 43.80m		Medium strong and strong dark grey micritic LIMESTONE with some very closely spaced to medium spaced calcite veins. [LIMESTONE BEDROCK]				

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-TC-07	720399.197E, 733899.083N	02/12/2022	JL	---	---	---
Notes: Borehole is located approximately 50m from Pidgeon House Harbour wall and 70m from the entrance to the harbour.						
Metres from Surface		Description				
0.00m - 0.50m		Black, silty SAND with frequent shell fragments (<2mm x 1mm). Sand is fine and medium. Distinct putrid odour. [MADE GROUND]				
0.50m - 3.50m		Soft black sandy to very sandy silty CLAY, with rare slag (6mm x 4mm x3mm) and occasional shell fragments (<1mm x 1mm) sand is fine and medium. [MADE GROUND]				
3.50m - 4.00m		Soft black sandy slightly gravelly CLAY. Sand is fine and medium. Gravel is angular and subrounded fine and medium of sandstone and limestone. [ESTUARINE DEPOSITS]				
4.00m - 7.00m		Light grey slightly sandy GRAVEL with some cobbles (110 x 80 x 50mm). Sand is fine to coarse, gravel is subangular to rounded fine to coarse of limestone, green schist, and rare granite. [ESTUARINE DEPOSITS]				
7.00m - 11.00m		Dark grey to dark brown gravelly SAND. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of mixed lithologies including limestone sandstone and green schist. [ESTUARINE DEPOSITS]				
11.00m - 11.50m		Light grey slightly sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of limestone psammite schist. Cobbles are (130mm x 70mm x 60mm) subangular and subrounded of limestone and psammite.				
11.50m - 12.50m		Dark brownish grey slightly silty gravelly SAND. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of mixed lithologies including limestone psammite and siltstone. [ESTUARINE DEPOSITS]				
12.50m - 15.00m		Very dense dark brownish grey slightly silty SAND. Sand is fine to coarse predominately fine and medium [ESTUARINE DEPOSITS]				
15.00m - 17.00m		Firm dark brownish grey fissured silty CLAY. [PORT CLAY]				
17.00m - 18.40m		Stiff dark brownish grey fissured silty CLAY. [PORT CLAY]				
18.40m - 21.00m		Stiff dark brownish grey fissured sandy silty CLAY. Sand is fine. [PORT CLAY]				
21.00m - 32.00m		Stiff dark brownish grey fissured silty CLAY. [PORT CLAY]				
32.00m - 34.00m		Stiff brownish grey slightly gravelly silty CLAY. Gravel is angular fine of limestone. [PORT CLAY]				
34.00m - 35.00m		Dark grey slightly sandy GRAVEL. Sand is coarse. Gravel is angular fine to coarse of limestone. [GLACIAL DEPOSITS]				
35.00m - 35.60m		Dark grey slightly silty GRAVEL with medium cobble content with rare randomly oriented calcite veins (<3mm). Gravel is angular and subangular medium and coarse of limestone. Cobbles are (100mm x 90mm x 80mm) angular to subrounded strong dark grey micritic limestone. [GLACIAL DEPOSITS]				
35.60m - 41.60m		Strong and medium strong dark grey and grey micritic LIMESTONE with some extremely closely spaced calcite veins. Some non-intact recovery. Some non-intact recovered as light brown and brown angular and subangular fine to coarse clayey gravel of weak limestone Lith relics. Highly weathered. [LIMESTONE BEDROCK]				

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-N-01	720477.841E, 733956.889N	05/01/2022	DG & JL	---	---	---
Notes: Borehole is located 140m from the entrance to Pigeon House Harbour and just 30m approximately from the dolphin now used as a bird sanctuary.						
Metres from Surface		Description				
0.00m - 0.50m		Very soft, dark grey, silty, very sandy CLAY with occasional shell fragments. Sand is fine.				
0.50m - 1.50m		Dark grey, silty, slightly clayey, gravelly SAND with shell fragments. Sand is fine. Gravel is fine to medium.				
1.50m - 2.50m		Dark grey, silty, sandy CLAY with medium strong odour.				
2.50m - 3.00m		Dark grey to grey, silty SAND with rare shell fragments. Sand is fine to medium.				
3.00m - 3.45m		Dark grey, slightly sandy, silty CLAY with abundant organic matter. Sand is fine to medium.				
3.45m - 5.00m		Dark grey, slightly sandy, silty CLAY with abundant organic matter. Sand is fine to medium.				
5.00m - 5.50m		Dark grey to grey, silty SAND with rare shell fragments (45mm x 3mm). Sand is fine to medium.				
5.50m - 7.00m		Grey, gravelly SAND with shell fragments (3mm x 2mm). Sand is fine to coarse. Gravel is fine to medium, subangular and subrounded of limestone and green schist.				
7.00m - 8.50m		Very soft and soft, greenish grey to grey silty CLAY.				
8.50m - 9.50m		Grey, clayey, sandy GRAVEL with low cobble content (<150mm x 65mm x 15mm). Sand is fine to medium. Gravel is fine to coarse, subangular gravel of limestone.				
9.50m - 10.00m		Grey Clayey, sandy GRAVEL with low cobble content (<135mm x 95mm x 70mm). Sand is fine to medium. Gravel is fine to coarse, subangular to subrounded of limestone and green schist.				
10.00m - 10.50m		Grey, sandy Gravel with low cobble content (<140 x 140 x 10mm). Sand is fine to medium. Gravel is fine to coarse, subangular to subrounded of limestone.				
10.50m - 10.95m		SPT - recovery 220mm. as above.				
10.50m - 11.00m		Dark grey sandy GRAVEL with low cobble content (<90 x 65 x 40mm). Sand is fine to coarse. Gravel is fine to coarse, subangular to rounded of limestone, siltstone, and sandstone.				
11.00m - 11.50m		Environmental sample - Dark grey sandy GRAVEL. Sand is fine to medium. Gravel is fine to medium, subangular to subrounded of limestone, sandstone, and siltstone.				
11.50m - 11.95m		SPT - recovery 330mm. Dark grey sandy GRAVEL. Sand is fine to medium. Gravel is fine to medium, subangular to subrounded of limestone, sandstone, and siltstone.				
11.50m - 12.50m		Dark grey SAND and GRAVEL with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone, sandstone, calcite, and green basalt. Cobbles (<110mm x 65 x 70mm) are subrounded of limestone.				
12.50m - 12.95m		STP - Recovery 200mm. Dark grey sandy, silty GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone				
12.50m - 13.00m		Dark grey, slightly sandy Gravel with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, subangular to rounded of limestone, sandstone, and quartz. Cobbles (<76mm x 63mm x 45mm) are rounded of limestone.				
13.00m - 13.50m		Dark grey, very sandy, slightly silty GRAVEL with occasional pockets of soft brownish grey indistinctly fissured clay with lenses of fine sand. Sand is fine to coarse. Gravel is fine to coarse, subangular to rounded of limestone, mudstone, and sandstone.				
13.50m - 13.95m		SPT - recovery 450mm. Dark grey, very silty SAND. Sand is fine to medium, predominantly fine.				
14.00m - 14.50m		No sample				
14.50m - 14.95m		UT - Dark grey, very silty SAND. San is fine.				
15.00m - 15.50m		Dark grey, very gravelly SILT. Gravel is subangular to rounded, fine and				

	coarse, predominantly fine to medium of limestone.
15.50m - 15.95m	SPT - recovery 380mm. Dark grey, slightly sandy, gravelly SILT. Gravel is angular and subangular and fine.
16.00m - 16.50m	Firm dark grey, indistinctly fissured silty CLAY
16.50m - 16.95m	UT - Full recovery. Firm dark grey CLAY.
16.00m - 18.50m	Firm dark grey silty CLAY.
18.50m - 23.50m	Stiff dark grey silty fissured CLAY.
23.50m - 27.00m	Stiff dark grey to grey silty, sandy fissured CLAY. Sand is fine
27.00m - 31.50m	Stiff grey, silty fissured CLAY.
31.50m - 31.95m	SPT - Firm dark grey silty CLAY. Thinly laminated.
32.00m - 32.50m	Soft, dark grey, silty, indistinctly fissured CLAY.
32.50m - 33.00m	UT - Full recovery. Firm dark grey CLAY.
33.00m - 33.50m	Soft, dark grey, silty CLAY with silt partings.
33.50m - 33.95m	SPT - recovery 250mm. Dark grey, very Gravelly SAND with one pocket of soft dark grey clay (<50 x 35 x 35mm). Sand is fine to coarse. Gravel is subangular to subrounded of mixed lithologies predominantly limestone.
33.50m - 34.00m	Bult oversample. Medium dense, dark grey, sandy, slightly clayey GRAVEL with low cobble (<120 x 70 x 40mm) content. Sand is medium and coarse. Gravel is angular to subrounded, fine to coarse of mixed lithologies including limestone and sandstone.
34.00m - 34.50m	Dark grey, slightly sandy GRAVEL with low cobble content. Sand is medium and coarse. Gravel is angular to rounded, fine to coarse of mixed lithologies including limestone, siltstone, sandstone, calcite, and quartz.
34.50m - 34.88m	SPT
34.50m - 35.00m	BULK
35.00m - 35.50m	Dark grey, slightly sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded of mixed lithologies predominantly limestone.
35.50m - 35.70m	Dark grey, slightly sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, predominantly fine, and medium of limestone and quartz.
35.70m - 36.70m	Assumed core loss.
36.70m - 36.90m	SPT - Dark grey, slightly sandy GRAVEL. Sand is fine to medium. Gravel is fine to coarse, angular, and subangular, fine, and coarse of limestone.
36.70m - 37.20m	No Recovery.
37.20m - 38.20m	Very dense, dark grey GRAVEL with medium cobble content. Gravel is subangular to rounded, medium to coarse of limestone. Cobbles (<130mm x 100mm x 60mm) SR of limestone.
38.20m - 38.70m	Dark grey GRAVEL with medium cobble content. Gravel is subangular and subrounded, medium to coarse of limestone. Cobbles (<130 x 95 x 55mm) are SA of limestone.
38.70m - 39.20m	Dark grey GRAVEL with medium cobble content. Gravel is A-R, medium to coarse of limestone. Cobbles (<140mm x 95mm x 95mm) are Sr of limestone.
39.20m - 39.70m	No Recovery.
39.70m - 39.80m	Dark grey GRAVEL. Gravel is A-R, medium to coarse of limestone.
39.80m - 40.70m	No Recovery.
40.70m - 41.05m	Very dense, dark grey GRAVEL. Gravel is A-R, medium to coarse of limestone.
41.05m - 41.96m	Medium strong to strong, dark grey LIMESTONE with closely spaced calcite veins. Slightly sulphurous odour when struck with a hammer.
41.96m - 43.90m	Strong dark grey LIMESTONE with frequent bivalve fossils
43.90m - 44.40m	Strong dark grey LIMESTONE. very thinly laminated.

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-N-02	720692.358E, 733964.710N	28/01/2023	JL	---	---	---
Notes: Borehole completed on the 29/01/2023. Port Clay from 18.50m.						
Metres from Surface		Description				
0.00m - 1.00m		Very soft, dark grey, slightly sandy, slightly clayey SILT. Sand is fine.				
1.00m - 3.50m		Very soft, dark grey, silty CLAY.				
3.50m - 5.30m		Medium dense, becoming dense, grey, and brownish grey, silty SAND with partings with clay. Sand is fine.				
5.30m - 6.50m		Firm, grey, and brownish grey, silty CLAY.				
6.50m - 8.00m		Dense, dark grey SAND. Sand is fine to coarse.				
8.00m - 15.00m		Stiff, dark grey, silty CLAY.				
15.00m - 15.50m		Soft and firm, dark grey, silty CLAY.				
15.50m - 17.00m		Stiff, dark grey CLAY.				
17.00m - 18.50m		Stiff, dark grey, slightly sandy CLAY. Sand is fine.				
18.50m - 26.50m		Stiff, dark grey, silty CLAY. [Port Clay]				
26.50m - 30.00m		Very dense, dark grey and grey, slightly silty, sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to subangular, fine to coarse of limestone.				
30.00m - 31.00m		Very dense, dark grey and grey, sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of limestone, siltstone, quartz, and red jasper.				
31.00m - 31.35m		Dark grey, slightly clayey GRAVEL with low cobble content. Gravel is angular to rounded, fine to coarse of limestone.				
31.35m - 32.00m		Assumed zone of core loss.				
32.00m - 33.50m		No Recovery				
33.50m - 34.05m		Assumed zone of core loss.				
34.05m - 36.50m		Very dense, dark grey and brown, slightly sandy, slightly clayey GRAVEL with low cobble content. Sand is medium and coarse. Gravel is angular to subrounded, fine to coarse of limestone.				
36.50m - 39.50m		Dark grey, slightly sandy, slightly clayey GRAVEL with high cobble content. Sand is medium and coarse. Gravel is subangular to rounded, fine to coarse of limestone.				
39.50m - 40.80m		No Recovery				
40.80m - 48.60m		Very dense, dark grey, slightly sandy, silty GRAVEL with high cobble content. Gravel is subangular to subrounded, fine to coarse of limestone.				

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-N-03	720909.944E, 733973.137N	24/01/2023	JL			
Notes:						
Metres from Surface		Description				
0.00m - 1.50m		Very soft, black slightly sandy SILT with strong sulphurous odour. Sand is fine.				
1.50m - 3.50m		Very soft and soft, black slightly gravelly, sandy silty CLAY with low cobble content. Strong sulphurous odour. Sand is fine to medium. Gravel is subangular to subrounded of limestone and sandstone.				
3.50m - 5.00m		Medium dense, grey, very sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse of limestone and sandstone, siltstone, and quartzite.				
5.00m - 7.00m		Medium dense, firm, greyish brown, sandy, very gravelly, silty CLAY. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of limestone and sandstone, siltstone.				

7.00m - 11.00m	Medium dense, stiff, dark brown, slightly sandy, silty CLAY. Sand is fine and medium.
11.00m - 11.50m	Stiff, greyish brown, slightly sandy, slightly gravelly CLAY. Sand is fine. Gravel is subrounded, fine of limestone.
11.50m - 18.50m	Stiff, grey, and brownish grey, silty CLAY.
18.50m - 20.50m	Dense, dark grey and grey, silty SAND. Sand is fine.
Rotary	
20.50m - 21.00m	Dark grey, gravelly boulder of LIMESTONE with few calcite veins with low cobble content. Gravel is subangular and subrounded, medium and coarse of limestone and green schist.
21.00m - 21.50m	Assumed zone of core loss.
21.50m - 24.50m	Dark grey, slightly clayey GRAVEL with medium cobble content. Gravel is angular to subrounded, medium to coarse of limestone, sandstone, green schist, and mudstone.
24.50m - 25.25m	No recovery.
25.25m - 25.45m	Dark grey GRAVEL with low cobble content. Gravel is angular to subrounded, medium to coarse of limestone.
25.45m - 26.00m	Assumed zone of core loss.
26.00m - 26.10m	Dark grey GRAVEL. Gravel is subangular and subrounded, medium to coarse of limestone.
26.10m - 27.30m	Assumed zone of core loss.
27.30m - 27.50m	Very dense, dark grey and brown GRAVEL. Gravel is angular to subrounded, fine to coarse of limestone and mudstone.
27.50m - 28.42m	No recovery.
28.42m - 29.00m	Dark grey and light grey GRAVEL with medium cobble content. Gravel is angular to subrounded, fine to coarse of limestone.
29.00m - 31.05m	Dark grey, slightly clayey GRAVEL with medium cobble content. Gravel is angular to subrounded, fine to coarse of limestone.
31.05m - 32.75m	Dark grey and grey, slightly sandy, slightly clayey GRAVEL with low cobble content. Gravel is angular to subrounded, fine to coarse of limestone, green schist, and greywacke.
32.75m - 33.75m	Assumed zone of core loss.
33.75m - 35.55m	Very dense, dark grey, sandy, clayey GRAVEL with low cobble content. Gravel is angular to subrounded, fine to coarse of limestone, sandstone, and greywacke.
35.55m - 39.30m	Dark grey, slightly sandy, clayey GRAVEL with low cobble content. Sand is medium and coarse. Gravel is angular to subrounded, medium and coarse of limestone and sandstone.
39.30m - 44.60m	Strong and very strong, dark GREYWACKE with occasional quartz.

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-N-04	721127.038E, 733981.145N	30/01/2023	JL	---	---	---
Notes:						
Metres from Surface		Description				
0.00m - 0.50m		Grey, slightly silty, gravelly SAND with occasional shell fragments. Sand is fine to medium.				
0.50m - 2.00m		Grey, slightly silty SAND with occasional shell fragments. Sand is fine.				
2.00m - 7.00m		Grey, slightly silty sandy GRAVEL with some shell fragments. Sand is fine and medium. Gravel is subangular to rounded, fine to coarse of limestone, sandstone, green schist, and quartz.				
7.00m - 9.50m		Very dense, grey gravelly SAND with medium cobble content. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of limestone, sandstone, green schist, and mudstone.				
9.50m - 10.00m		Dense, grey, sandy GRAVEL with high cobble content. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of limestone, siltstone, sandstone, and schist.				
10.00m - 11.00m		Soft, brownish grey, slightly gravelly, sandy CLAY. Sand is fine to coarse.				

	Gravel is subangular to rounded, fine and medium of limestone.
11.00m - 14.00m	Soft and firm, brownish grey, silty CLAY.
14.00m - 22.50m	Stiff, brownish grey to grey, slightly silty to silty CLAY.
22.50m - 25.00m	Medium dense, dark grey, silty SAND. Sand is fine.
25.00m - 25.50m	Dark grey, very gravelly, slightly silty SAND with low cobble content. Sand is fine to coarse.
22.50m - 26.10m	Very dense, dark grey, very sandy GRAVEL. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse, predominantly fine of limestone, sandstone, siltstone, calcite, and green schist.
26.10m - 27.00m	Grey and dark grey, slightly sandy, slightly silty GRAVEL with medium cobble content. Sand is medium and coarse. Gravel is subangular and subrounded, medium and coarse of limestone.
27.00m - 27.85m	Moderately weak and medium strong grey LIMESTONE.
27.85m - 29.38m	Very strong to extremely strong, dark grey LIMESTONE.
29.38m - 29.60m	Strong, light grey, fossiliferous LIMESTONE.
29.60m - 32.50m	Strong, light grey and grey, fine-grained LIMESTONE.
32.50m - 33.00m	No recovery. Assumed zone of core loss.
33.00m - 33.75m	Strong and very strong, grey fine-grained LIMESTONE
33.75m - 35.25m	No recovery.
35.25m - 35.65m	Medium strong, fine-grained LIMESTONE
35.65m - 43.50m	Medium strong and strong, GREYWACKE

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-N-05	721207.269E, 733947.844N	03/02/2023	JL	---	---	---
Notes:						
Metres from Surface		Description				
0.00m - 1.00m		Dense, grey, slightly silty SAND with occasional shell fragments. Sand is fine.				
1.00m - 2.50m		Grey, slightly silty, gravelly SAND with frequent shell fragments. Sand is fine to coarse. Gravel is subangular to rounded, fine to medium of limestone.				
2.50m - 5.00m		Medium dense, grey slightly silty SAND. Sand is fine.				
5.00m - 8.50m		Medium dense, grey sandy Gravel with occasional shell fragments. Sand is fine to coarse. Gravel is angular to rounded of limestone, siltstone, and sandstone.				
8.50m - 9.00m		Soft, sandy, silty CLAY. Sand is fine and medium.				
9.00m - 9.50m		Very loose, grey, very sandy, silty GRAVEL with cobble content and with pockets of very soft, grey, sandy silty CLAY. Sand is fine to medium.				
9.50m - 10.50m		Very soft, brownish grey, slightly gravelly, very sandy SILT. Sand is fine and medium. Gravel is fine and medium, subangular and subrounded of limestone.				
10.50m - 12.00m		Very dense, brownish grey, very sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to rounded of mixed lithologies.				
12.00m - 12.50m		Brownish grey, sandy, clayey GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to rounded of limestone, sandstone, and mudstone.				
12.50m - 15.50m		Firm and stiff, brownish grey, slightly sandy CLAY. Sand is fine.				
15.50m - 16.50m		Firm, brownish grey, very sandy SILT. Sand is fine and medium.				
16.50m - 19.00m		Firm, brownish grey, slightly sandy, silty CLAY. Sand is fine.				
19.00m - 25.50m		Stiff, brownish grey to grey, silty CLAY.				
25.50m - 27.50m		Loose, dark grey to grey, silty to very silty SAND. Sand is fine.				
27.50m - 28.50m		Medium dense, dark grey to grey, silty SAND. Sand is fine.				
28.50m - 29.70m		Very dense, dark grey to grey, clayey, sandy GRAVEL. Sand is fine. Gravel is subangular to subrounded, fine to coarse, predominantly fine to medium of limestone.				

29.70m - 30.45m	Dark grey to grey, sandy, clayey, gravelly COBBLES. Sand is fine. Gravel is subangular to rounded, medium to coarse of limestone.
30.45m - 33.45m	Dark grey to grey, sandy, clayey GRAVEL. Sand is fine. Gravel is subangular to rounded, medium to coarse of limestone.
33.45m - 34.20m	Dark grey to grey, sandy, clayey GRAVEL. Sand is fine. Gravel is subangular to rounded, fine to coarse of limestone.
34.20m - 34.95m	No recovery. Assumed zone of core loss.
34.95m - 36.90m	Dark grey to grey, sandy, clayey GRAVEL with medium cobble content. Sand is fine. Gravel is subangular to rounded, fine to coarse of limestone.
36.90m - 38.70m	No recovery. Assumed zone of core loss.
38.70m - 39.45m	Dark grey, slightly gravelly, silty SAND. Sand is fine to coarse. Gravel is subangular to rounded, fine to medium of limestone.
39.45m - 40.20m	No recovery. Assumed zone of core loss.
40.20m - 41.84m	Dark grey, sandy, clayey GRAVEL with low cobble content. Sand is medium and coarse. Gravel is angular to rounded, medium and coarse of limestone.
41.84m - 42.67m	Dark grey, very gravelly, silty SAND. Sand is medium and coarse. Gravel is subangular to rounded, fine to coarse of limestone and mudstone.
42.67m - 43.20m	No recovery. Assumed zone of core loss.
43.20m - 44.25m	Strong, dark grey COBBLES with some silty sand. Cobbles are angular and subangular of limestone.
44.25m - 45.40m	No recovery. Assumed zone of core loss. "
45.40m - 49.90m	Dark grey and grey, slightly sandy, slightly clayey GRAVEL with low cobble content. Sand is medium and coarse. Gravel is angular to rounded, of limestone and green schist.
49.90m - 50.95m	Strong and very strong, dark grey LIMESTONE.
50.95m - 52.90m	Medium strong, light grey and grey LIMESTONE.

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-N-06	721021.037E, 733927.751N	10/01/2022	JL	---	---	F003
Notes: Borehole is located north of NORA jetty and ESB outflow. Animal bone sample taken from made ground. Sample retained but not considered to be from a secure context (Made ground). Rotary coring from 29m						
Metres from Surface		Description				
0.00m - 0.50m		Brownish grey, very gravelly SAND with frequent shell and shell fragments. One bone fragment recovered (60mm x 20mm x 10mm). Sand is medium to coarse. Gravel is fine to coarse of mixed lithologies, sandstone and siltstone.				
0.50m - 1.00m		Loose, brownish grey, very gravelly, slightly silty SAND with frequent shell fragments. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of mixed lithologies, sandstone and siltstone.				
1.00m - 1.50m		Greyish brown, gravelly, slightly silty SAND with shell fragments. Sand is fine to coarse. Gravel is angular to subrounded, fine to medium of mixed lithologies including limestone, and sandstone.				
1.50m - 1.95m		Standard penetration test. Greyish brown, slightly silty SAND with occasional shell fragments. Sand is fine to medium.				
2.00m - 2.50m		Greyish brown, very gravelly, silty SAND with shell fragments. Sand is fine and medium. Gravel is subangular to rounded, fine to coarse of limestone, quartz, sandstone, and chert.				
2.50m - 3.00m		Medium dense, grey, sandy, slightly silty GRAVEL with occasional shell fragments. Sand is fine and medium. Gravel is subangular to rounded, fine to coarse of limestone, quartz, sandstone, and chert.				
3.00m - 3.50m		Grey, sandy GRAVEL with medium cobble content and occasional shell fragments. Sand is coarse. Gravel is subangular to rounded, fine to coarse of limestone, quartz, sandstone, and chert.				
3.50m - 4.00m		Medium dense, slightly sandy GRAVEL with low cobble content. Sand is medium and coarse. Gravel is subangular to rounded, fine to coarse of				

	limestone, quartz, sandstone, and red jasper.
4.00m - 4.50m	Grey, slightly sandy GRAVEL. Sand is fine to coarse. Gravel is subangular to rounded, fine to medium of limestone, quartz, sandstone, and red jasper.
4.50m - 6.00m	Medium dense, grey GRAVEL with low cobble content. Sand is fine and medium. Gravel is subrounded and rounded, fine to coarse of mixed lithologies. Cobble (100mm x63mm x 50mm) are subrounded of limestone. Becoming sandy with depth.
6.00m - 6.50m	Grey, very sandy GRAVEL with frequent shell fragments. Sand is fine to coarse. Gravel is subangular to rounded, fine to medium of limestone, quartz, sandstone, and red jasper.
6.50m - 7.00m	Grey very sandy GRAVEL with occasional shell fragments. Sand is medium to coarse. Gravel is fine to coarse of mixed lithologies including limestone, sandstone, quartz, siltstone, and green basalt.
7.00m - 8.50m	Grey, very sandy GRAVEL with occasional shell fragments and rare shell. Low cobble content (100mm x 80mm x 30mm). Sand is medium to coarse. Gravel is subangular to rounded, fine to coarse of mixed lithologies.
8.50m - 9.00m	Dark grey, gravelly SAND. Sand is medium and coarse. Gravel is subangular to rounded, fine and medium of limestone and sandstone.
9.00m - 9.50m	Dark grey, sandy GRAVEL with low cobble content (120mm x 75mm x 63mm). Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of mixed lithologies. Cobble is subangular of limestone.
9.50m - 10.00m	Very dense, grey SAND and GRAVEL with low cobble content (120mm x 80mm x 65mm). Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse. Cobble is rounded of limestone.
10.00m - 11.00m	Grey, very sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of mixed lithologies. Cobble (110mm x 80mm x 60mm) is subrounded and rounded of limestone.
11.00m - 12.00m	Grey, very sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of mixed lithologies. Chert cobble (150mm x 100mm x 40mm).
12.00m - 14.00m	Grey, sandy GRAVEL. Sand is fine to coarse. Gravel is subangular and subrounded of limestone and green schist.
14.00m - 15.00m	Stiff, dark grey to grey, slightly silty CLAY
15.00m - 16.50m	Soft and firm, dark greenish brown, slightly sandy, silty CLAY. Sand is fine to medium.
16.00m - 23.00m	Soft and firm, dark greenish brown, slightly sandy, silty CLAY. Sand is fine to medium, becoming grey and less sandy with depth.
23.00m - 26.00m	Soft and firm, dark grey, silty CLAY.
26.00m - 28.00m	Medium dense, dark grey silty SAND. Sand is fine to medium.
28.00m - 28.50m	Very dense, dark grey and grey, gravelly SAND. Sand is fine and medium. Gravel is subangular and subrounded, fine and medium of limestone.
28.50m - 30.50m	Very dense, dark grey to grey gravelly SAND. Sand is fine to medium. Gravel is fine to medium of limestone. Limestone cobble from 29m.
30.50m - 32.50m	Very dense, dark grey, silty sandy GRAVEL. Sand is fine to medium. Gravel is subangular to rounded, medium to coarse of strong dark grey limestone.
32.50m - 33.60m	Dark grey to grey GRAVEL with medium cobble content. Gravel is subangular to rounded, medium to coarse of limestone.
33.60m - 38.55m	Dark grey to grey GRAVEL with medium cobble content that contain calcite veins. Gravel is subangular to rounded, medium to coarse of limestone. Cobbles are subangular to rounded of limestone becoming subangular with depth.
38.55m - 44.85m	Dark grey, slightly gravelly COBBLES with some calcite veins. Gravel is subangular to rounded, medium to coarse of predominantly limestone. Cobbles are subangular to rounded of limestone.
44.85m - 46.30m	Strong dark grey fine-grained limestone. Highly fractured on recovery

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-N-07	720803.278E, 733918.527N	21/01/2023	JL	---	---	---
Notes:						
Metres from Surface		Description				
0.00m - 2.50m		Very soft, dark grey, silty sandy CLAY with rare shell fragments. Sand is fine				
2.50m - 3.00m		Dark grey, silty, sandy GRAVEL. Sand is fine. Gravel is subangular to rounded of limestone.				
3.00m - 5.00m		Medium dense, dark grey to grey, sandy silty GRAVEL with shell fragments. Sand is fine and medium. Gravel is subangular and subrounded, fine to coarse of mixed lithologies including limestone, sandstone, siltstone, quartz, and calcite.				
5.00m - 7.00m		Medium dense, dark grey to grey, gravelly SAND. Sand is fine to coarse. Gravel is subangular and subrounded, fine and medium of limestone and sandstone.				
7.00m - 8.50m		Grey, slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of limestone.				
8.50m - 9.00m		Very dense, grey, very sandy GRAVEL. Sand is medium and coarse. Gravel is subangular and subrounded, fine and medium of limestone, sandstone, and quartz.				
9.00m - 10.50m		Very dense, brownish grey, very sandy GRAVEL with low cobble content and a moderate hydrocarbon odour. Sand is medium and coarse. Gravel is subangular and subrounded, fine and medium of limestone, sandstone, shale, mudstone, and green schist.				
10.50m - 12.00m		Dense, brownish grey SAND and GRAVEL with low cobble content. Sand is medium and coarse. Gravel is subangular and subrounded, fine and medium of limestone, sandstone, and granite.				
12.00m - 14.00m		Dense, grey, sandy GRAVEL with low cobble content. Sand is medium and coarse. Gravel is subangular to rounded, fine to coarse of mixed lithologies including limestone, sandstone, calcite, and quartz.				
14.00m - 14.50m		Firm, brownish grey and grey, slightly gravelly, slightly sandy, silty CLAY. Sand is fine. Gravel is subangular to subrounded, medium to coarse of limestone.				
14.50m - 16.00m		Firm, becoming stiff, dark grey and grey, silty CLAY.				
16.00m - 28.50m		Stiff dark grey and grey, silty CLAY. [Port Clay]				
28.50m - 29.25m		Dark grey, thinly bedded BOULDER of limestone with medium spaced calcite veins.				
29.25m - 29.40m		Dark, brownish grey silty SAND. Sand is fine to medium.				
29.40m - 29.90m		Very dense, dark grey, sandy, slightly clayey GRAVEL with high cobble content. Sand is medium and coarse. Gravel is subangular and subrounded, medium and coarse of limestone and green schist.				
29.90m - 31.35m		Assumed zone of core loss.				
31.35m - 31.65m		Dark grey and greenish grey, slightly gravelly BOULDER of limestone.				
31.65m - 35.70m		Dark grey and greenish grey, slightly sandy, slightly clayey GRAVEL with high cobble content. Sand is medium and coarse of limestone and green schist.				
35.70m - 36.55m		Assumed zone of core loss.				
36.55m - 36.90m		Very dense, dark grey and grey GRAVEL with high cobble content. Gravel is angular and subangular, medium, and coarse of limestone.				
36.90m - 38.15m		No recovery, assumed zone of core loss.				
38.15m - 41.15m		Very dense, dark grey and grey GRAVEL with low cobble content. Gravel is subangular to subangular, medium, and coarse of limestone.				
41.15m - 42.65m		Dark grey, slightly gravelly, slightly clayey COBBLES of limestone with calcite veins.				
42.65m - 45.95m		Dark grey, slightly gravelly, slightly clayey COBBLES of limestone with calcite veins. Gravel is subangular to subrounded of limestone.				
45.95m - 46.66m		Assumed zone of core loss.				
46.66m - 47.15m		Dark grey and grey, slightly clayey GRAVEL with low cobble content. Gravel is angular and subangular medium and coarse of limestone.				

47.15m - 49.65m	Assumed zone of core loss.
49.65m - 50.25m	Dark grey and grey, slightly clayey, silty GRAVEL and COBBLES. Gravel is angular and subangular, medium, and coarse of limestone.
50.25m - 51.15m	Assumed zone of core loss.
51.15m - 51.95m	Dark grey and grey, slightly clayey, silty GRAVEL with low cobble content. Gravel is subangular and subrounded, medium and coarse of limestone.
51.95m - 52.65m	Assumed zone of core loss.
52.65m - 54.15m	Dark grey and grey, GRAVEL with high cobble content. Gravel is angular to subrounded, fine to coarse of limestone.
54.15m - 56.18m	Strong and very strong, dark grey and grey, medium grained GREYWACKE.
56.18m - 58.65m	Medium strong and strong, very thinly bedded, dark grey and grey, medium grained GREYWACKE.

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-N-08	720588.018E, 733911.091N	13/12/2022	DG & JL	---	---	---
Notes: Borehole location - 720588.380E, 733901.405N. Located beside dolphin close to the NORA Jetty.						
Metres from Surface		Description				
0.00m - 4.50m		Soft dark grey to black slightly sandy silty CLAY with rare organic materials and with medium to strong hydrocarbon odour. Sand is fine. [ESTUARINE DEPOSITS].				
4.50m - 7.00m		Soft Greenish grey silty CLAY with occasional shell fragments (6mm x 5mm) with strong to medium hydrocarbon odour. Sand is fine and medium. [ESTUARINE DEPOSITS].				
7.00m - 11.00m		Dark grey sandy to very sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of limestone green schist and siltstone. Cobbles are (<10mm x 63mm x 70mm) angular and subangular of limestone. [ESTUARINE DEPOSITS].				
11.00m - 11.50m		Dark grey gravelly slightly clayey SAND. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of limestone and siltstone. [ESTUARINE DEPOSITS].				
11.50m - 12.50m		Firm and stiff dark brownish grey slightly calcareous slightly sandy silty CLAY. Sand is fine. [ESTUARINE DEPOSITS].				
12.50m - 14.00m		Dark brownish grey slightly clayey silty SAND. Sand is fine to medium. [ESTUARINE DEPOSITS].				
14.00m - 23.00m		Stiff dark brownish grey calcareous fissured sandy becoming slightly sandy with depth silty CLAY. Sand is fine. [PORT CLAY].				
23.00m - 24.50m		Stiff dark grey and grey indistinctly fissured silty CLAY. [PORT CLAY].				
24.50m - 25.50m		Stiff dark grey and grey indistinctly fissured silty sandy CLAY. Sand is fine. [PORT CLAY].				
25.50m - 26.50m		Firm dark grey and grey silty CLAY. Sand is fine. [PORT CLAY].				
26.50m - 27.50m		Firm dark grey and grey indistinctly fissures slightly sandy silty CLAY. Sand is fine. [PORT CLAY].				
27.50m - 29.00m		Firm dark grey and grey indistinctly fissured silty CLAY. [PORT CLAY].				
29.00m - 30.50m		Firm dark grey and grey indistinctly fissured slightly sandy silty CLAY. Sand is fine. [PORT CLAY].				
30.50m - 31.15m		Firm dark grey and grey indistinctly fissured silty sandy CLAY. Sand is fine. [PORT CLAY].				
31.15m - 34.80m		Dark grey clayey sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded predominantly angular and subangular fine to coarse of limestone, siltstone, green schist, and possible psammites. Cobbles are (<50mm x 90mm x 120mm) angular to rounded of limestone. [GLACIAL DEPOSITS].				
34.80m - 36.10m		Dark grey and grey GRAVELS with low cobbles content. Gravels are subangular and subrounded fine to coarse of limestone, siltstone, and green schist. Cobbles are (<30mm x 63mm x 70mm) subangular and subrounded of limestone. [GLACIAL DEPOSITS]				
36.10m - 37.30m		Dark grey and grey slightly silty very sandy GRAVEL with medium cobble content. Sand is fine to coarse. Gravel is subangular to rounded fine to				

	coarse of limestone, calcite, and meta-basalt. Cobbles are (<30mm x 65mm x 100mm) subangular of limestone. [GLACIAL DEPOSITS].
37.30m - 42.04m	Medium strong to strong brownish grey fossiliferous LIMESTONE. Fresh to weathered with calcite veins. Occasional non-intact recovery. [Limestone Bedrock]

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-N-09	720481.685E, 733856.963N	06/12/2022	DG & JL	---	---	---

Notes: Borehole located approximately 50m from the great south wall.
Port Clay at 16m. Change to rotary coring at 30.60m.
Borehole completed at 43.5m.

Metres from Surface	Description
0.00m - 1.80m	Soft light grey slightly sandy silty CLAY. Sand is fine. [ESTUARINE DEPOSITS]
1.80m - 2.50m	Grey slightly silty sandy GRAVEL. Sand is fine to medium. Gravel is subangular to subrounded fine and medium of limestone. [ESTUARINE DEPOSITS]
2.50m - 3.00m	Dense grey silty slightly gravelly SAND. Sand is fine to coarse. Gravel is subangular to subrounded fine and medium of limestone. [ESTUARINE DEPOSITS]
3.00m - 7.00m	Medium dense and dense light grey sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of mixed lithologies including limestone and green schist. Cobbles are (115mmx90mmx80mm) angular and subangular of limestone. [ESTUARINE DEPOSITS]
7.00m - 7.50m	Brown gravelly silty SAND with occasional shell fragments (15mm x 7mm). Sand is fine to coarse predominately coarse. Gravel is subangular to rounded fine and medium of limestone. [ESTUARINE DEPOSITS]
7.50m - 9.00m	Stiff dark grey sandy slightly gravelly silty CLAY with some shell fragments (10mm x 5mm). Sand is fine and medium. Gravel is subangular to rounded fine of limestone. [ESTUARINE DEPOSITS]
9.00m - 10.60m	Medium dense and dense grey and dark grey slightly silty sandy GRAVEL with rare shell fragments (<7mm) with low cobble content. Sand is medium and coarse predominately coarse. Gravel is angular to subrounded fine to coarse of mixed lithologies including limestone psammite siltstone and green schist. Cobbles are (120mmx100mmx90mm) angular to subrounded of limestone psammite and siltstone. [ESTUARINE DEPOSITS]
10.60m - 11.00m	Dense brown slightly silty SAND. Sand is fine to coarse predominately fine and medium. [ESTUARINE DEPOSITS]
11.00m - 11.50m	Grey and dark grey slightly silty sandy GRAVEL with rare shell fragments (<5mm) with low cobble content. Sand is medium and coarse predominately coarse. Gravel is angular to subrounded fine to coarse of mixed lithologies including limestone psammite siltstone and green schist. Cobbles are (110mmx90mmx80mm) angular to rounded of limestone psammite and siltstone. [ESTUARINE DEPOSITS]
11.50m - 13.00m	Medium dense to very dense brown slightly silty gravelly SAND. Sand is fine to coarse predominately fine and medium. Gravel is subangular and subrounded fine to coarse of limestone siltstone and psammite. [ESTUARINE DEPOSITS]
13.00m - 14.30m	Very dense brownish grey slightly silty SAND. Sand is fine and medium. [ESTUARINE DEPOSITS]
14.30m - 14.90m	Stiff brownish grey fissured silty CLAY. [ESTUARINE DEPOSITS]
14.90m - 16.00m	Brownish grey and dark grey slightly silty SAND. Sand is fine and medium. [ESTUARINE DEPOSITS]
16.00m - 17.00m	Stiff dark grey slightly sandy silty CLAY. Sand is fine. [PORT CLAY]
17.00m - 26.50m	Stiff dark grey fissured silty CLAY. [PORT CLAY]
26.50m - 28.00m	Stiff dark brownish grey silty slightly gravelly CLAY. Gravel is subangular and subrounded fine and medium of psammite and siltstone. [GLACIAL DEPOSITS]

28.00m - 29.00m	Dark brownish grey silty sandy GRAVEL. Sand is medium and coarse predominately coarse. Gravel is angular to subrounded fine to coarse of limestone psammite and siltstone. [GLACIAL DEPOSITS]
29.00m - 30.60m	Very dense dark grey slightly sandy silty GRAVEL with low cobble content. Sand is medium and coarse predominately coarse. Gravel is angular to subrounded fine to coarse of limestone. Cobbles are (120mmx100mmx80mm) angular and subangular of limestone. [GLACIAL DEPOSITS]
30.60m - 31.27m	Strong dark grey micritic LIMESTONE with rare randomly oriented penetrative calcite veins (<8mm). Non intact recovered as dark silty angular and subangular fine to coarse of limestone. Moderately weathered. [LIMESTONE BEDROCK]
31.27m - 43.50m	Very strong to medium strong grey micritic LIMESTONE with some subvertical closely spaced calcite veins. Weathered to varying degrees. [LIMESTONE BEDROCK]

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-N-10	720698.195E, 733865.293N	09/12/22	JL	---	---	---
Notes: Located close to the NORA Jetty						
Metres from Surface	Description					
0.00m - 1.50m	Dark grey slightly sandy silty CLAY with rootlets (<1mm) with occasional organic material (70mmx4mm). Sand is fine. Strong organic odour. [ESTUARINE DEPOSITS]					
1.50m - 2.30m	Dark grey silty CLAY. [ESTUARINE DEPOSITS]					
2.30m - 4.50m	Grey sandy GRAVEL with low cobble content with occasional shell fragments (16mm x 10mm). Sand is fine to coarse. Gravel is rounded and subrounded fine to coarse of mixed lithologies including limestone and green schist. Cobbles are (90mmx80mmx70mm) fine to coarse of limestone. [ESTUARINE DEPOSITS]					
4.50m - 5.25m	Soft and firm grey gravelly sandy silty CLAY with shell fragments (7mm x 5mm) and shells (11mm x 20mm). Sand is fine to coarse. Gravel is subrounded and rounded fine to coarse of limestone. [ESTUARINE DEPOSITS]					
5.25m - 10.00m	Dense and very dense grey and brownish grey slightly silty sandy GRAVEL. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of mixed lithologies including limestone, psammites, siltstone, and green schist. Cobbles are (120mm x 90mm x 70mm) fine to coarse of limestone, psammites, and siltstone. [ESTUARINE DEPOSITS]					
10.00m - 10.50m	Soft grey gravelly silty sandy CLAY. Sand is fine and medium. Gravel is fine and medium of limestone siltstone psammite. [PORT CLAY]					
10.50m - 11.00m	Firm and stiff grey gravelly silty sandy CLAY. Sand is fine and medium. Gravel is fine and medium of limestone siltstone and psammite.					
11.00m - 11.50m	Firm grey fissured silty CLAY [PORT CLAY]					
11.50m - 20.50m	Stiff grey fissured silty CLAY [PORT CLAY]					
20.50m - 25.00m	Stiff dark grey silty CLAY [PORT CLAY]					
25.00m - 26.00m	Stiff grey slightly sandy CLAY. Sand is fine [PORT CLAY]					
26.00m - 29.00m	Stiff grey calcareous indistinctly fissured silty CLAY. [PORT CLAY].					
29.00m - 29.45m	Stiff grey fissured calcareous slightly gravelly slightly sandy silty CLAY. Sand is fine. Gravel is subangular fine to medium of limestone. [PORT CLAY].					
29.45m - 30.00m	Stiff grey calcareous gravelly sandy CLAY with low cobble content. Sand is fine. Gravel is subangular and subrounded fine to coarse of limestone, psammites, and green schist. Cobbles are (70mm x 60mm x 30mm) subrounded and rounded of limestone. [GLACIAL DEPOSITS].					
30.00m - 31.10m	Dark grey slightly silty sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of limestone, siltstone, psammites, and green schist. Cobbles are (80mm x 70mm x 40mm) subangular and subrounded of limestone. [GLACIAL DEPOSITS].					
31.10m - 31.50m	Assumed zone of core loss.					

31.50m - 32.50m	Dark grey COBBLES with some GRAVEL. Gravels are subangular to rounded coarse of dark grey limestone, light grey limestone, and green schist. Cobbles are (160mm x 100mm x 90mm) subangular to subrounded of strong dark grey micritic limestone with rare shell fragments (<3mm x 20mm) [GLACIAL DEPOSITS]
32.50m - 32.90m	Dark grey COBBLES with some GRAVEL. Gravels are subangular to rounded, elongated, coarse of dark grey limestone. Cobbles are (130mm x 90mm x 40mm) subangular to subrounded of strong dark grey micritic limestone with rare clay coating and rare calcite veins (<2mm). [GLACIAL DEPOSITS].
32.90m - 35.00m	Assumed zone of core loss.
35.00m - 35.10m	Dark grey GRAVEL with low cobble content. Gravels are subangular to subrounded medium to coarse of limestone. Cobbles are (<50mm x 95mm x 140mm) subangular to subrounded of dark grey limestone with calcite veins (< 10mm x 100mm). [GLACIAL DEPOSITS].
35.10m - 35.60m	Assumed zone of core loss.
35.60m - 36.10m	Dark grey GRAVEL with low cobble content. Gravels are subangular to subrounded medium to coarse of limestone. Cobbles are (<120mm x 100mm x 80mm) subangular to subrounded of dark grey limestone. [GLACIAL DEPOSITS]
36.10m - 41.50m	Assumed zone of core loss.
41.50m - 42.00m	Dark grey and grey COBBLES with some GRAVEL. Gravels are subangular to rounded coarse of dark grey and light grey limestone with occasional clay coating. Cobbles are (100mm x 70mm x 50mm) subangular to rounded of strong dark grey micritic limestone with frequent calcite veins (<5mm). [GLACIAL DEPOSITS]
42.00m - 43.00m	Assumed zone of core loss.
43.00m - 43.25m	Strong dark grey micritic LIMESTONE with frequent closely spaced calcite veins. Non intact recovered as subangular cobbles (140mm x 90mm x 90mm) of limestone.
43.25m - 43.50m	Assumed zone of core loss. Borehole terminated at original target depth due to borehole stability.

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-N-11	720913.972E, 733868.481N	18/01/2023	JL	---	---	---
Notes: Completed on the 20/01/2023.						
Metres from Surface	Description					
0.00m - 2.50m	Dense, grey, slightly silty, gravelly SAND with some shell fragments. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse, predominantly fine, and medium of limestone and sandstone. [Estuarine Deposits]					
2.50m - 6.00m	Medium dense, grey, sandy GRAVEL with some shell fragments. Sand is fine to medium. Gravel is subangular to rounded, fine to coarse of mixed lithologies including limestone, sandstone quartz and green schist. [Estuarine Deposits]					
6.00m - 7.00m	Grey, very gravelly SAND with occasional shell fragments. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of mixed lithologies including limestone, sandstone quartz and green schist. [Estuarine Deposits]					
7.00m - 7.50m	Grey, slightly sandy, clayey GRAVEL with low cobble content and rare shell fragments. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse, of mixed lithologies including limestone, sandstone quartz and green schist. [Estuarine Deposits]					
7.50m - 9.50m	Soft, greenish brown, slightly sandy, gravelly, silty CLAY with abundant shell fragments. Sand is medium. Gravel is subangular and subrounded, fine to coarse of limestone and siltstone.					
9.50m - 11.00m	Very dense, grey, slightly gravelly, clayey SAND. Sand is medium and coarse. Gravel is angular to subrounded, fine and medium of limestone.					
11.00m - 13.00m	Dense, grey, very sandy GRAVEL with low cobble content. Sand is medium to coarse. Gravel is angular to rounded, fine to coarse of mixed lithologies					

	including limestone, sandstone, quartz, and green schist.
13.00m - 13.50m	Grey sandy GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of limestone, siltstone, sandstone, and quartz.
13.50m - 14.00m	Dense, dark grey, clayey, slightly gravelly SAND. Sand is medium and coarse. Gravel is subangular and subrounded, fine and medium of limestone.
14.00m - 16.50m	Stiff, dark grey, silty, sandy CLAY. Sand is fine to medium, predominantly fine. [Port Clay]
16.50m - 23.50m	Stiff, dark grey, silty CLAY. [Port Clay]
23.50m - 26.50m	Stiff, brownish grey, slightly sandy, silty CLAY. Sand is fine.
26.50m - 27.50m	Soft and firm, slightly sandy, slightly gravelly, silty CLAY. Sand is fine. Gravel is subangular and subrounded, fine and medium of limestone.
27.50m - 28.00m	Very soft, sandy, gravelly SILT. Sand is fine to coarse. Gravel is angular to subrounded, fine and medium of limestone and sandstone.
28.00m - 29.00m	Dense, dark grey, very sandy, clayey GRAVEL. Sand is fine to coarse. Gravel is subangular and subrounded, fine and medium of limestone.
29.00m - 31.33m	Very dense, dark grey, gravelly SAND with low cobble content. Sand is medium to coarse. Gravel is fine to medium, angular to subrounded of predominantly limestone. Cobbles subangular to rounded of limestone.
31.33m - 32.90m	Very dense, dark grey GRAVEL with medium cobble content. Gravel is subangular to rounded, fine to coarse of limestone.
32.90m - 33.60m	No recovery. Assumed zone of core loss
33.60m - 35.10m	Very dense, dark grey GRAVEL with medium cobble content. Gravel is subangular to rounded, fine to coarse of limestone.
35.10m - 35.60m	No recovery. Assumed zone of core loss
35.60m - 37.10m	Very dense, dark grey, slightly sandy, clayey GRAVEL. Sand is fine. Gravel is subangular to rounded, fine to coarse of limestone.
37.10m - 37.60m	No recovery. Assumed zone of core loss
37.60m - 40.10m	Very dense, dark grey, slightly sandy, clayey GRAVEL. Sand is fine. Gravel is subangular and subrounded, fine to coarse of limestone.
40.10m - 40.60m	No recovery. Assumed zone of core loss
40.60m - 43.10m	Very dense, dark grey, clayey GRAVEL with medium cobble content. Sand is fine. Gravel is subangular to rounded, medium and coarse of limestone.
43.10m - 45.60m	Dark grey, gravelly COBBLES. Gravel is angular and subangular, medium to coarse of limestone.
45.60m - 47.30m	Dark grey, clayey GRAVEL with low to medium cobble content. Gravel is subangular to angular, medium, and coarse of limestone.
47.30m - 48.30m	No recovery. Assumed zone of core loss
48.30m - 48.60m	Dark grey, clayey GRAVEL with low cobble content. Gravel is subangular to angular, medium, and coarse of limestone.
48.60m - 50.70m	No recovery.
50.70m - 51.60m	Dark grey GRAVEL. Gravel is subangular to rounded, fine to coarse of limestone.
51.60m - 52.20m	Assumed zone of core loss.
52.20m - 52.88m	Very weak, grey SHALE.
52.88m - 54.40m	Possibly medium strong and strong dark grey limestone.
54.40m - 57.3m	Medium strong to very strong, dark grey GREYWACKE. 600mm of core loss at 55.80.

SI reference	Location	Date	Monitor	Photo	Sample	Find
BH-N-12	721034.924E, 733874.727N	15/01/2023	MC & JL	---	---	---
Notes: Borehole completed on the 17/01/2023						
Metres from Surface		Description				
0.00m - 2.00m		Medium dense, grey, gravelly, slightly silty SAND with some shell fragments (<30 x 25mm) with rare shell (<60mm x 25mm). Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse, predominantly fine, and medium of limestone and sandstone. [Estuarine Deposits]				

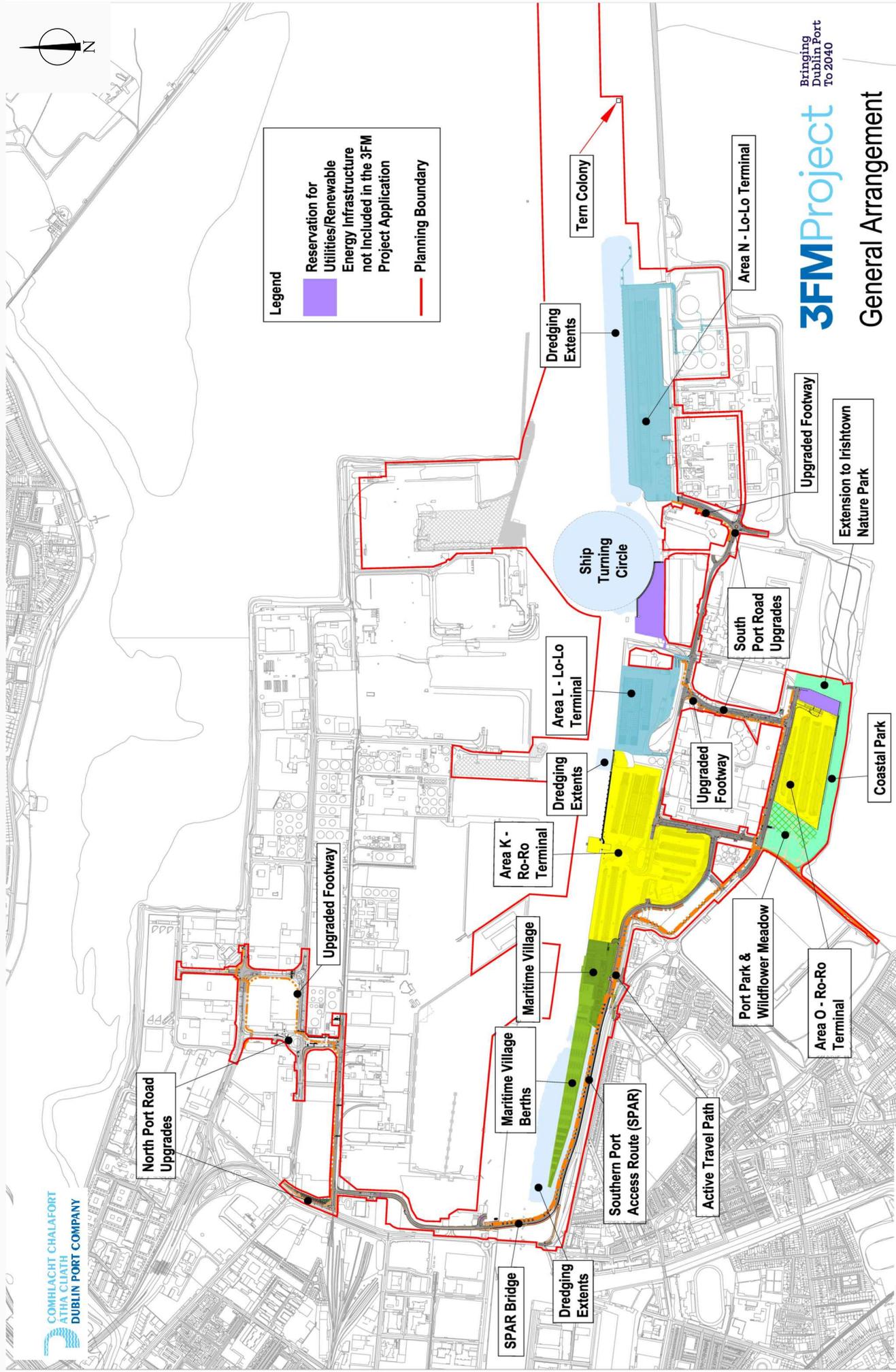
2.00m - 3.00m	Medium dense, grey, very sandy GRAVEL. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse, predominantly fine, and medium of limestone, sandstone, quartz, siltstone, and granite. [Estuarine Deposits]
3.00m - 5.50m	Grey, slightly sandy GRAVEL. Sand is medium and coarse. Gravel is subangular to rounded, fine to coarse of limestone, sandstone, siltstone, and calcite. [Estuarine Deposits]
5.50m - 8.50m	Medium dense, grey gravelly SAND. Sand is fine to coarse. Gravelly is subangular to subrounded of limestone.
8.50m - 13.50m	Very dense, grey, slightly sandy to sandy GRAVEL. Sand is medium to coarse. Gravel is subangular to subrounded, fine to coarse of mixed lithologies including limestone, sandstone, siltstone, quartzes, and green schist.
13.50m - 21.50m	Stiff, dark grey to grey, silty, slightly sandy CLAY. Sand is fine. [Port Clay]
21.50m - 23.50m	Firm and stiff, dark grey, silty CLAY [Port Clay]
23.50m - 25.00m	Medium dense, firm, and stiff, dark grey, slightly sandy, silty CLAY. Sand is fine. [Port Clay]
25.00m - 26.50m	Firm, dark grey, slightly sandy, slightly gravelly, silty CLAY. Sand is fine. Gravel is subangular and subrounded, fine of limestone and sandstone. [Port Clay]
26.50m - 27.50m	Dark grey, very gravelly, slightly silty SAND. Sand is fine to coarse. Gravel is subangular to rounded, fine and coarse of limestone and sandstone. [Glacial Deposits]
27.50m - 29.00m	Very dense, grey, sandy, silty GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of limestone. Cobbles are (<120mm x 80mm x 50mm) angular and subangular of limestone. [Glacial Deposits]
29.00m - 31.25m	Dark grey GRAVEL with medium cobble content. Gravel is subangular and subrounded, medium to coarse of limestone.
31.25m - 31.90m	Dark grey, slightly sandy, slightly silty GRAVEL. Sand is fine. Gravel is subangular to subrounded, medium to coarse of limestone.
31.90m - 32.75m	Dark grey GRAVEL with low cobble content. Gravel is subangular to rounded, medium to coarse of limestone with rare green schist.
32.75m - 33.50m	Assumed zone of core loss.
33.50m - 33.76m	Very dense, dark grey, silty SAND. Sand is fine to coarse.
33.76m - 34.50m	Assumed zone of core loss.
34.50m - 35.85m	Very dense, dark grey, silty, gravelly SAND. Sand is fine to medium. Gravel is subangular and subrounded, fine to medium of limestone.
35.85m - 36.50m	Dark grey to grey, sandy GRAVEL. Sand is fine to medium. Gravel is subangular to rounded, fine to medium of limestone.
36.50m - 37.00m	Dark grey to grey, silty, sandy GRAVEL with low cobble content. Sand is fine to medium. Gravel is subangular to rounded of limestone.
37.00m - 38.50m	Assumed zone of core loss.
38.50m - 39.50m	Very dense, dark grey, slightly sandy GRAVEL. Sand is fine to medium. Gravel is subangular and subrounded, fine to coarse of limestone.
39.50m - 40.00m	Assumed zone of core loss.
40.00m - 42.10m	Dark grey to grey, clayey, slightly, sandy GRAVEL with low cobble content. Sand is fine. Gravel is subangular and subrounded of limestone.
42.10m - 44.10m	Assumed zone of core loss.
44.10m - 46.43m	Very dense, dark grey and grey GRAVEL with medium cobble content. Gravel is subangular to rounded, medium and coarse of limestone. Cobbles are (<130mm x 90mm x 60mm) are subrounded of limestone.
46.43m - 46.90m	Dark grey and grey cobbles. Cobbles are (<170mm x 100mm x 100mm) angular and subangular of limestone.
46.90m - 48.60m	Dark grey, clayey SAND. Sand is fine to coarse.
48.60m - 49.20m	Grey, slightly clayey GRAVEL. Gravel is subangular to rounded, fine and medium of limestone, sandstone, and siltstone.
49.20m - 49.70m	Dark grey, clayey SAND. Sand is fine to coarse.
49.70m - 52.10	Firm and stiff, dark grey, slightly sandy CLAY. Sand is fine to medium. Gravel is subangular to rounded, fine and coarse of limestone, sandstone, quartzite, and siltstone.
52.10m - 53.60m	Dark grey, clayey GRAVEL. Gravel is angular to subrounded of limestone and sandstone.
53.60m - 54.20m	Grey, gravelly COBBLES. Gravel is angular to subrounded, fine to coarse of limestone. Cobbles are subrounded of limestone.

54.20m - 55.60m	Dark grey, slightly clayey GRAVEL. Gravel is angular to rounded, fine to coarse of limestone.
55.60m - 58.60m	Dark grey GRAVEL. Gravel is angular to subrounded, fine to medium of limestone.
58.60m - 59.90m	Dark grey, slightly sandy GRAVEL. Sand is medium and coarse. Gravel is angular and subangular, medium, and coarse of limestone.
59.90m - 62.10m	Grey and light grey sandy GRAVEL. Sand is medium and coarse. Gravel is angular and subangular, fine, and coarse of limestone.
62.10m - 65.20m	Light grey fine-grained LIMESTONE.



Legend

- Reservation for Utilities/Renewable Energy Infrastructure not Included in the 3FM Project Application
- Planning Boundary



3FMProject
Bringing Dublin Port To 2040

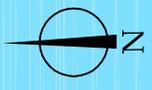
General Arrangement

Notes

Source: Project Drawing provided by RPS/DPC [3FM General Arrangement, V.3]; OS Background Mapping licensed by Ordnance Survey Ireland [CYAL50319610];

A4	Job/Exc No. 23D0037, 23R0148	Compiled by R.Bangerter	CAD reference 3FM_SI_Works	Client RPS/Dublin Port Company (DPC)	Title Figure 1 - Project Drawing showing General Arrangement of the 3FM Project.
	Date 19.06.24	Scale 1:15,000	Drawing No. Figure 1	Project Dublin Port, 3FM Project	



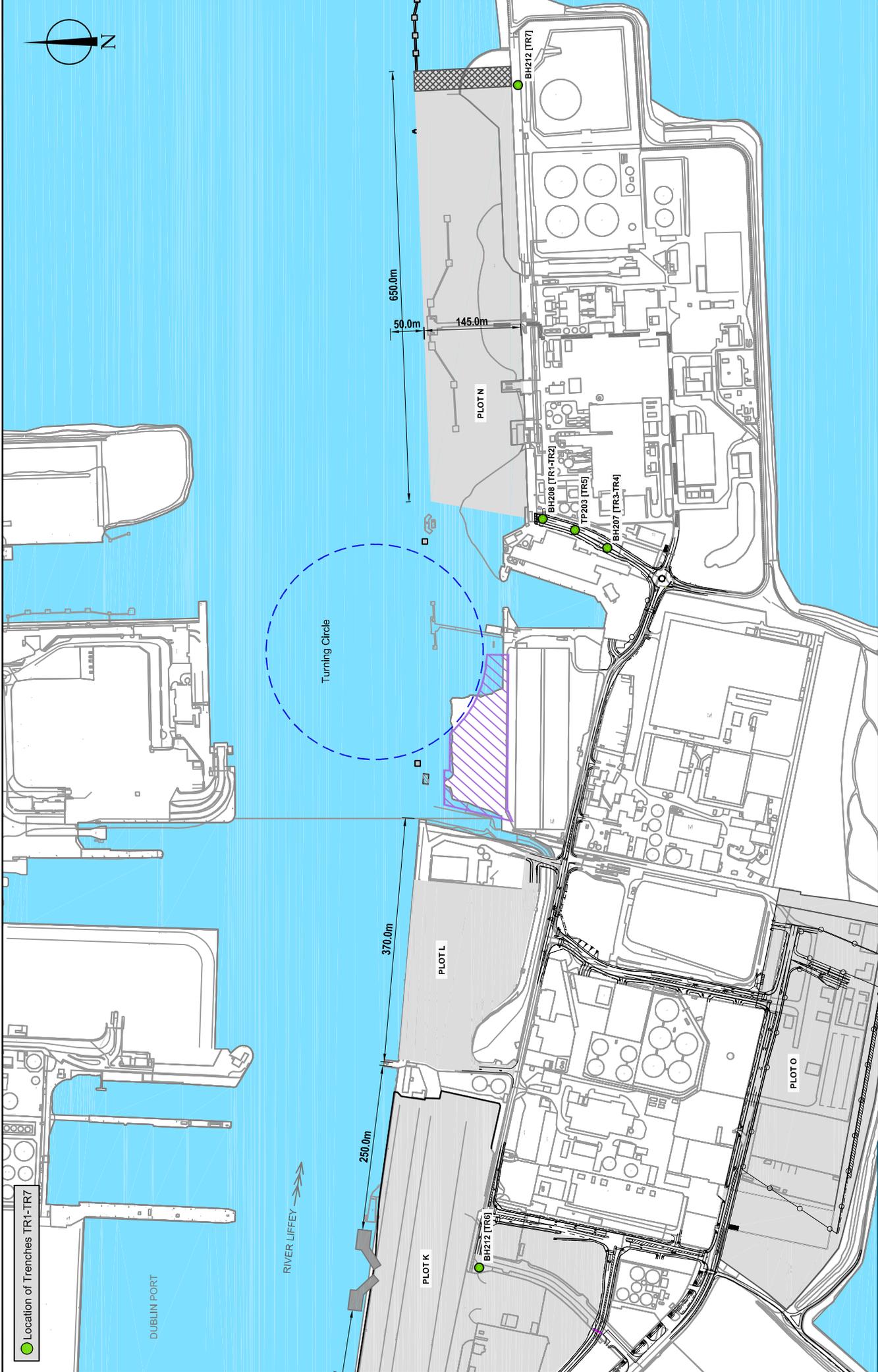


North Bank Lighthouse

Notes Source: Figure adapted from project drawing supplied by RPS (3FM- Marine SI Layout Rev P02). Reservation for Renewable Energy Infrastructure not included in the 3FM Project Application.	A4	Job/Exc No. 22D0007, 22R0001	Compiled by R. Bangertner	CAD reference 3FM_SI_Works	Client RPS/ Dublin Port Company (DPC)	Title Figure 2- OS Background Mapping with 3FM project extent and location of Marine SI Works (Boreholes) superimposed.
	Date 21.06.23	Scale 1:112,500	Drawing No. Figure 2	Project Dublin Port, 3FM Project		

● Location of Marine Boreholes





Notes Source: OS Background Mapping. Reservation for Renewable Energy Infrastructure not included in the 3FM Project Application.	A4 Job/Exc No. 22E0007, 22D001 Date 21.08.23	Compiled by R. Bangster Scale 1:7500	CAD reference 3FM_SI_Works Drawing No. Figure 3	Client RPS/ Dublin Port Company (DPC) Project Dublin Port, 3FM Project	Title Figure 3- Location of Investigation Trenches TR01-TR07.



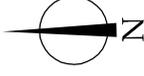


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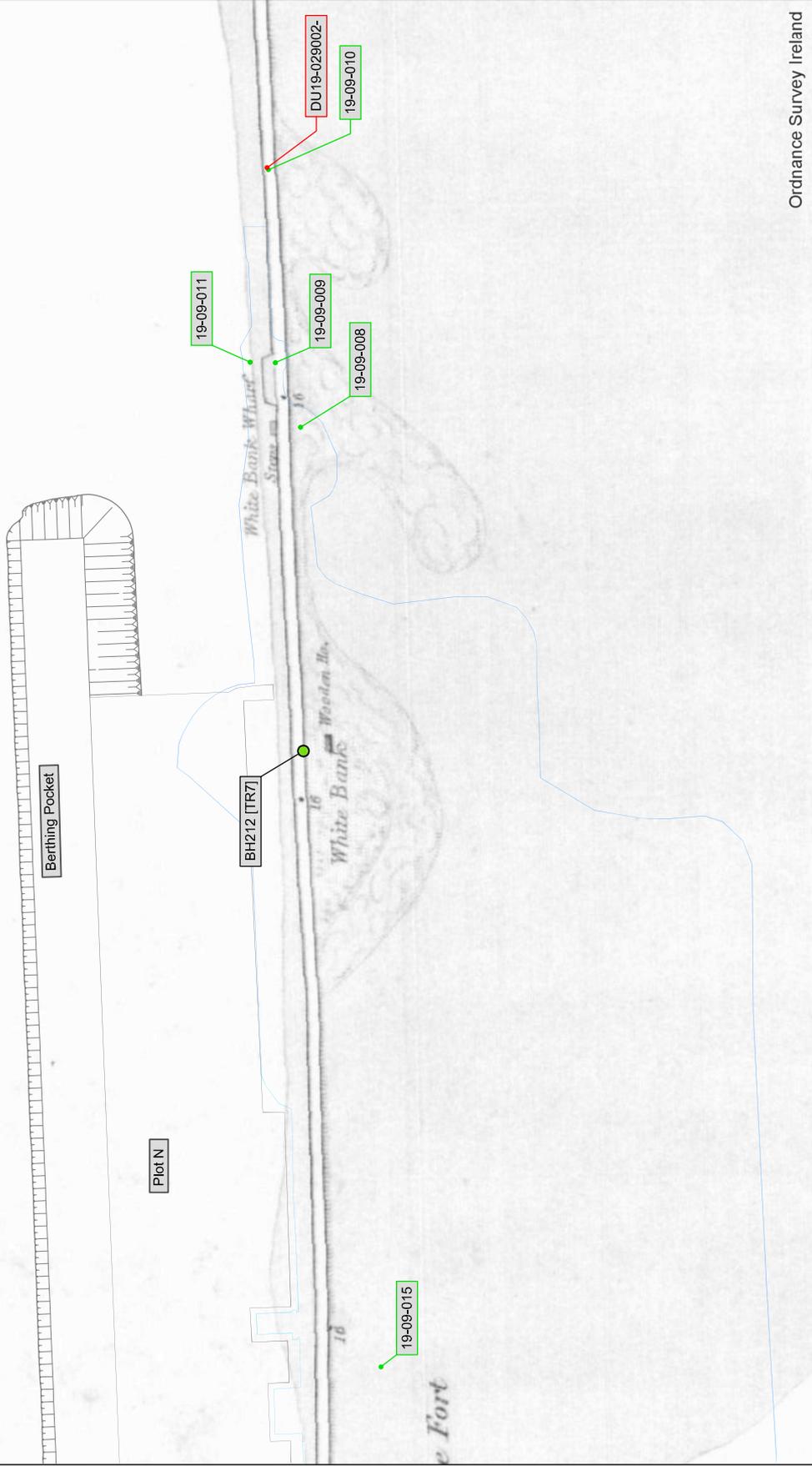
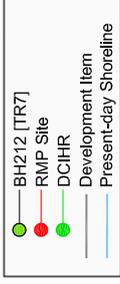


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Notes
Map Source: OS Historic Map Archive - Tailte Éireann.
[RMP locations - NIMS map viewer]
[DCIHR locations - HeritageMaps.ie map viewer]



Job/Exc No. 22E0007, 22D0001	Compiled by R.Bangenter	CAD reference 3FM_SL_Works	Client RFS/ Dublin Port Company (DPC)
Date 21.06.23	Scale 1:2000	Drawing No. Figure 4	Project Dublin Port, 3FM Project

Title
Figure 4 - OS First Edition Map (1837) with location of BH212 (TR7), surrounding Cultural Heritage Assets, and present-day shoreline superimposed.

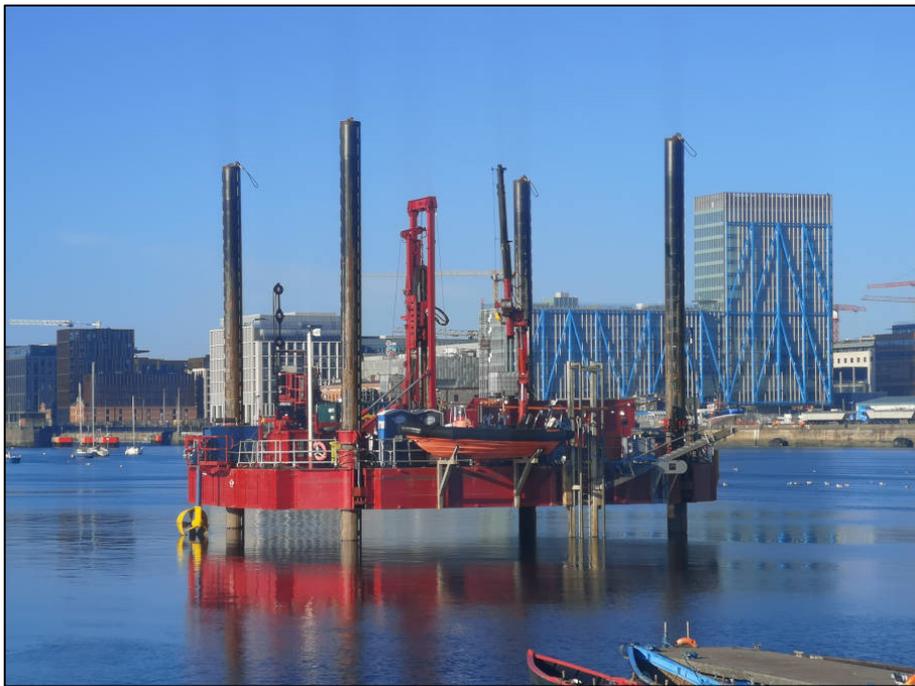


Plate 1: The Fugro *Aran 120* on position at Marine Borehole BH-S-05.



Plate 2: Example shot of the sampling of gravels (BH-TC-02).



Plate 3: Example shot of visual inspection of samples taken by Fugro's Geotechnical engineers.



Plate 4: Example shot of top of a thin wall steel tin (UT inspected).



Plate 5: Example shot of SPT testing and sample inspection.



Plate 6: Natural brushwood from BH-S-04 at a depth of -7.5m to -8.0m



Plate 7: Example of peat recovered from BH-S-04 at a depth of -8.5m.



Plate 8: White glazed pottery (Find 01) recovered from between -1m to -1.5m in BH-S-03.



Plate 9: North-facing view of the southern side of the Great South Wall, Trench 7 (BH-212).



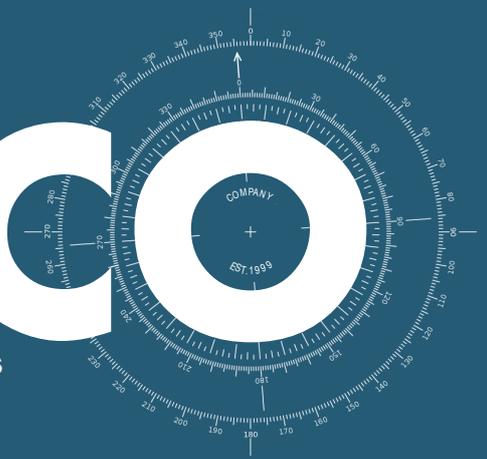
Plate 10: Overview photo of battered face of the sea-wall, Trench 7 (BH-212).



Plate 11: Cable percussion rig setup at BH-212 (Trench 7) on the landward side of GSW.

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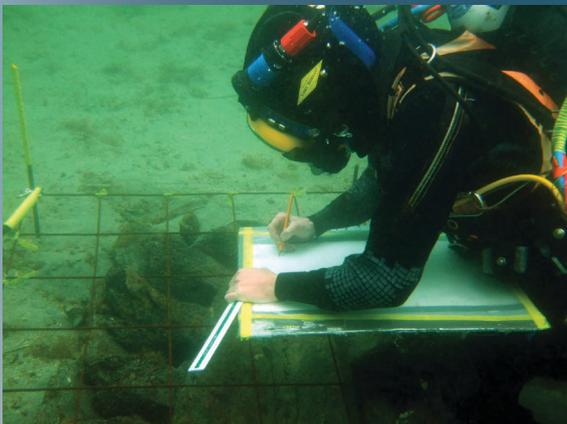


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