

Environmental Impact Assessment Report

Appendix 16.5

Volume 3 Part 8

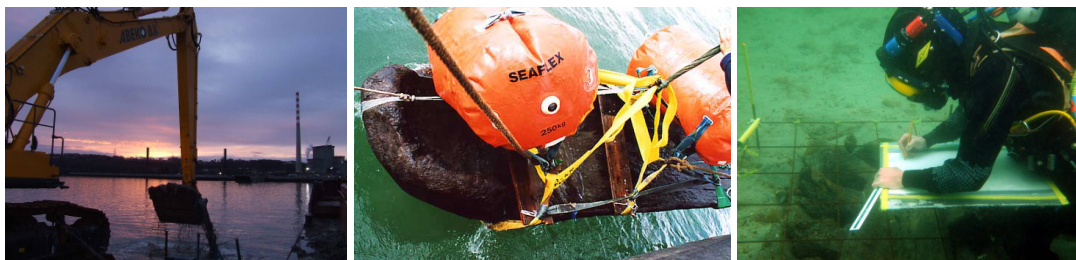




**Underwater Archaeological Impact Assessment (UAIA)
ADCOCO Areas 1-4, River Liffey, Dublin Port**

**Dublin Port 3FM Project
Project Reference CP1770_021**

23D0037, 23R0148





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Final Report
Client
Project Director

29 May 2024
RPS for DPC
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LIST OF ABBREVIATIONS

| | |
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| ADCO | The Archaeological Diving Company Ltd |
| ABR | Alexandra Basin Redevelopment Project |
| ACA | Architectural Conservation Area |
| CMP | Conservation Management Plan |
| 3FM | Third and Final Masterplan |
| DCIHR | Dublin City Industrial Heritage Record |
| DHLGH | Department of Housing, Local Government and Heritage |
| DGPS | Differential Geographic Positioning System |
| DPA | Dublin Port Archives |
| DSV | Dive Support Vessel |
| GNSS | Global Navigation Satellite System |
| GSW | Great South Wall |
| HCS | Heritage Conservation Strategy |
| HWM | High Water Mark |
| ING | Irish National Grid |
| ITM | Irish Transverse Mercator |
| LWM | Low Water Mark |
| MP2 | Masterplan 2 |
| E | Easting |
| N | Northing |
| NGR | National Grid Reference |
| NIAH | National Inventory of Architectural Heritage |
| NWQE | North Wall Quay Extension |
| OD | Ordnance Datum |
| OS | Ordnance Survey |
| RAS | River Access Steps |
| RMP | Record of Monuments and Places |
| RPS | Record of Protected Structures |
| RTK | Real-time Kinematic Positioning |
| SI | Site Investigation |
| SID | Strategic Infrastructure Development |
| SSDE | Surface Supplied Diving Equipment |
| SMR | Sites and Monuments Record |
| UAIA | Underwater Archaeological Impact Assessment |
| UAU | The Underwater Archaeology Unit |

EXECUTIVE SUMMARY

The Archaeological Diving Company (ADCO) Ltd. was appointed by RPS Ireland, consulting engineers on behalf of Dublin Port Company (DPC), to carry out an Underwater Archaeological Impact Assessment (UAIA) across the underwater and intertidal footprint of the proposed 3FM Project (ADCO Areas 1-4). This work included assessment of a series of side-scan sonar targets (SS_01 – SS_17), selected for underwater inspection, following archaeological interpretation of the data arising from a Marine Geophysical Survey of the in-water extent of the proposed development.

The 3FM Project represents the third and final phase of Dublin Port's Masterplan 2040, following on from the preceding Alexandra Basin Redevelopment (ABR) and Masterplan 2 (MP2) projects. This strategic infrastructure development (SID) is to conclude large-scale development within the port estate, facilitating the port's ultimate and final capacity by 2040. The project comprises a number of components, including:

- Creation of a new Southern Port Access Road (SPAR), to include road, bridge, and revetment structures.
- New Ro-Ro Terminal (South Bank Quay) to be constructed at the location of existing Berths 42-45.
- Construction of a new Container Terminal, comprising of an:
 - Export transit area (Plot N), encompassing the existing Berth 48/Oil Jetty area.
 - Import transit area (Plot O), located on the south side of Poolbeg Peninsula.
 - Lolo terminal (Plot L), located at Berth 46 and Berth 47.
- Dredging of a Waterside Turning Circle (325mØ) off Pigeon House Harbour.
- A series of Community Gain initiatives implemented as part of the project.

Advance Marine Site Investigation (SI) for the project has been completed (February 2023). This work was subject to Archaeological Monitoring by ADCO, under licence numbers 22ER0007, 22D0001, and 22R0003. The monitoring work, which did not identify any distinct layers of archaeological potential, is reported upon separately.

The UAIA comprised systematic visual inspection of the in-water and quayside/foreshore extent of the proposed development. The assessment sought to record riverbed/seabed topography, assess the potential of the submerged and intertidal deposits to retain archaeological material, and identify any additional features/structures of archaeological or historic significance that are present. This work also included detailed recording and laser-scan surveys of the following items:

- North Wall Quay Extension (NWQE), at the proposed location of the SPAR Bridge.
- Exposed sections of the Great South Wall (GSW), including any associated features/structures, falling within the development footprint.

A wider, terrestrial, walkover survey has also been completed and will be reported upon as part of the Cultural Heritage Chapter of the forthcoming project EIAR.

The majority of the onsite archaeological work was carried out between 3rd-9th May 2023, with some additional laser-scanning of the GSW (within ESB lands at Poolbeg) being undertaken on the 16th and 17th May 2023. The UAIA was carried out under licence from the DHLGH; licence numbers 23D0037 and 23R0148.

The UAIA report, based on the current level of information available, recommends that further onsite archaeological assessment of the underwater/intertidal footprint of the development, in advance of construction is not required. However, it is recommended that some additional (localised) archaeological recording of the GSW is undertaken post-consent/pre-construction; focussing upon the three (3) access route locations that lead onto the proposed quay development within Plot N.

Archaeological monitoring of all ground/intertidal/riverbed/seabed disturbances during construction is to be undertaken, by suitably qualified and experienced maritime archaeological personnel, with the proviso to resolve fully any archaeological material observed at that point.

Particular attention should be paid to the removal of masonry from the North Wall Quay Extension (including any impacts to the adjacent *campshire* area) at the proposed SPAR Bridge tie-in location, allowing additional detailed recording to be carried out (as required). This work should include assessment and full recording of the internal fabric of the quay structure, as/when it becomes exposed. In addition, any quayside masonry, or associated fixtures/fittings (e.g. wrought iron mooring hoops/hooks), that are to be removed as part of the development should retained and subject to additional recording.

Engineering interventions to the GSW are not envisaged as part of the project. Moreover, an exclusion zone, surrounding the sea-wall, has been included within the design for the development of Plot N. However, in the event that significant direct and/or secondary impacts to the GSW, including any associated features, are to arise, then additional pre-impact archaeological mitigation at those locations may be required. In addition, Archaeological Monitoring of any construction-phase works located in proximity to the GSW is recommended, with particular attention paid to the three (3) proposed access points; comprising the Main Site Access, Blue Light Access, and Jetty Access.

The information presented in the UAIA report will contribute to the Cultural Heritage Chapter of the project EIAR, with the full report included as an Appendix to that document.

The recommendations in the report are subject to the approval of the National Monuments Service at the Department of the Housing, Local Government, and Heritage (DHLGH).

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1.0 INTRODUCTION

The Archaeological Diving Company (ADCO) Ltd. has been appointed to the 3FM project by RPS Ireland, consulting engineers on behalf of Dublin Port Company (DPC). The 3FM project constitutes the third and final phase of Dublin Port's Masterplan 2040. ADCO was also appointed project archaeologist to the two previous phases of port infrastructure development arising from the Masterplan, comprising the Alexandra Basin Redevelopment (ABR) project (2015-2020) and the ongoing Masterplan 2 (MP2) project.

ADCO contributed to the Construction Environmental Management Plan (CEMP) for the above projects and devised a series of corresponding Archaeology Management Plans (AMP). Moreover, ADCO recently led a multidisciplinary team, on behalf of RPS for DPC, in the realisation and delivery of the Dublin Port Heritage Conservation Strategy 2024, a document that seeks to evaluate and quantify the maritime cultural and industrial landscape present with the port estate.¹

The current archaeological work focuses on the underwater and intertidal footprint of the proposed 3FM project and has been conducted as part of the pre-planning and EIAR requirement for the project (Figure 1). The UAIA provides a detailed record of all cultural heritage features present therein, along with assessment of any primary/secondary development impacts to same. In addition, it assesses the potential of the submerged/intertidal deposits to retain archaeological material and records existing riverbed/seabed topography. It also includes assessment of a series of seventeen (17) side-scan sonar targets identified for underwater inspection (ADCO Targets SS_01-SS_17).²

The UAIA was undertaken across four (4) underwater/intertidal areas and included the following items (Figure 2):

Area 1 (SPAR Bridge/Revetment)

- Underwater assessment of the riverbed across the footprint of the proposed bridge structure.
- Inspection of the quay-wall, *campshire*, and any associated features present, extending across an 80m section of the North Wall Quay Extension (NWQE).
- Detailed recording (laser-scan elevation) of the quay wall, extending 30m beyond the proposed impact area associated with the bridge tie-in location.
- Intertidal survey, south side of the river, along the route of the proposed access road.

¹ Dublin Port Heritage Conservation Strategy, Dublin Port Company, June 2023.

² The 3FM Marine geophysical survey, completed under licence number 22R0287, included multibeam bathymetry, side-scan sonar, magnetometry, and sub-bottom profile survey. The survey was carried out, at ADCO's request, by Hydromaster Ltd.

Area 2 (Turning Circle)

- Underwater assessment of riverbed adjacent to Pigeon House Harbour and nearby Sludge Jetty.
- Inspection the two (2) sections of quay-wall, forming entrance to Pigeon House Harbour, and any associated features present.
- Detailed recording (laser-scan elevation) of the harbour entrance quays and associated features.

Area 3 (Pigeon House Harbour)

- Underwater/intertidal assessment of the tidal and sub-tidal areas comprising the bed-level of the harbour.
- Walkover inspection of the upper surface of the adjoining quaysides.
- Recording and isometric laser-scanning of the harbour area.

Area 4 (Plot N, Poolbeg)

- Underwater/intertidal assessment of the footprint of the proposed container terminal (Plot N) located adjacent to the ESB power generation station at Poolbeg.
- Inspection of the Great South Wall (GSW) and any associated features present.
- Detailed recording (laser-scan elevation) of the GSW and any associated features.

The above survey work was position-fixed using Total Station and GNSS (RTK) recording, with the resulting data referenced to Irish Transverse Mercator and Malin Head Ordnance Datum.

The archaeological work was carried out in accordance with Section 5 of the National Monuments Act (2004 Amendment) by a team of underwater archaeologists and a certified surveyor on the 3rd-9th May 2023, with some additional laser-scanning taking place on the 16th-17th May 2023. The UAIA was carried out under licence from the DHLGH; licence numbers 23D0037 and 23R0148.

The UAIA report presents the following: a desktop review of the development area (Section 3.0); the findings from the onsite work (Section 5.0); the methodology applied to that work (Section 4.0); assess the level of impacts arising from the proposed development (Section 6.0); and makes general recommendations for future archaeological mitigation associated with the development (Section 7.0). An outline of the 3FM project is provided below in Section 2.0.

2.0 PROPOSED DEVELOPMENT³

The 3FM project comprises significant development to port land on the south side of the River Liffey, focussing on north side of Poolbeg Peninsula (see Figure 1). While the project includes

³ The following details are based on information presented within the 3FM Design Stage 2a Reports provided by RPS.

significant inshore development, the following section is primarily concerned with development items that relate to the underwater, intertidal, and immediate foreshores areas, namely: the Southern Port Access Road (SPAR) and associated bridge structure, Plot K (Berth Nos. 42-45), the Turning Circle (off Pigeon House Harbour), and Plot N (Berth No. 48/Oil Jetty area).

1. Southern Port Access Road (SPAR)

The proposed access road is located on the southern bank of the River Liffey, extending between the existing Tom Clarke (East-link) Bridge (to the west) and Poolbeg (Marina) Yacht and Boat Club (to the east). The road will run alongside the existing East Link Road and encompass an area that currently comprises intertidal foreshore. A new bridge, measuring c. 200m in length by 16m in width, will link the proposed access road to the north side of the River Liffey, landing on the North Wall Quay Extension at Berth No. 18.

The SPAR is to be supported by a revetment, constructed alongside the existing rock-armour for the East Link Road. The revetment will be formed using a stone-fill with rock-armour facing. The revetment slope will be constructed at a gradient of 1:1.5. Dredging of the intertidal foreshore is required to ensure a stable stratum from which the revetment structure can be built. It is likely that the removal of soft deposits from this area will be to a depth of c. 3m, with dredging extending northward from the base of the revetment (toe) by 5m. The volume of material to be dredged from this area is anticipated to be in the region of 50,000m³. As part of this endeavour, the adjacent Poolbeg Marina will also be subject to dredging, reducing the bed-level of the marina area to between -2.0mCD and -3.0mCD.

2. Plot K (Berth Nos. 42-45)

Plot K is situated on the south side of Dublin Port, opposite Alexandra Basin East. The southern boundary of the site is formed by the proposed new and redeveloped roadways. The existing quay edge, forming Berth Nos. 42-45, constitute the northern boundary of the site. The line of the Great South Wall passes through the site and a 126m-long section remains visible. The proposed redevelopment of Plot K involves the conversion of the existing Lo-Lo terminal (MTL Container Terminal) to a new Ro-Ro facility. The scope of the design includes the following key elements:

- Demolition of the existing nib (breakwater-caisson) structure at eastern end of Berth No. 45.
- Localised demolition of existing caisson structure to facilitate the installation of a new bespoke link-span and compact double ramp.
- Re-fronting of Berth 45 and 'cranked' section of Berth No. 44, to tie in with the existing sheet pile re-fronting of the berth (c. 295m long section).
- Potential requirement for localised repair works to undermined caissons alongside Berth No. 41.
- Dredging to provide 50m wide berthing pockets:
 - -11mCD depth at the western berth and

- -8.7mCD depth at the eastern berth.
- Installation of scour mattresses at the eastern end of Berth No. 45, positioned along the existing caisson face (at the location of ESB cables and intakes).
- Provision and installation of quay furniture (fenders, bollards, ladders, grab-chains etc.).
- Re-surfacing of the existing footprint of Plot K to accommodate trailer parking, general circulation, and container stacking in dedicated areas.

Plot K do not form part of the UAIA, the area comprising modern reclamation bounded by a sheet-pile quay wall. In addition, the berthing pockets have been subject to regular maintenance dredging, removing any inherent archaeological potential that may have existed for the adjacent riverbed.

3. Turning Circle

The proposed turning circle is located within the navigation channel, positioned between Berth No. 49 (to the north) and the 47A hardstand area/existing Sludge Jetty (to the South). This development item will require the demolition of the sludge jetty and removal of the northeast corner of the hardstand area. The main components of this development item are as follows:

- Installation of a steel-pile retaining wall along the channel side boundary of the Berth 47A hardstand area. Note, this work is separate to the 3FM project and is to be completed as part of the proposed Codling Wind Park; a facility which will occupy the hardstand area.
- Construction of 2nr tern protection structures (Dolphins).
- Demolition of the existing sludge jetty.
- Dredging of the turning circle to -10mCD and formation of corresponding side slopes.
- Construction of rock armoured revetments.
- Extension of the existing Irish Water culvert to allow flow through/over new revetment.
- Extension of the revetment, above seabed level, to protect the masonry wall/quay forming the west side of Pigeon House Harbour.

4. Plot N (Berth No. 48/Oil Jetty Area)

Plot N is located on the south side of the navigation channel, immediately adjacent to the ESB Power Generation Station (Poolbeg) and the NORA Oil Storage Terminal (Figure 3). The Great South Wall (GSW) forms the southern boundary of the development area. Plot N comprises construction of a new quay-wall, the dredging of an adjacent berthing slot, reclamation of the existing foreshore, and construction of new container storage/handling areas and operational buildings/associated structures. The key components of this development item are listed below:

- A quay structure measuring approximately 650m length x 125m in width.
- A working area (reclaimed/infilled foreshore) incorporated within the quay structure.
- 3nr access structures (Main, Blue Light, and Jetty).
- Dredging of a berthing pocket to -13mCD.
- Demolition of the existing Oil Jetty.
- Demolition of the existing ESB Jetty.
- NORA Oil pipeline diversions.
- Construction of new jetty and dolphin structures.

- Provision of maintenance and office buildings.
- A surface water drainage system.
- Potable and non-potable water system.
- Entrance works, including automated entrance barriers.
- Boundary fencing including ISPS, visual barrier and vehicle restraint systems, etc.

An open-pile substructure will form the quay frontage and those areas outside of the reclamation area; tubular steel piles ranging between 1626mmØ - 1219mmØ being used. The piles are to be installed on a grid pattern, with an approx. spacing of 6m x 6m. A composite concrete deck-slab, comprising both precast and *insitu* concrete sections, will form the surface component. The reclamation area has been designed as an infilled area retained by a combi-wall structure, composed of an alternating pattern of tubular and sheet piles elements.

Plot N runs parallel to the GSW and, as such, an exclusion zone (min. 6m width) is to be included along the length of the wall; ensuring it is protected from the proposed construction works.⁴ As a result, the proposed access structures are to span both the exclusion zone and the GSW itself.

The three (3) proposed access structures are as follows:

- Main Site Access, located at the southeast corner of the development area.
- Blue Light Access, a single lane emergency access that is centrally located at the existing Oil Jetty location.
- Jetty Access, located at the southwest corner of the development area, allowing access over the ESB outlet channel to an approach arm to the relocated ESB Jetty.

The Main access point will comprise a three-lane bridge structure, spanning above the GSW and an adjacent (masonry) slipway. The access bridge will require the insertion of a single row of tubular steel piles within the proposed exclusion zone. These piles will not impact the aforementioned historic structures. It is anticipated that the main spanning-element will comprise precast, pre-tensioned, 'TY' bridge beams, supported upon a reinforced concrete abutment. The abutment structure is to be offset 3m from the landward side of the GSW.

The Blue Light (emergency) access will be located at the location of the exiting Oil Jetty access/approach arm; this structure having already impacted the GSW. As such, it is proposed to locally extend the main deck structure to abut the GSW and provide the required access. This will be achieved by cantilevering the deck to meet the existing abutment level. No additional impacts to those already associated with the construction of the Oil Jetty are envisaged at this location.

⁴ Included in the project design following consultation with Dublin Port's Heritage Team, comprising ADCO (Archaeology), Southgate Associates (Conservation Engineers and Heritage Consultants), and MOLA (Architecture).

Jetty access is to comprise an approach bridge, measuring approximately 23m length x 7.5m width, which is to span the GSW and associated exclusion zone. As per the main assess bridge, the jetty bridge is to comprise precast, pre-tensioned, 'TY' beams for the spanning element. These beams will be supported on a reinforced concrete abutment. It is envisaged that the bridge will tie into existing road levels, located behind earthworks (earthen bund) for the adjacent Oil Storage compound. A slope/gradient of approximately 1:20 will be required to make this transition.

2.1 Marine Site Investigation

A programme of Advance Marine Site Investigation (boreholes) was undertaken to inform the preliminary design of the various infrastructural elements of the 3FM project (as detailed above). The SI works comprised thirty-two (32) geotechnical exploratory boreholes (Figure 4); drilled using cable percussive/rotary core methods. This work was undertaken to determine the various stratum types that are present across the development footprint, thus informing appropriate construction design.

The Marine SI works were carried out by Fugro, who also carried out geotechnical works for the MP2 project. The marine boreholes ranged between 100mm-200mm in diameter and extended to a maximum depth of c. 35m below existing bed-levels. Samples were retrieved, at regular vertical intervals (typically 1.5m to 2.5m) from the upper strata, and were retained for sediment identification/classification and laboratory testing.

The Marine SI was subject to Archaeological Monitoring by ADCO, under licence numbers 22E0007, 22D0001, and 22R0003. The monitoring work, which did not identify any distinct layers of archaeological potential, has been reported upon separately.⁵

3.0 RECEIVING ENVIRONMENT

This section provides a concise account of the heritage asset surrounding the four assessment areas (ADCO Survey Areas 1-4; see Figure 2). For a detailed account of the wider heritage landscape present, the reader is directed to the EIAR Chapter prepared for the project.⁶

3.1 Overview

The River Liffey rises at an elevation of 540m above sea level near Kippure in the Wicklow Mountains, c. 20km south of Dublin. The river forms a large arc as it flows westward, then

⁵ Rex Bangerter and Dominick Gallagher, Archaeological Monitoring of Geotechnical Site Investigation (Marine Boreholes) for the 3FM Project, 22E0007, 22D0001, 22R0003, ADCO, August 2023.

⁶ Vol. 2, Chapter 16, Cultural Heritage (Including Industrial and Archaeological), ADCO for RPS/DPC.

northward, and finally eastwards through Dublin City to its confluence with the Irish Sea in Dublin Bay. It has a drainage catchment area of just over 1380 km² and flows over a range of different geological formations including granite, sandstone, sandstone-limestone, and limestone.

Extensive reclamation of the river floodplain has been undertaken since at least the seventeenth-century. This adaptation of the natural environment was extended to the river as it flowed through the city; the river currently being delineated by a series of eighteenth and nineteenth-century quayside structures.

Maritime activity within the River Liffey is documented from the eighth-century onwards and it is clear that the area has a long history of human landscape intervention, adapting the topography of the river and wider estuary to conditions favourable for navigation and anchorage of vessels within the bay area.

City Centre excavations at Winetavern Street and Wood Quay uncovered large wooden revetments dating to around 1200AD. These structures are thought to form part of an early reclamation and dockside area at Wood Quay.⁷ In addition, extensive seventeenth to nineteenth-century land reclamation was also undertaken, dramatically changing the landscape along the river's mouth. Indeed, this process, coupled with the eastward shift in bridge construction across the Liffey, resulted in the movement of port and shipping activity from the city centre to the easternmost parts of the river.

One of the earliest maps depicting the '*Harbour of Dublin*' dates to 1654. This map, by William Farrand and William Starkes, was subsequently incorporated into the Down Survey of Ireland (1655-56). While the map is not to a scale that provides significant cartographic detail, it does include a number of noteworthy items relating to the topography of bay. An area of dry-land, annotated '*Lantafe Isle*' (Island of Clontarf) is included. In addition, Ringsend point is depicted, as are a number of sailing vessels entering the mouth of the Liffey. Out to sea, a large expanse of sand is shown, forming a sandbar that extends across the entrance to Dublin Bay. This natural feature, known as the Dublin Bar, frequently proved perilous to shipping. A permanent engineering solution to this navigation hazard was implemented with the construction of the North Bull Wall in 1825. The use of sea walls to provide natural scouring of the approach channel was a hydrographic solution first proposed by Capt. Bligh,

⁷ Halpin, Andrew, *The Port of Medieval Dublin*, Four Courts Press, Dublin, pp.179-80.

following his survey of Dublin Bay in 1800; Bligh was tasked by the Admiralty to report on the Bay, the harbours within it, and the problems of shallowness on its approaches.⁸

Other early maps of Dublin, including Bernard De Gomme's Map of 1673, show a largely unaltered estuary environment (Figure 5A), indicating a series of rivulets and sand flats that would have proved demanding to the safe passage of ships.⁹ In addition, Captain Granville Collin's map of 1693 depicts a series of sub-tidal, estuarine, pools that facilitated anchorage during low-water tide cycles (Figure 5B); these features representing dynamic, shifting areas within the channel that required considered navigation.¹⁰ Furthermore, these anchorages would have been prone to the vagaries of the weather, in particular to any easterly to south-easterly winds. The sub-tidal areas annotated on Collin's map are as follows: 'Clontarf Poole', 'Salmon Poole' (located between Poolbeg to the entrance to Alexandra Basin), 'Poole Beg' (located to the east of Pigeon House), and the 'Iron Poole' (located between the Half Moon Battery to Poolbeg Lighthouse).

In contrast, it is evident when viewing the later mapping, such as John Roque's maps from 1756-57, that subsequent and extensive interventions to the estuarine foreshore have taken place. Prominent amongst these undertakings was the construction of the North Wall (1710-1718), facing the river channel, and the East Wall (1718-1729); running northwards along the line of the present day East Wall Road.¹¹ These constructions provided a tidal barrier behind which the land could be extensively reclaimed, a process that lasted until the early part of the nineteenth-century and significantly extended the landmass on the north side of the Liffey.

The historic reclamation process has been highlighted by excavations undertaken along Ormond Quay and Custom House Quay. These excavations produced evidence of seventeenth-century reclamation deposits, with eighteenth-century structures built above. Moreover, excavations at the site of Building C, Spencer Dock, North Wall Quay (2004:565) identified three principle phases of activity.¹² These included a series of Late Mesolithic fish traps located on the old shoreline of the Liffey channel, artefacts from the eighteenth and nineteenth-century reclamation of that area, and structures from the nineteenth and twentieth-century development of that reclaimed land.

⁸ Bligh being appointed by the Admiralty to report on the Bay, the harbours within it and the problems of shallowness in the approaches to Dublin; Gerard Daly, 'Captain Bligh in Dublin, 1800-1801', *Dublin Historical Record* 44.1 (1991): 20-33, at p. 23.

⁹ Bernard De Gomme, *City and Suburbs of Dublin*, 1673.

¹⁰ Cap. Grenville Collin's 'A Map of Dublin Bay, from Portmarnock to Dunleary', 1693.

¹¹ John Roque, 'A Survey of the City Harbour and Environs of Dublin', 1757.

¹² McQuade, Melanie, *Building C, Spencer Dock, North Wall Quay, Dublin*, in Isabel Bennett (ed.), *Excavations 2004*, (Dublin, 2007), 128-9.565; McQuade, Melanie, 'Gone Fishing', *Archaeology Ireland*, (2008), 22 (1), 8-11.

Coordinated marine works, under the auspices of the Ballast Board, to improve navigation within the bay were also undertaken in the eighteenth-century. John Roques's map of 1757 charts the beginning of this work (Figure 6). Most notably, the construction of the '*The South Wall*' (DU18-066; Ballast Office Wall) and '*The Piles*'; the latter being an early attempt (built 1731) to secure the navigation channel with a timber breakwater. This endeavour formed a precursor the Great South Wall, completed in 1796, which runs from Ringsend Point to Poolbeg Lighthouse.

The Ballast Board was superseded by The Dublin Docks and Port Board in 1867, which began a programme of development works that included a new riverside quay (the North Wall Extension), deep-water berths, and the construction of Alexandra Basin. Alexandra Basin, commenced in 1871 and partially completed by 1885, was the principal work of Bindon Stoney, chief engineer to Dublin Port. To avoid the necessity of costly cofferdams and pumping, the lower sections of the deep-water quay walls were formed of pre-cast concrete blocks, weighing up to 350-tons. The machinery for handling the blocks, floating-hoists, and the large diving bell for preparing the foundations were all designed by Stoney. The construction aroused worldwide interest among the engineering community.

Admiralty charts from the late 1880s, although primarily focused on providing navigational detail (depth-soundings, etc.), show extensive reclamation of sand-flats on the north side of the channel, where the North Wall Quay Extension (NWQE) forms the southern extent of Alexandra Basin (Figures 7-8). The NWQE was completed in the early twentieth century (1922-31) by the port's chief engineer Joseph Mallagh, following on from the previously discussed works undertaken by his predecessor, Bindon Blood Stoney.

The North Bull Wall, The Great South Wall, Pigeon House Fort, and the settlement at Ringsend, now well-developed, are also depicted. However, it is the Ordnance Survey First Edition map (1837) that provides the first metrically accurate maps of Dublin and its harbour area (Figures 9-11). It shows a concentration of well-established, maritime related infrastructure and associated services for the North Wall area. This map edition also depicts the construction of a '*Light House*', Harbour Master's Office, and '*Patent Slip*' along the seaward side of East Wall road, signalling a shift in port interests eastward, into what was to become Alexandra Basin.

Upon the establishment of Alexandra Basin, limited port development was to take place, until the early part of the twentieth-century when a number of additional quays and jetties were added, including: the construction of Alexandra Quay in the 1920s (placed along the north side of Alexandra Basin); and the addition Alexandra Quay East, Ocean Pier, and a number of Oil Jetties, all of which were completed by 1955. A new phase of reclamation works was

initiated at this time, and pushed the boundaries of the port northwards, along the East Wall, towards the Clontarf shoreline. This second phase of reclamation works roughly defines the current extent of Dublin Port.

3.2 Cartographic Information

A series of historic maps provide valuable insight into land use and maritime development within the port area from the eighteenth-century onwards. While the preceding section has discussed some of this mapping in general terms, the following section provides a detailed account to four historic maps (with specific reference to the areas under assessment), namely: John Roque's Maps of 1756 and 1757, the Ordnance Survey (OS) First Edition Map of 1837, and the Ordnance Survey (OS) 25-inch Edition Map of 1906-1909.

John Rocque, 1756/1757 map editions.

Two detailed maps of Dublin were produced by John Rocque in the mid-eighteenth century.¹³ Both map editions show extensively reclaimed areas of river estuary, with increased use/development of water-frontage along the river. Aston Quay, Georges Quay, and Sir John Rogerson's Quay delineate the south side of the river, with Bachelors Walk and the North Wall Quay opposing. In addition, large scale reclamation works are evident on the north side of the estuary with the construction of the North Wall and the East Wall, allowing for extensive reclamation of the area in the seventeenth and eighteenth centuries.

The 1756 map, which does not extend into the bay area, depicts an abundance of vessels accessing the city's quays, alluding to the concentrated maritime use of the river at that time (Plate 1). These appear to comprise small to medium sized, shallow-draft, sailing vessels (predominantly single-masted) and a series of rowed ferries/tender boats.

The river area is depicted, prior to construction of the Grand Canal Docks, at a time when little or no development had taken place on the southern side of the Liffey. According to this map, the eastern side of the River Dodder was largely undeveloped, no housing or warehouse plots being depicted (present-day location of Sir John Rogerson's Quay). However, the mapping does show a quay wall at this location, constructed (in 1716) to prevent flooding and allow reclamation of the adjacent mudflats, a process of reclamation that is clearly evident by 1760. Greater development is depicted for the north side of the Liffey, the river channel being delineated by a quayside that runs the length of the North Wall, behind which the reclaimed land (*The North Lotts*) has been subdivided by the insertion of a grid-iron street pattern, annotated with the following (north-south orientated) streets: '*Commons Street*', '*Guild Street*', '*Wapping Street*', and '*Fish Street*'.

¹³ John Roque, '*Exact Survey of the City and Suburbs of Dublin*', 1756 and '*A Survey of the City Harbour and Environs of Dublin*', 1756.

Moving eastward, John Roque's later map of the harbour area provides a detailed view of the estuary at that time (see Figure 6). The main navigation is depicted as a broad channel, measuring c. 600m at its mouth, and c. 160m on its approach to Ringsend. A number of vessel types are depicted using the channel. These range from lateen-sailed *sloops* and small *brigs* (fishing vessels and coastal traders), accessing the upper channel opposite '*Browns Patch*', to larger two and three-masted *brigs*, *brigatines*, *barques*, and *galleon's* (ocean-going vessels) moored mid-channel, between '*The Pacquet Moorings*' and the '*Clontarf Oyster Beds*'. As depicted on the earlier map, a range of tender vessels/ferries were most likely used to convey merchandise/cargo to and from these larger vessels to the city's quays.

The north of the channel is defined by intertidal sand-flats. A narrow, meandering, tributary extends northward from the main channel towards Clontarf Island. A second, larger channel provides access to Clontarf via Clontarf Pool. The area between these channels is annotated '*Browns Patch*'. A single structure is depicted on Clontarf Island, marked as '*the Island House*'. The island comprised a raised bar of coarse-sand and gravel that was vulnerable to coastal erosion.

Records show that in 1538 the island was leased by the Prior of Kilmainham, later falling under the jurisdiction of Dublin City when it was leased to the city recorder in 1621. In 1665, the City Council were concerned with the 'great peril and danger which might ensue to this city of Dublin' due to 'the infection of the Plague in the city of London' if persons 'of all sorts should be suffered freely to resort hither without control'.¹⁴ Two structures, known locally as the 'pesthouses', were placed on the Island in 1666 to quarantine merchandise and passengers arriving from overseas.

By the mid-1700s the island measured c. 450m length by c. 120m in width, however, today the island is barely visible at Low Water; its extent having been greatly reduced in 1844, following a severe south-easterly storm.

In contrast, two major engineering interventions, '*The South Wall*' (DU18-066; Ballast Office Wall) and '*The Piles*' are shown for southern side of the navigation channel. A boat-slip, annotated '*Macarels Slip*' is located roughly half-way along the South Wall. The sea-wall and timber breakwater depicted on this map were to form a precursor the Great South Wall, which runs from Ringsend Point to Poolbeg Lighthouse (completed in 1796).

The Great South Wall delineated the navigation channel, between Pigeon House and Ringsend, well into the twentieth century, at which point a container terminal (built 1974) and a toll-road for Tom Clarke Bridge (built 1984) buried much of the structure along this section

¹⁴ De Courcy, J.W., 1988, *Anna Liffey, The River of Dublin*, O'Brine Press, Dublin, p.55

(Plates 2-3).¹⁵ In addition, the industrial development of land (1970s onward) to the west of Pigeon House Harbour, would further bury parts of the GSW on its southern side.

Survey Area 1 is located adjacent to the sea-wall, at its western end. The other assessment locations (Survey Areas 2-4) are positioned towards the eastern terminus of the sea-wall, running east-northeast between the breakwater (to the south) and 'The *Pacquet Moorings*' (to the north).

The mouth of the harbour is demarcated by the '*West Buoy*' (to the north) and '*The Head of the Piles*' and an adjacent '*Light Ship*' (to the south) (Plate 4). A series of timber navigation marks are also included for the shallows, located on either side of the inner channel; four (4) to the south, between '*Ringsend Point*' and the terminus of '*The South Wall*', and five (5) shown to the north, between East Wall Quay and '*Clontarf Pool*' (Plate 5). The largest of these is shown at the juncture between the sea-wall and the breakwater, where it is depicted as a timber (tripod framed) flag-pole with rock-armour protection to its base.

OS First Edition Map (1837)

The OS First Edition map shows wide-scale development across the north and south sides of the River Liffey, depicting a similar ground plan and street layout to that of the present-day. No bridges or in-river structures are shown for the waterway, extending between Carlisle Bridge (built 1794 and replaced by O'Connell Bridge in 1880) and the river's mouth. Instead, transport across the river channel was serviced by two (2) ferries, one running between City Quay and Custom House Quay, the other between Sir John Rogerson's and the North Wall.

By the late 1700s a tradition of boat-building had been established along Sir John Rogerson's Quay and at Ringsend. This activity is highlighted by the construction of the Grand Canal Basin (1796), which included three substantial graving docks on the basin's east side. The Dublin Dockyard Company leased two of these docks between 1851 and 1881, subsequently being leased to the Ringsend Dockyard Ltd., who built/repared boats in the basin until the 1960s. However, despite the establishment of the Grand Canal Docks, it is clear from the First Edition map, that by the early-mid nineteenth-century, the main focus of maritime activity still remained on the north side of the river; extending between the Custom House and the East Wall.

Moving east, intertidal sand-flats dominate the north side of the estuary and a series of sub-tidal channels extend towards the Clontarf shoreline; including Clontarf Pool, now annotated '*The Pool*'. The recently built (1825) North Bull breakwater is also depicted; annotated '*New*

¹⁵ See Plate 8 of this report, aerial image of Dublin Port, dated 1933, which provides a clear view of the South Wall, Macarels Slip, and the adjacent intertidal foreshore prior to these developments.

Wall of Breakwater called The Bull Wall. It is shown extending c. 2.8km (southeast direction) from a point close to the Clontarf shoreline, at '*Cold Harbour*', to its terminus at the harbour mouth, opposite Poolbeg Lighthouse. The structure is accessed via a '*Wooden Br.*' that crosses a sub-tidal channel called '*Crablake Water*'.

On the south side of the harbour, the Great South Wall (DU18-066---/DU19-020002-) demarcates the channel; the sea-wall extending c. 2.8km east of Pigeon House Harbour, replacing the earlier timber breakwater (known as the 'The Piles') at that location.

In addition, Pigeon House precinct (DU19:027----) is shown in some detail, with a well-developed fort (completed in the early 1800s) protecting an adjacent harbour area (completed by 1793). The 'Pigeon House' was the first structure, following construction of the South Wall, to be built at this location; perhaps as early as 1760, within an area then known as 'Greens Patch'.¹⁶ It was to become a popular staging-point for passengers landing at Pigeon House Hole, part of the original Salmon Pool, and is said to have been named after its resident caretaker, one John Pigeon. Following the establishment of the Ballast Board in 1786, designs for a harbour were progressed and a hotel was also built (c. 1793), to the design of Robert Pool. The building was later to become an officer's quarters for Pigeon House Fort.

The harbour and hotel were commandeered by the military following the 1798 rebellion, remaining under temporary occupation until a formal undertaking to purchase of the hotel and harbour from the Ballast Board was completed in 1814. The precinct was then formalised, as detailed on the First Edition map, into a fortified harbour and associated buildings. The precinct functioned as military fort until 1897, at which point it was sold to Dublin Corporation, later becoming the site of the Pigeon House Generating Station in 1903. The station was run by the Dublin Corporation Lighting Committee, until it was acquired by ESB in 1929. It remained in operation until the 1960s.

Another fortification (DU19-028----), annotated '*The Half Moon or Five Gun Battery*', is also depicted on this map edition. The battery is positioned on the south side of the Great South Wall, at the present-day location of the Half Moon swimming area, some 827m west of Poolbeg Lighthouse. An associated '*Landing Slip*' is shown immediately adjacent, on the north side of the GSW.

The following sub-sections (Survey Area 1 and Survey Areas 2-4) reference specific cartographic details that surround the four areas under assessment, as depicted in Figures 9-11.

¹⁶ De Courcy, 1996.

Survey Area 1 (Figure 9)

Towards the downstream terminus of the North Wall, the OS First Edition map includes a lighthouse, associated port buildings, and a small slipway, positioned along the seaward side of the East Wall, where it is conjoined by the North Wall (Map Item 1). According to the map, the lighthouse, built c. 1820, was located a short distance to the northeast of the present-day entrance to Berth 18/NWQE; the proposed SPAR Bridge landing at a location c. 12m east of the terminus of the North Wall Quay, at a point c. 30m south-southeast of the mapped position of the former lighthouse.

To the north, a cluster of buildings, annotated '*Baths*', are sited at the junction between the East Wall road and Mayor Street (Map Item 2). In addition, a newly built '*Patent Slip*' is located along East Wall Quay, an area that was to undergo significant development (Alexandra Basin) in the mid to late 1800s (Map Item 3).

A nineteenth-century engraving, reproduced in *The Dublin Penny Journal* of 1834, provides a view of the North Wall Quay and lighthouse, looking from the south (Plate 6).¹⁷ It depicts a two-storey, masonry, lighthouse with large windowed beacon, surrounding gallery, and ornate cupola with weather-vain. The view includes c. 20m of the North Wall and part of the East Wall Quay, as it runs northward. A series of mooring rings are shown at regular intervals along the façade of both quay structures. In addition, a set of river-access steps are shown to the west of the lighthouse. In the distance (centre-left of picture), the aforementioned patent slip also appears to be included in the vista. A number of vessels are shown, including two small, (two-masted) sail ships, a ketch, and several rowing boats.

The '*South Wall*' (Map Item 4) is shown extending c. 2.2km from a small quay at Ringsend Point (Map Item 5), to a point on the west side of Pigeon House Harbour. The route of the SPAR and its associated revetment are located a short distance to the north of the sea-wall. Two (2) substantial '*Landing Slips*' are shown along its extent, one to the south, and one to the north (Map Items 6-7, respectively). To the south of the sea-wall, a dotted line (annotated '*Intended Wall*') alludes to intended future reclamation of the area, extending from Ringsend to the nearest of the aforementioned landing slips (Map Item 8).

A number of '*Rope Walks*' are also included on the First Edition map, situated on the east side of Ringsend (Map Items 9-10).

In channel, a series of seven (7) '*Buoys*', six (6) of which are opposing, are shown demarking the line (c. 1km) of sub-tidal navigation on approach to the city's quays (Map Item 11);

¹⁷ P. Dixon Hardy, *The Dublin Penny Journal*, 1834, Vol III, No. 121, p. 129.

indicating that the deepest part of the channel still remained on the north side the river at this time.

Survey Areas 2-4 (Figures 10-11)

Pigeon House precinct (DU19-027) is well represented on the OS First Edition Map; annotated '*Pigeon House Fort*'. The precinct is located to the south of Survey Area 2 (Turning Circle) and a short distance to the west of Survey Area 4 (Plot N). Survey Area 3 encompasses the present-day extent of the harbour, following reclamation of much of the basin area in the early 1900s.

The harbour basin is delineated on its channel side by a c. 330m-long (east-west) section of quay wall (Map Item 12). An almost right-angled return wall (running north-south) forms the west side of the harbour, measuring c. 95m in length.

Pigeon House Fort is located on the east side of the harbour and comprises a '*Barracks*', '*Officers Quarters*', magazine, armoury, and '*Hospital*'. A '*Rampart*' delineates the north-east corner of the fort area (Map Item 13). A boat '*Landing Slip*' is located at the southern terminus of this feature (Map Item 14). An entrance gate is located, immediately adjacent to this boat-slip, on the Great South Wall and is annotated '*Draw Br.*' (Map Item 16). Another entrance, annotated '*Gate*', is also positioned on the GSW, adjacent to the west-wall of the harbour basin (Map Item 16). An '*Ordnance Store*' is located c. 50m to the west of this entranceway (Map Item 17). An early-nineteenth century engraving of Pigeon House Fort depicts the fortification on its western approach, where a wooden (palisade) gate secures the entrance from the GSW (Plate 7)¹⁸. A number of sailing vessels are shown, moored alongside the quay-wall on the north side of the harbour area. The GSW, extending to Poolbeg Lighthouse in the distance, is also shown.

Moving east of Pigeon House Fort (c. 500m), a large sand bank, annotated '*White Bank*', abuts the south side of the GSW (Map Item 18), measuring c. 320m east-west by c. 100m north south in extent.¹⁹ A small '*Wooden House*' is located within this area. Further along the sea-wall, at the eastern limit of Survey Area 4, a landing area is indicated on the north side of the structure, annotated '*White Bank Wharf*' (Map Item 19). A set of associated access '*Steps*' is also marked upon the map, a short distance to the west.

¹⁸ Pigeon House Fort, c. 1824, Patrick Healy Collection, South Dublin Libraries, Local Studies Collection; image included in entry for RMP 23D019-027.

¹⁹ This natural feature, which built-up in the 1800s, was associated with a number of wrecking events and is referred to in DHLGH Shipwreck Inventory on a number of occasions.

OS 25-inch Edition Map (1906-1909)

The OS 25-inch map depicts continued development along the city's quays, and most significantly into the harbour area with the establishment of Alexandra Basin (Plate 8).²⁰ This constituted a marine infrastructure project which included substantial reclamation of the intertidal foreshore and was to permanently shift maritime traffic/trade to the mouth of the River Liffey, laying the foundations of present-day Dublin Port.

Alexandra Basin was formed by the construction of '*Tolka Quay*' to the north, a c. 750m-long '*Breakwater*' to the east, and the NWQE to the South. Alexandra Road provided access to a '*Chemical Manure Works*' and '*Oil Tanks*'. An entrance at the junction between Upper Sheriff Street and East Wall Road provided access the '*Port & Docks Board (Depot)*', a series of associated wharfs, a '*Shipbuilding Yard*', and the '*North Wall Graving Dock*' (Graving Dock No. 1). A '*Harbour Master's Office*' and '*Slip*' is also shown, located on the east side of the Alexandra Basin, immediately adjacent to east wall road. Further industrial development is also evident along the North Wall, focussed across land extending east from Commons Street. This development included a series of goods sheds and bonded stores, saw mills, iron works, and the establishment of a railway station, '*North Wall Station*'. Moving downstream, to the east of Fish Street (later renamed Castleforbes Road), the mapping shows extensive development of the waterfront area with the establishment of a '*Saw Mills*', '*Timber Yard*', '*Coal Yard*', and large '*Goods Station*'; the latter structure accommodating the transportation of goods offloaded via a crane-and-rail system that was situated at the terminus of North Wall Quay and along the NWQE.

To the south, there is continued reclamation of the foreshore to the east of Ringsend, behind the Great South Wall, the line of which is shown forming York Road, leading onto Pigeon House Road.

Survey Area 1 (Figure 12)

The OS 25-inch Edition Map depicts the '*North Quay Extension*' prior to its further extension in the 1920s, which added c. 90m of quayside to its terminus. The NWQE (as depicted on the OS mapping) measures c. 675m in length by c. 78m in width. Five (5) large, rectangular, goods sheds are present, with three (3) positioned on the north side, and two (2) on side the south of the quay area (Map Items 20-21, Plate 9). The structures terminus comprises a section of intertidal sandbank, retained between two (2) wing-walls that measure c. 33m (north side) and c. 72m (south side) in length. A lighthouse, annotated '*North Wall Lighthouse (White Revolving)*' is located immediately adjacent the south wing-wall, on its north side, c. 30m from its terminus (Map Item 22). As previously mentioned, a crane-and-rail system is

²⁰ General view of Dublin, Ireland, 1933; '*Oblique aerial photograph taken from west*', image number Xpw04329, Britain from Above.

shown, running from a '*Goods Station*' (Point Depot), located at the downstream extent of the North Wall Quay, to a '*Crane*' and '*Revenue Watch House*' located c. 560m along the NWQE (Map Item 23). In addition, a series of '*Mooring Posts*' run parallel to the quay-wall, positioned on both sides of the structure.

Two (2) sets of river access steps are depicted at the terminus of the North Wall Quay, where it conjoins with the NWQE (Map Item 24); these structures being located on either side of the present-day Tom Clarke (East-link) Bridge. The downstream set of steps has been catalogued in this report as RAS-01. Similar access steps are located upstream, where two (2) ferry services were in operation; one running between North Wall Quay and the terminus of Great Brittan Quay (crossing the Liffey), the other between Great Britain Quay and a small (unnamed) quay located at the terminus of York Road (crossing the mouth of the Dodder).

The SPAR Bridge will tie-into the NWQE, at point c. 30m to the east of Tom Clarke Bridge. The bridge will traverse the River Liffey, before turning eastward to run along the southern shoreline; across the lower reaches of the intertidal foreshore at that location, where the intertidal zone is depicted as measuring between c. 27m and c. 58m in width (Map Item 25).

On the south side of the Channel, the westernmost part of the GSW wall has been subsumed to form York Road and Pigeon House Road. A series of terraced houses ('*Bayview Terrace*') now occupy the reclaimed land to the south side of Pigeon House Road (Map Item 26). In addition, a new road, Cambridge Road, provides access from the centre of Ringsend to the terminus of York Road (Map Item 27). To the east, a sea-wall extends from '*Strasburg Terrace*' to the end of Pigeon House Road, behind which the foreshore has been reclaimed (Map Item 28). An intake pipeline, the '*South Wall Intake*' is located within this structure, a '*Siphon House*' being located on its northeast side and the '*Dublin Corporation Main Drainage Pumping Station*' (Ringsend Main-lift Pumping Station) a short distance to the east (Map Item 29).

Moving east, it is apparent that significant deposition has taken place on the south side of the GSW (Pigeon House Road), allowing construction of a '*Coastguard Station*' to the east of the pumping station; close to where an existing boat-slip (appearing as '*Macarels Slip*' on Roque's map of 1657) is located on the north side of the sea-wall (Map Item 30). An '*Isolation Hospital*', opened in 1907 as a tuberculous sanatorium, is also shown further to the east, c. 350m west of Pigeon House Fort.

Survey Areas 2-4 (Figures 13-14)

Two late nineteenth/early twentieth-century infrastructural projects were to re-shape Pigeon House precinct, both of which are well represented on the OS 25-inch Edition map (Map

Items 31 and 34). The first of these comprised a sewage processing facility, constructed shortly after Dublin Corporations acquisition of Pigeon House in 1897. The site is annotated '*Outfall Works (Dublin Corporation)*' and is depicted as a series of settling-tanks (sludge beds), eighteen (18) in total, that have been installed within the harbour basin (Map Item 31). This was to greatly reduce the basin area, the eastern extent of the outfall works still defining the present-day extent of the harbour (Survey Area 3).

A small structure is indicated, just below the Low Water Mark, adjacent to the location of an outfall culvert for the sewage works (Map Item 32). This feature corresponds to STR-01, a timber feature that is discussed in Section 5.3 (Survey Area 2) of the report.

The harbour entrance is depicted in greater detail than the earlier OS map edition. It shows a 44m-long section of quay-wall that extends from the recently reclaimed basin area. The quay retains two (2) opposing sets of access steps, located towards the quay's terminus. These steps have been catalogued as RAS-02 and RAS-03. On the inner (south) side of this structure, adjacent to the quay-wall, a boat-launch is indicated (Map Item 33). This structure comprises an angled masonry wall, upon which a superstructure (likely comprising timber rails) has been built. The superstructure measures c. 30m in length by c. 3m in width, and was presumably installed to allow for the quick launching a life-boat from an adjacent '*Lifeboat House*'; a small rectangular building (measuring c.12m length by c. 5m width) that is directly aligned with the boat launch. While the launching superstructure no longer exists, the underlying masonry substructure remains largely intact. This feature has been catalogued as STR-02 in the report.

Another feature of interest is depicted on the east side of the harbour entrance (Map Item 34). It comprises a circular structure, with access steps to the south, which measures c. 5.6m in diameter. It occupies a vantage point, where the harbour projects from the GSW at a similar location to the seaward terminus of a rampart structure, as depicted on the earlier map edition. The structure dates to the formal establishment of a military fort at Pigeon House, in the early part of the nineteenth century, and was most likely used as a viewing platform and/or gun emplacement. This feature has been catalogued as STR-03.

Moving southeast of the above map item, where the GSW abuts the east side of the Pigeon House precinct, further noteworthy structures are depicted. The first comprises two (2) opposing rectangular structures that form an entrance-way, presumably corresponding to the draw-bridge structure that is annotated on the earlier map edition (Map Item 35). The other depicts a substantial boat-slip (Map Item 36), annotated '*Slip*', that is also included on the first edition map; this feature remains intact and is catalogued as STR-04.

The second, large-scale, development within the precinct comprised the construction of the Pigeon House Generating Station in 1902, annotated '*Electricity Works (Dublin Corporation)*', which occupies a large plot on the east side of the harbour (Map Item 37).

Preceding the establishment of an electricity works, and the aforementioned sewage processing facility, a sewage pipeline was constructed by the corporation between 1878 and 1881. The pipeline ran through the precinct, then alongside the sea-wall to its terminus at White Bank; discharging via a sluice house located upon the south side of GSW (Map Item 38). A boat-slip (annotated '*Slip*') is located on the north side of the GSW at this location; a feature included on the previous map edition as '*White Bank Wharf*'. Both the sluice house and boat-slip are retained.

A cluster of buildings are located on the White Bank, a short distance to the west-southwest (Map Items 40). The easternmost structure comprised a lifeboat house, from which the north wall remains partially upstanding today.

3.3 Dublin Port Archives

The Dublin Port Archive (DPA) provides a wealth of information relating to maritime development within the River Liffey Estuary, since the early eighteenth-century. The collections are currently being catalogued and a number of records are available online, including a series engineering drawings that relate to the North Wall Quay. Several of these are for the downstream section of that structure, as discussed below; the terminus of the North Wall Quay falling within Survey Area 1.

DPA Drawing No. 7199 provides detailed records of Custom House Quay and North Wall Quay in the form of nineteenth-century cross-sectional drawings, a selection of which have been included in Figure 15; section A-D (dated 1866-1867), section B-C (dated 1867-1869), and section D-E (dated 1869). These sectional drawings are taken from points along the downstream extent of North Wall Quay, final c. 20m leading onto the structure's interface with NWQE.

Section D-E depicts the composition of the existing quay structure, as built in the late eighteenth-century. The quay wall comprises thirty-two (32) courses of masonry, including: two (2) foundation blocks, thirty-four (34) facing-stones, and one (1) capstone. The overall height shown is 39.3ft (11.97m), with a water column depth of 31.52ft (9.61m) at High Water and 18.37ft (5.6m) at Low Water. The facing stones are shown to alternate in length, being keyed into the main body of the quay wall behind. The capstone measures 4.6ft (1.4m) in length by 2ft (600mm) in depth. The facing stones measure between 1.64ft (500mm) and 3.28ft (1m) in length and have a uniform depth of 98-inches (300mm). Section D-E also indicates a batter of

1” in 12ft for the upper part of the structure (first 29 no. courses) and a batter of 1” in 6ft for the lower part (8 no. bottom courses). Inspection of the visible extents of the present-day quayside confirms that the quay structure remains, in the most part, unchanged to that shown within these drawings.²¹

DPA Drawing No. 5F.BBS (Figure 16A), entitled ‘*North Quay Deeping Steam Berths* shows’ was produced by Bindon Blood Stoney, Chief Engineer to Dublin Port and Bocks Board, and is dated 28th February, 1870. The drawing shows a series of quay wall cross-sections, including supplementary details (quay fixtures/fittings, etc.), for the North Wall Quay, at a location downstream to the entrance to the Royal Canal. Included in the drawing is a scaled representation of a set of river access steps, annotated ‘*Ferry Steps*’; the design of which was replicated for all access steps located along the North Wall Quay, including the location of two opposing river access steps (as previously discussed) shown on the OS 25-inch mapping. One of these access steps (RAS-01) is located at the western limit of ADCO Survey Area 1 (see Figure 21).

DPA Drawing No. 5074 (Figure 16B), is entitled ‘*North Wall Goods Terminal, Arrangement of rail in Connexion with Travelling Cranes*’ (by Chris Mulrany) and is dated 24th February, 1881. It details the track arrangement at the terminus of the North Wall Quay and also shows a cross section of the quay/ *champsire* with track positions indicated; highlighted Items 1-4. This track arrangement would have lead onto the NWQE, as depicted on the OS 25inch map. On the North Wall Quay, the outer crane-track (Item 1) remains *in situ*, while the inner crane-track has been subject to twentieth-century removal (Item 2). The associated carriage tracks (Items 3-4) also remain, as do those extending along the NWQE; where they are set-back c. 7m from the edge of the quay wall.

3.4 Dublin Port Heritage Conservation Strategy²²

The Dublin Port Heritage Conservation Strategy (DPHCS) has recently been completed by a multi-disciplinary Heritage Team to which ADCO provided the lead.²³ This document recognises the significance of the cultural heritage assets associated with Dublin Port and acknowledges Dublin Port Company’s commitment to preserving, interpreting, and making accessible its heritage assets in the context of its responsibilities for sustainable development as part of the *Dublin Port Masterplan 2040*.

²¹ ADCO has carried out numerous underwater surveys within the River Liffey, including along the base of the North Wall Quay, for various development-led projects, most recently in December 2022 for the Point Bridge Project.

²² Dublin Port Heritage Conservation Strategy, Dublin Port Company, April 2024.

²³ Dublin Port Heritage Team comprising ADCO, RPS, MOLA Architecture, Southgate and Associates, and Shaffrey Architects.

The heritage conservation strategy has its own specific set of reference numbers for all known cultural heritage assets located with the port estate, encompassing the RMP, NIAH, and DCIHR. As such, a corresponding HCS reference number and significance rating has been included (where relevant) for those sites listed in sub-sections 3.5-3.7 below.

3.5 Known Sites and Monuments

The Record of Monuments and Places (RMP) is a list of archaeological sites, based on the Sites and Monuments Record (SMR) files, maintained by the National Monuments Section at the DHLGH. SMR entries include detailed descriptions of archaeological sites based on site visits and historic studies and associated mapping where available. The SMR focuses on sites that are pre-1700AD in date. While later buildings are not well represented in the archive, all structures that are more than 100 years old are considered as archaeological sites today.

Eight (8) sites, listed in the Record of Monuments and Places (RMP), are located within a 500m radius of the river areas under assessment; Survey Areas 1-4 (Table 1, Figure 17, and Figures 21-26). Survey Area 1 is located within the zone of archaeological potential defined for the historic city of Dublin, RMP DU018-020, with Survey Areas 2-4 being located some 2km to the east. Three (3) historically significant structures/sites, listed in the RMP, are located within the immediate area of the current assessment, these comprise: North Wall Quay (DU018-020564), the GSW (DU18-066----/DU19-029002), and Pigeon House Fort (DU19-027---- and DU19-038001).

| RMP Number [RPS Number] | Classification | HCS Number [Rating] | ITM | Status |
|---|-------------------------------------|------------------------|-----|-------------------------|
| DU018-020201- [7543] | Quay; Sir John Rogerson's Quay | ---- | | Standing |
| DU018-020564- [RPS 5834] | Quay; North Wall | N1 [National] | | Standing |
| DU018-053---- [----] | Settlement cluster | N45 [National] | | Not precisely located |
| DU018-066---- [RPS 6797] | Sea Wall / Ballast Office Wall | N56 [International] | | Under Pigeon House Road |
| DU019-027---- [RPS 6795] | Blockhouse; Pigeon House Fort | N76 [National] | | Remnants survive |
| DU019-038001- [RPS 6794] | Signal Tower; Pigeon House Fort | N71 [National] | | Location approximate |
| DU019-029002- [RPS 6797] [RPS 6798] | Sea wall; GSW to Poolbeg Lighthouse | N79 [International] | | Standing |
| DU019-028--- [----] | Battery; Half Moon | N85 [Regional] | | Standing, Swimming Area |

Table 1: Known sites and monuments listed in the RMP within a 500m radius of the areas under assessment.

3.6 National Inventory of Architectural Heritage

The National Inventory of Architectural Heritage (NIAH) is a county-by-county database that identifies, records, and evaluates the post-1700 architectural heritage of Ireland as an aid to the protection and conservation of the nations' built heritage. The NIAH surveys provide the basis for the recommendations of the Minister for the DHLGH to the planning authorities for the inclusion of particular structures in their Record of Protected Structures (RPS).

However, the southern port estate (Poolbeg Peninsula) is not well represented in the NIAH; see Figure 17. As a result, a number of architecturally significant sites are not listed for the survey areas under assessment, the DCIHR designating those sites instead (see section 3.6 below).

Three (3) NIAH entries are located within a 200m radius of Survey Area 1 (Table 2, Figure 21). These entries relate to maritime/ industrial developments along the River Liffey, to the west of Tom Clarke Bridge, and include: North Wall Quay (NIAH 500606556), a quayside building (NIAH 5011168), and a former train depot (NIAH 5001169).

| Registration No. | HCS Number [Rating] | ITM | Description |
|--|---------------------|---------------------|--|
| 500606556 [North Wall Quay] 1780-1820 | N1 [National] | 717746E, 73419N | Stone quay, built c.1800, in two sections, located between Sean O'Casey Bridge and East Link Bridge. Mixed cobbled, granite, sandstone and resin-bonded gravel marking modern landscaped paving scheme. Remains of old railway tracks remain embedded within paving scheme to eastern section. Steps and ramps with granite nosed boundary stones to road side. Bounded by modern steel railings. North Wall Quay retains remnants of nineteenth-century railway infrastructure. |
| 5011168 [Industrial Building] 1860-19000 | ---- | 717898E, 734436N | Detached three-bay two-storey industrial building, built c.1880. Now derelict. Pitched corrugated-asbestos roof behind parapet wall with central gable. The building is a utilitarian structure with a decorative neo-Classical front. It is one of the few remaining dock buildings that evoke the nineteenth-century industrial heritage of North Wall Quay. |
| 5001169 [Train Shed] 1875-1880 | ---- | 717961E, 734487N | Detached sixteen-bay two-storey former train depot, dated 1878, with sixteen-bay east side elevation and triple-gabled rear elevation. Guttered and extended above roof and to west c.2008, with front block retained and east and north elevations to triple-gabled shed retained. The front block remains largely as built and presents a very handsome elevation onto North Wall Quay and announces the end of the north quays as well as the end of nineteenth-century developments along the River Liffey. Fine stone masonry is evident throughout with decorative |

| Registration No. | HCS Number [Rating] | ITM | Description |
|------------------|---------------------|-----|---|
| | | | arcades and door-cases to the front block, constituting an attractive, if altered, remnant from the heyday of Dublin's freight industries on the quays. |

Table 2: NIAH entries, located within the 200m radius of the areas under assessment.

3.7 Dublin City Industrial Heritage Records

The Dublin City Industrial Heritage Record (DCIHR) was developed between 2016 and 2021. This record provides a catalogue of entries that refer to industrial activities of the past and associated infrastructure that includes a range of buildings, artefacts, features and ancillary features. The DCIHR survey makes recommendations for sites to be added to the list of Protected Structures.²⁴ Entries located within the vicinity of the assessment areas are tabulated below (Table 3) and are also included in Figure 17 and Figures 21-26.

| Registration No. | HCS Number [Rating] | ITM | Site Type/Location |
|------------------|---------------------|------------------|---|
| DCHIR 18-12-082 | N20 | 718056E, 734449N | Harbour Master's Office (site of, North Wall) |
| DCHIR 18-12-083 | N33 | 718181E, 734404N | Goods Shed (site of) |
| DCHIR 18-12-084 | N32 [National] | 718305E, 734366 | Quay; NWQE |
| DCHIR 18-12-085 | N23 | 718434E, 734396N | Goods Shed (site of, NWQE) |
| DCHIR 18-12-086 | N30 | 718416E 734362N | Goods Shed (site of, NWQE) |
| DCHIR 18-12-087 | N29 | 718559E, 734350N | Revenue Watch House (site of, NWQE) |
| DCHIR 18-12-088 | N28 [Regional] | 718752E, 734318N | Lighthouse (NWQE) |
| DCHIR 18-12-091 | N22 [Regional] | 718556E, 734481N | Alexandra Basin |
| DCIHR 18-12-092 | N36 | 718051E, 734414N | Lighthouse (site of, North Wall Quay) |
| DCIHR 18-12-093 | N35 | 718043E, 734392N | Lighthouse (site of, North Wall Quay) |
| DCIHR 18-12-094 | N34 | 718085E, 734396N | Landing Stage (site of) |
| DCIHR 18-12-117 | ---- | 717941E, 733846N | Bridge; Ringsend Bridge |
| DCIHR 18-12-118 | N37 | 717921E, 734201N | Boat Slip (Wooden Pier) |
| DCIHR 18-12-119 | N39 | 717944E, 734154N | Bottle Works (site of) |
| DCIHR 18-12-121 | N38 | 717908E, 734132N | Landing Stage (site of) |
| DCIHR 18-12-122 | N41 | 717953E, 733980N | Saw Pit (site of) |
| DCIHR 18-12-123 | N44 | 718056E, 734042N | Bottle Works (site of) |
| DCIHR 18-12-146 | N40 | 717961E, 734131N | Coal Yard (site of) |
| DCIHR 18-12-148 | N43 | 718036E, 734066N | Timber Yards (site of) |

²⁴ Note, the DCIHR is not a statutory designation, nonetheless Policies BHA16 and BHA17 of the Draft Dublin City Development Plan 2022 does endow some status of protection to those sites included in the record.

| Registration No. | HCS Number [Rating] | ITM | Site Type/Location |
|------------------|---------------------|--------------------------------------|--|
| DCIHR 18-12-149 | N42 | 718041E, 734112N | Rope Walk (site of) |
| DCIHR 18-12-151 | N50 | 718758E, 733991N | Syphon House |
| DCIHR 18-12-152 | N51 | 718868E, 733935N | Main Drainage Pumping Station |
| DCIHR 19-09-004 | N73 | 720108E, 733812N | Outfall Works (Pigeon House) |
| DCIHR 19-09-005 | N74 [Local] | 720270E, 733838N | Lifeboat House (site of, Pigeon House) |
| DCIHR 19-09-006 | N77 [National] | 720393E, 733778N | Electricity Works (Pigeon House) |
| DCIHR 19-09-008 | N82 [Regional] | 721367E, 733816N | Lifeboat House (partial remains, White Bank) |
| DCIHR 19-09-009 | N83 [Regional] | 721424E, 733836N | Sluice House (White Bank, GSW) |
| DCIHR 19-09-011 | N84 [Regional] | 721419E, 733856N | Slip (White Bank Wharf, GSW) |
| DCIHR 19-09-010 | N79 [International] | 720684E, 733814N | Sea-wall (GSW) |
| DCIHR 19-09-012 | N78 [National] | 720448E, 733813N | Landing Slip (Pigeon House, GSW) |
| DCIHR 19-09-015 | ---- | 720537E, 733747N 720617E, 733752N | Twin Chimneys (Poolbeg Power Station) |

Table 3: DCIHR entries located within the vicinity of the River Liffey and areas under assessment.

3.8 Shipwreck Inventory

The Shipwreck Inventory in the DHLGH archive is a list of recorded instances of wrecking since 1750. The details provided describe the type of vessel, the journey it foundered on, and information on the ultimate plight of the vessel and its crew, where possible. In describing the wrecking event, the records will locate the incident in relation to the nearest headland or other topographic marker where known. This is not however a record of where the wreckage lies, since the historic records generally only deal with the vessel before it sunk. Such finer details emerge from other sources, such as fishermen's records of snag points and diver records of sites located underwater. These are included in the Inventory wherever possible but it is true to say that most entries lack this final level of data. Finally, it should be pointed out that while the Inventory provides a record of wrecking incidents since 1750, it does not claim to be a comprehensive record for earlier events, and therefore the medieval and prehistoric periods are not represented in this archive.

A total of four-hundred and sixty-three (463) shipwrecks are listed in the inventory for Dublin Bay. Topographic references from the list include: Dalkey, Behind the piles at Dublin, Bailey Light, Bull Island, Blackrock, Clontarf, 1 mile off Dun Laoghaire east pier, Near Dublin, Dublin Bay, Dublin Bar, Dublin Harbour/Port, Dublin, Howth (off Howth, Howth Head, near Howth and Howth harbour), McCarthy's Wharf, North Wall, North Bull, Old pier at Dublin South Bull,

Pigeon House (Fort), Pigeon Hole, Poolbeg, Poolbeg (Harbour), Poolbeg Lighthouse, Quay Wall/River Liffey South Wall, Ringsend (Point), River Liffey/Dublin River, St John's Quay, Sutton, West side of Dublin Harbour, and the White Bank.

Sixty (60) wreck events are listed for the riverbed/seabed areas that surround the proposed development (Appendix 1-A). This includes: seventeen (17) listed for the River Liffey/Dublin River, twelve (12) for Pigeon House, ten (10) for Poolbeg, six (6) for Ringsend, three (3) for Poolbeg Harbour, three (3) for the White Bank, two (2) for Pigeon House fort, two (2) for Behind the Piles, one (1) for Sir John's Quay, one (1) for the South Wall, one (1) for Pigeon Hole, one (1) for Halpin's Pond, and one (1) for Ringsend Basin. The earliest of these wrecking-events dates to the mid-1500s, with the last dating to c. 1907. The majority of the events date to from the late 1700s onwards. There are no entries listed for the River Liffey at North Wall Quay or the NWQE.

A smaller number of known wreck sites are located within the Dublin Port area, as detailed in Appendix 1-B (Figure 17; shipwreck sites). This includes two (2) wreck sites, one located 589m to the north (W01465) of Survey Area 4, and one located 515m to the southeast (W01734).

W01465 lies partially buried within a large intertidal sandbank, located approximately 450m east of the current reclamation extent of the North Port. The wreck was subject to archaeological investigation and detailed recording by the report author in 2008.²⁵ The vessel, which is of timber construction, is orientated in a northeast to southwest direction with the bow located to the south, and the stern to the north. The wreckage forms three (3) disarticulated sections. Vessel construction and the presence of *furring* suggest that the wreck is of eighteenth to early nineteenth-century in date; the wreckage being from a *hooker*, *cutter*, *lugger*, or *smack* type vessel.

W01734 is located within the intertidal zone of the South Bull. It comprises a wooden wreck that was exposed during dredging operations in 2001, now known as the 'Ringsend wreck'. The vessel is oriented east-west and is a composite construction of timber and metal. A keelson was observed in 2001, and it is of carvel construction. There are two other locations associated with wreckage from the same site; reference numbers W11570 and W11571.

²⁵ Rex Bangerter, 'Detailed Archaeological Investigation, Timber Wreck, Dublin Port', 08E0497, 08D0038, 08R0109, ADCO report issued 20.08.2008.

3.9 NMI Topographic Archive

The National Museum of Ireland Topographical Files is the national archive of all known antiquities recorded by the National Museum. These files relate primarily to artefacts but also include references to monuments and also contain a unique archive of records of previous archaeological excavations. The Museum's files present an accurate catalogue of objects reported to that institution from 1928. There is a computerised database of finds from the 1980s onwards. They are categorised by their location into county and further into townland, town, city, street or river where they come from. There are rarely any grid co-ordinates to precisely locate find-spots. However, where find-spots of artefacts are established they can prove an important indication of the archaeological potential of the related or surrounding area.

A large number of artefacts have been recovered from excavations undertaken close to the River Liffey. Among the earliest artefacts encountered were those recovered from excavations at Fishamble Street, these included: two (2) flint blades of Larnian style (similar pieces dated to about 3350BC at Sutton and on Dalkey Island), a Neolithic polished stone axe-head, and a barbed and tanged flint arrowhead of Early Bronze Age type.²⁶ However, only total of twenty-six (26) artefacts are listed for the River Liffey and its associated quay structures. These artefacts range in date from the early Bronze Age (axe-head, 1922:4) to nineteenth-century material (clay pipe fragments, etc., 1937: 2379-2416). Fourteen (14) artefacts are listed for the areas under assessment, ten (10) of which come from riverbed deposits with the Liffey itself (Appendix 2). Three (3) items are listed as being dredged up from a sunken vessel/boat that was located on the north side of channel, near the NWQE; comprising a clay-pipe bowl (1970:190), pottery fragment (1970:191), and a horseshoe (1970:192).

An iron knife-shaped object (1954:168) was also recovered during the excavation of foundations on East Wall Road by Hugh O'Neill and Company Ltd. in 1954. Mr. O'Neill provides a context for the find in his letter to the Irish Antiquities Division at the National Museum of Ireland which states:

'the object mentioned was found in the foundation excavations at New Church on the East Wall Road. These foundations are approximately six feet deep and are sitting on a gravel bed which was formerly a foreshore of the River Liffey. During the excavation, shells, etc. came to light. The top portion of the excavation was filled-in ground.'²⁷

While there is only limited reference to archaeological material being recovered from the areas under assessment, it should be noted that the systematic recording of maritime/riverine data is a recent phenomenon. Moreover, while there is a long history of maritime activity

²⁶ Mitchell, G.F., *Archaeology and Environment in Early Dublin*, Royal Irish Academy, Dublin, p.7.

²⁷ This letter, dated 23rd June 1954, forms part of the file comprising archive entry 1954:169.

within the Liffey, this is counter-balanced by the fact that both the River Liffey and its approach channel would have undergone successive dredging works, from at least the nineteenth-century onwards. This activity is most evident for the downstream section of North Wall Quay and alongside the NWQE, where quayside berths were deepened in the mid- to late 1800s.

3.10 Licenced Archaeological Work

The *excavations bulletin* provides published and online summary accounts of archaeological excavations undertaken throughout Ireland.²⁸ Summaries may also be submitted for inter-tidal survey, underwater assessments, and the archaeological monitoring of marine dredging works. The majority of the entries relate to development-led archaeological work.

Entries relating to the River Liffey and its surrounding environs (River Liffey, River Liffey Quays, North Wall Quay, Ringsend, Poolbeg, Pigeon House Road, and Pigeon House Harbour) are provided in Appendix 3; including archaeological mitigation relating to Dublin Port Company's ABR and MP2 projects.²⁹

As previously discussed, one entry (2004:565) is of particular interest and refers to the excavations at the site of Building C, Spencer Dock, North Wall Quay. The excavation identified three principle phases of activity. These included a series of Late Mesolithic fish traps located on the old shoreline of the Liffey channel, artefacts from the eighteenth and nineteenth-century reclamation of that area, and structures from the nineteenth and twentieth-century development of that reclamation land.

Additional excavations along the North Quay Wall are also referenced, 2007:491 and 2021:211, both of which exposed buried sections of quay-wall, thought to be from an earlier build phase of the quay structure.

A number of underwater assessments have also been carried out alongside the North Wall Quay, carried out as part of the Dublin Bridges project (2016:499), the Bindon Stoney Bridge project (2019:505), and the Dodder Public Transport Opening Bridge project (2019:508).³⁰ More recently, an underwater archaeological impact assessment was conducted for the Point Bridge project (late 2022); work which included detailed recording of the North Wall Quay, above and below the LWM, on the upstream side of Tom Clarke Bridge.³¹

²⁸ Isabel Bennett (ed.) *Excavations Bulletin: summary accounts of archaeological excavations in Ireland*, Wordwell./ www.excavations.ie

²⁹ ADCO Ltd. was appointed Project Archaeologist for both of these projects.

³⁰ The projects were undertaken by the report author.

³¹ Rex Bangerter, UAIA, 'Proposed Bridge Location, Point Bridge and Tom Clarke Bridge Widening Project, River Liffey, Dublin City', 22D0070, 22R0234, report issued November 2002.

Archaeological monitoring of all ground disturbances within Alexandra Basin (ABR project) has taken place, a programme of archaeological mitigation, implemented by ADCO, which commenced with the monitoring of site investigation (SI) works on the NWQE and Crossberth Quay in 2016 (2016:397). The monitoring of the construction phase works was to follow and included:

- Monitoring of piling works for the new quay and anchor-wall, Berths 26-28.
- Excavation and detailed recording of Patent Slip No. 2.
- Recording and subsequent removal of any quayside fixtures/fittings to secure storage.
- Monitoring of works at Pumphouse No. 1 and heritage assessment/reporting on all structures located within the ABR Heritage Zone.
- Monitoring of service installation and resurfacing of T4, at the location of the former shipyard, including remedial works to the Gate Hut at the entrance to Graving Dock 1.
- Monitoring dredging operations within Alexandra Basin.
- Monitoring of the new quay installation at Ocean Pier, Berths 32-35.
- Built Heritage assessment of North Bull Lighthouse and subsequent monitoring of remedial works to the superstructure.
- Underwater assessment and detailed recording of the sub-surface elements of the North Bull Lighthouse.
- Monitoring of remedial work at Former ESB substation, including archaeological excavation and detailed recording of a section of eighteenth-century sea-wall buried beneath.

Monitoring of SI works along the route of the proposed Liffey Tolka Cycling Route has also been carried out. Most recently, an architectural heritage impact assessment of the R&H Hall building and curtilage was completed, which also included detailed laser-scanning (by ADCO) of the structure, both internally and externally.³²

To the south, archaeological monitoring of SI works along Pigeon House Road encountered twentieth-century material, thought to be associated with the outfall works at Pigeon House Harbour (2009:354). The nearby excavation of site investigation trenches for the Dublin Waste to Energy Project also revealed the upper part (metalled surface) of an intertidal causeway that may have led towards Pigeon House Fort (2013:282).

Pigeon House Fort itself was subject to archaeological and architectural assessment, completed in 2009 (2009:357), as part of the Poolbeg Planning Scheme; a project that assessed Pigeon House Fort with regard to any potential future development within Poolbeg peninsula.

Several interventions to the GSW have also taken place. This includes SI works (boreholes) along the sea-wall, extending between White Bank and Poolbeg Lighthouse (2015:175), and monitoring of groundworks at the drainage tie-in to the Rathmines Sewer, located opposite the NORA site at Poolbeg (2020:614). The latter entry describes the sea-wall as follows:

³² Architectural Heritage Impact Assessment Strategy AQW, Southgate and Associates, ADCO, MOLA Architecture, July 2023.

A single line of granite blocks on the south side of the Rathmines sewer formed the outer wall. It comprised alternating large and small blocks with a stepped layout on the north side. The paving was supported at either end by large granite block walls, 0.65m in width, and by a ballast of hydraulic fill consisting of brown fine to coarse sandy gravel with numerous rounded and slightly angled cobbles of varying size.

The quay wall [upper surface of] comprised long granite blocks. The blocks were up to 2.5m long, were on average 0.3m wide and 0.45m deep. They were laid from north to south. Beneath the surface layer of slabs, the southern side of the wall was constructed of slabs of the same dimensions and laid from east to west. The core of the wall was filled with sand.

A number of entries relate to ADCO's archeological monitoring of marine dredging operations within the port, principal amongst these being the capital dredging undertaken for the ABR project (Capital Dredge Seasons 1-4); entries 2018:765, 2019:504, 2020:504, and 2021:425. The monitoring work recovered over three-hundred (300) ship's timbers (and related artefacts) from the north/south slopes of navigation channel and the outer fairway. This included material from a previously unknown shipwreck, located on the north side of the channel, between Buoy Nos. 5 and 7. Subsequent underwater assessment confirmed the presence of *in situ* wreckage lying towards the top of the channel slope; orientated south-south-west to north-north-east. The wreck, subsequently named the 'Millstone Wreck', was subject to detailed recording and analysis.³³ The size and nature of the wreck indicated that it was a sea-going merchant vessel, rather than that of a coastal trader. The observed build and associated diagnostic finds (*staddle* stone, millstone pieces, etc.) also indicated that the vessel is of probable eighteenth-century date, although an earlier seventeenth-century date is also thought to be feasible. It is probable that the vessel was engaged in the regular shipment of cargo to/from the port of Dublin, most likely at time when the port had recently moved downriver to its current location. The wreck provides a tangible reminder of Dublin Port's past seafaring commerce, one that is particularly relevant in the context of the port's recent development plans.

Monitoring of dredging operations for the MP2 project was recently completed (ADCO 2022), which included channel widening to the northeast of the Nora Oil Jetty (Southern Widening Area). No material, deposits, or features of archaeological/historical significance were recovered from the SWA. Final reporting for this project is currently underway.

The monitoring of localised (backhoe) dredging of the riverbed for a new marina development at Poolbeg Yacht and Boat Club was carried in 2004 (2004:579). This work is likely to have impacted c. 3m of riverbed across the marina area. The resulting dredge-spoil consisted of two layers: an upper layer of soft brown silt with frequent modern debris and an underlying

³³ as detailed in Rex Bangerter, 'Alexandra Basin Redevelopment Project, Capital Dredge Season 1, Archaeological Investigation and Monitoring Report', 17E0153, 17D0026, 17R0045, 17E0506, 17D0077, 17R0196, ADCO Report, issued September 2018.

stratum comprising sterile grey silt. No archaeological material was encountered as part of this work.

3.11 Conclusion

The River Liffey provided an essential artery for trade imports and exports to and from the city, this maritime mercantile activity stimulating the continued seaward development of the wider river estuary. The degree of maritime activity is reflected in the number of shipwreck events listed in shipwreck inventory, which records four-hundred and sixty four (464 wrecks) around Dublin and includes sixty (60) wrecking events for the riverbed/seabed areas under assessment; the majority dating from the eighteenth and nineteenth century, when use of the river by shipping was at its peak.

A number of nationally and internationally significant structures that relate to the port's development, from the mid- seventeenth century onwards, are located within the project area, namely: the North Wall Quay (DU018-020564-), the North Wall Quay Extension, the Great South Wall (DU018-066----, DU019-029002), and Pigeon House Fort (DU019-027----) and its attendant harbour area. These structures, which are under statutory protection, are further recognised within the recently completed Heritage Conservation Strategy for Dublin Port.³⁴

4.0 SURVEY METHODOLOGY

The UAIA was undertaken across four (4) underwater/intertidal areas (Survey Areas 1-4; Figures 19-26) and included the following items:

Area 1 (SPAR Bridge/Revetment) - Figure 21

- Underwater assessment of the riverbed across the footprint of the proposed bridge structure.
- Inspection of the quay-wall, *campshire*, and any associated features present, extending across a 80m section of the North Wall Quay Extension (NWQE).
- Detailed recording (laser-scan elevation) of the quay wall, extending beyond the proposed impact area associated with the bridge tie-in location.
- Intertidal survey, south side of the river, along the route of the proposed access road.

Area 2 (Turning Circle) - Figure 22

- Underwater assessment of riverbed adjacent to Pigeon House Harbour and nearby Sludge Jetty.
- Inspection the two (2) sections of quay-wall, forming entrance to Pigeon House Harbour, and any associated features present.
- Detailed recording (laser-scan elevation) of the harbour entrance quays and associated features.

Area 3 (Pigeon House Harbour) - Figure 23

³⁴ Dublin Port Heritage Conservation Strategy, Dublin Port Company, April 2024.

- Underwater/ intertidal assessment of the tidal and sub-tidal areas comprising the bed-level of the harbour.
- Walkover inspection of the upper surface of the adjoining quaysides.
- Recording and isometric laser-scanning of the harbour area.

Area 4 (Plot N, Poolbeg) - Figures 24-26

- Underwater/intertidal assessment of the footprint of the proposed container terminal (Plot N) located adjacent to the ESB power generation station at Poolbeg.
- Inspection of the Great South Wall (GSW) and any associated features present.
- Detailed recording (laser-scan elevation) of the GSW and any associated features.

The above survey work was position-fixed using Total Station and GNSS (RTK) recording, with the resulting data referenced to Irish Transverse Mercator and to Malin Head Ordnance Datum.

Dive operations were carried out to HSA/HSE standards, using surface supplied equipment, from a licensed Dive Support Vessel (Plate 10). All work was carried out in accordance with Safety in Industry (Diving Operations) Regulations 1981, SI 422, the recently updated HSA diving regulations (2019), and DPC's port diving protocols. Mobile/ VHF communications to the Port Operations Centre were also maintained throughout. The on-site work was carried out between 3rd-8th April and 16th-17th May, under licence from the DHLGH; licence numbers 23D0037 (dive survey) and 23R01484 (detection device).

The in-water work was completed by a six (6) man dive-team comprising, maritime archaeologists, a diving engineer, and dive supervisor. Underwater visibility ranged between 300mm and 3m, depending on location/tide state. A maximum depth of 12m was recorded. No limitations to the completion of the UAIA were experienced, although the low visibility and degree of sediment backscatter present did not allow for suitable underwater photography and/or video capture.

An inspection of the above water elements of North Wall Quay/NWQE, Pigeon House Harbour, and GSW was also carried out. This included the quay façades, cap-stones, and associated fixtures and fittings. A walkover survey of the *campshire/* shoreside areas was also undertaken. Any features encountered were subject to written and photographic record and positioned according to ITM.

The laser-scan surveys were carried out at Low Water, scanning those sections of the NWQE, Pigeon House Harbour, and the Great South Wall that fall within or close to the proposed development footprint (Plate 11, Figure 27). As a result, a series of scaled point-cloud plans and elevations were produced, these are included as Figures 28-43.

4.1 Terminology

When referring to the degree of compaction observed for the riverbed deposits under inspection, the terms loose, medium, and hard are relative and do not relate to the measured properties of these deposits. All dimensions in this report are provided in either millimetres or meters according to scale. When referring to sediment grain size, the Wentworth scale has been adopted, as detailed in Table 4.

| Size (mm) | Grade |
|-----------|------------------|
| >256 | Boulder |
| >64 | Cobble |
| >4 | Pebble |
| >2 | Granule (gravel) |
| >1 | Very coarse sand |
| >1/2 | Coarse sand |
| >1/4 | Medium sand |
| >1/8 | Fine sand |
| >1/16 | Very fine sand |
| >1/32 | Coarse silt |
| >1/64 | Medium silt |
| >1/128 | Fine silt |
| >1/256 | Very fine silt |
| <1/256 | Clay |

Table 4: Sediment grain size categories as applied to the riverbed deposits discussed in this report.

5.0 ARCHAEOLOGICAL ASSESSMENT

5.1 Marine Geophysical Survey

A marine geophysical survey was conducted by Hydromaster Ltd. for DPC, under consent granted by the DHLGH, licence number 22R0287, to inform the 3FM project. The survey covered four (4) locations, as indicated in Figure 18. The survey was undertaken in order to identify and map any potential geo-hazards present, identify and map any potential archaeological sites/features present, and provide data/information in support of the Environmental Impact Assessment.

The following instrumentation was employed:

- Multibeam echo-sounder, to acquire bathymetric data.
- Side-scan sonar, to acquire seabed surface data.
- Magnetometer, to acquire data focused on *ferrous* metal identification.
- Sub-bottom profiler, to acquire seismic data that would inform the nature of the buried strata of the seabed.

Both primary data files, along with marine geophysical survey report, were reviewed by ADCO, in accordance with the requirements of the Department, to facilitate independent archaeological interpretation.

Multibeam bathymetry achieved 100% coverage of the survey area. As did the side-scan sonar, magnetometer, and a sub-bottom profile surveys, which were conducted along narrow survey (10m spacing) to provide comprehensive/overlapping coverage.

The data showed a predominately sand/silt seabed surface with coarser material located downstream of Pigeon House Harbour. The sub-bottom profile data did not record any obvious features indicative of palaeo coastlines that are considered to have existed offshore. A large number of contacts were recorded by the side-scan sonar and magnetometer, but the majority of these targets are associated with the moorings at Poolbeg Marina. Moreover, archaeological review of the survey data did not identify any locations within the data sets that indicated high archaeological risk.

Seventeenth (17) side-scan sonar targets were selected for underwater inspection, Targets SS_01 to SS_17 (Figures 19-20); nine (9) targets located within Survey Area 1, three (3) within Survey Area 2, one (1) within Survey Area 3, and four (4) within/close to Survey Area 4.

Diver-truthing of these targets is detailed below in Table 5, with corresponding images provided in Appendix 4. No targets of archaeological or historical interest were encountered as part of this endeavour.

| Target No. | ITM | Underwater Inspection |
|------------|------------------|---|
| SS_01 | 718071E, 734268N | Large, rectangular, window frame (aluminium fabric); pane covered by silt, frame edges upstanding 20mm from riverbed. |
| SS_02 | 718093E, 734276N | Circular depression (700mmØ) in riverbed present; likely from spud-leg of jack-up barge that was carrying out SI work in the area. |
| SS_03 | 718077E, 734296N | Timber framework, southwest corner of Dolphin structure on downstream side of Tom Clarke (East-link) Bridge; prominent scour on west side of pile, measuring 1.54m depth and 1.5m in diameter, with 45° angle of slope. |
| SS_04 | 720486E, 733997N | Target located close to mooring for Buoy No. 16 (mooring buried, but large steel ring and mooring bridle visible). Image shows probable tractor tyre, re-used as a mooring. Feature likely buried in the deep deposit (c. 600mm) of silt that comprises the upper stratum of riverbed within this area. Probing carried out across this area, but object not encountered. |
| SS_05 | 720835E, 733928N | Target relates to modern construction debris associated with the Oil Jetty. Five (5) wide-flange steel beams (H-beams), measuring 300m length and 20mm in thickness are located on the south side of the dolphin structure. These protrude 200mm from the riverbed, rising at a c. 50° angle. A short distance (4-5m) upstream (west) an entrapment areas is formed by a partially buried tree-branch (upstanding between 400mm and 500mm) into which lengths of steel-cable and polypropylene rope is entangled. An area of compact silty-sand (200mm penetration) is located on upstream side of the dolphin. |
| SS_06 | 720169E, 733955N | No object or debris encountered for this target location. Seabed composed of silty-sand with a penetration depth of 200mm. Target represents either a natural features of mobile item/s. |
| SS_07 | 720184E, 733955N | Large, circular, depression in seabed measuring 120mØ and 1m in |

| Target No. | ITM | Underwater Inspection |
|------------|------------------|--|
| | | depth; likely from spud-leg of jack-up barge that was carrying out SI work in the area. A large mooring-ring protrudes 100mm from the seabed at a location 3m to the southwest of the target. Ring measures 300mm in visible length and is likely to have a diameter of 450mm-500mm. |
| SS_08 | 720243E, 733867N | Length of greenheart timber, square in profile (300mm x 300mm) that protrudes at a 45° angle from the seabed. Exposed length measures 900mm in length. Timber has a machine-cut scarf joint at its terminus. A hexagonal-bolt fastening is located half-way along its exposed upper face. Timber is either from a jetty/wharf structure (vertical pile or cross-member) or is part of a fender from a quay-wall façade. Item is of twentieth century date. |
| SS_09 | 720306E, 733833N | Large tree-trunk (flotsam) removed from navigation channel, now moored alongside quay (at pier head) within Pigeon House Harbour. |
| SS_10 | 718635E, 734175N | No object encountered at target location, likely to be mobile item (tree-debris) that is no longer present. |
| SS_11 | 718629E, 734153N | Boat mooring. Weight remains buried with two (2) lengths of anchor-chain running along riverbed. The chains are fastened to corresponding mooring ropes that lead to surface. Seabed composed of a silty-sand with a penetration depth of 400mm. |
| SS_12 | 718366E, 734150N | No object encountered at target location, indicating image is of portable object (large tree-branch similar). Two (2), partially buried, iron wagon-wheels (700mmØ) from a train carriage, reused as mooring weights, are located 8.2m from the target location. Riser-chain is attached to middle part of each mooring, using 18mmØ chain. Seabed composed of a silty-sand with a penetration depth of 300mm. |
| SS_13 | 718387E, 734204N | Tree debris, measuring c. 3.9m in length, with four (4) arms extending from the main branch. Seabed composed of a silty-sand with a penetration depth of 250mm. |
| SS_14 | 718601E, 734129N | Small boat (fiberglass) lying on riverbed, orientated southwest (bow) to northeast (stern); measuring 5m length by 2m width. |
| SS_15 | 718416E, 734145N | Boat (Shetland Motorboat), upstanding from riverbed; vessel measures 6m length by 2m width. Boat is lying on its keel, listing to starboard (c. 20° angle). Outboard engine still attached to stern-board. Two (2) car-tyres (boat fenders) located a short distance from the bow section, to the west and south. Vessel partially visible protruding from water at Low Water [see Plate 12]. |
| SS_16 | 721226E, 734058N | No object encountered at this location. However, riverbed is disturbed; irregular formation (clumps and ridges) present. Seabed is composed of deep deposit of silty-clay (>500mm penetration). |
| SS_17 | 721406E, 734056N | Mooring line and steel-ring (attached to buried mooring block) rising to Buoy No. 14. Seabed is composed of deep deposit of silty-clay (>500mm penetration). |

Table 5: Side-scan sonar targets subject to underwater inspection as part of the assessment.

5.2 Riverbed Topography

Survey Area 1: the riverbed on the downstream side of Tom Clarke Bridge is composed of a light-grey to white silt (100mm sediment depth), overlaying a more compact dark-grey sandy-silt (c. 30%/60% mix) that measures 2m+ in depth. An average water-column depth of 6.6m was recorded, with deeper channels measuring 9-10m in depth also present; these channels corresponding to the openings between the bridge piers/abutments of the upstream bridge.

The riverbed, extending from the NWQE, has a stepped profile before sloping at a c. 35° angle towards the channel centre. The quay's footings are visible in a number of places, where riverbed overburden has been removed by prop-wash; a compact sub-stratum of gravelly-clay also being present across these areas. The surface of the riverbed was observed to be relatively sterile in nature. However, frequent modern debris was encountered deeper within the deposit, predominantly lying at depths of between 300mm and 450mm below the existing bed-level. The presence of modern material, located at depth within the riverbed, attests to the good-holding content present. As such, it is likely that any archaeological/historic layers and/or material would likely remain buried at considerable depth with riverbed sub-stratum.

The riverbed on the southern side of the channel is intertidal in character, exposing c. 15m-section of riverbed at Low Water. This area is delineated by extensive rock-armour protection, placed as part of the construction of the East-link Toll Road (Plate 13). A compact deposit of silty-sand with frequent overlying patches of gravel, pebbles, and small cobbles extends (to the north) for a distance of c. 20m from the base of the rock-armour (Plates 14-15). Frequent nineteenth- and twentieth-century material was observed within the inertial area, comprising frequent pottery fragments and glassware (Plates 16-17).

Survey Areas 2-4: the seabed across these areas comprises a compact deposit of flat/featureless silty-sand (c. 60%/40% mix) with a penetration depth of 100mm. The seabed was subject to intertidal field-walking and, where water-depth exceeded 500mm, dive survey was also carried out. A maximum depth of 15m was recorded for the seabed along the northeast extent of Survey Area 4.

Occasional boulders (displaced rock-armour elements) are located at distance of up to 8m from the sea-wall. Scouring is evident on the channel side of these boulders, measuring 400mm-500mm in depth. No archaeologically significant features were observed protruding from the surface of the seabed, although a number of modern items were encountered (Plate 18).

A good holding-content can be expected for the areas under assessment and the likelihood of buried, *in situ*, material of archaeological or historic interest can be considered high.

5.3 Visual Survey and Assessment

A systematic visual survey was conducted along the in-water/ intertidal extent of the proposed development. A detailed description of archaeological features located within the four (4) assessment areas (Survey Areas 1-4) is provided below; see Figures 21-26 (survey observations) and Figures 27-46 (laser-scan and other recording).

North Wall Quay (DU018-020564-, RPS 5834), extends east from Custom House Quay to a point c. 10m downstream of Tom Clarke (East-link) Bridge, where a set of river-access steps are located (Figure 21; RAS-01). The NWQE, largely completed by 1885, conjoins and extends the quayside on its downstream side. The terminus of the North Wall Quay falls within the upstream extent of Survey Area 1.

The North Wall Quay was subject to successive development, from the eighteenth century onward, seeking to improve access to the quay area at a time when vessels were rapidly growing in size and draft. The original North Wall Quay was built between 1718 and 1726. It comprised a quay structure that measured 18.28ft (60m) in overall width, delineated by opposing quay-walls that rose to a minimum height of 15.2ft/4.64m.³⁵ In the early 1800s, a more substantial quay wall was constructed on its channel side, at a point 19ft (5.84m) to the south, permanently shifting the quay's alignment further into the river channel.

The upstream part of the quay was subject to an additional build-phase, in the mid- to late nineteenth century, with the construction of a significantly larger quay-wall, measuring 35.4ft (10.80m) in height by 15.2ft (4.64m) in maximum width; the intermediate quay-wall being removed as part of this endeavour. In addition, the adjacent bed-level was deepened to a depth of 30.7ft (9.3m) at High Water and 17.7ft (5.39) at Low Water, with a tidal difference of 13ft (3.96m); the quay wall now extending 5ft (1.52m) above the high water mark. The overall width of the quay structure was also increased to 105ft (32m).³⁶ This widening and deepening of the North Wall Quay continued downstream, as depicted in a set of detailed nineteenth-century cross-sectional drawings from that time (see Section 3.3, Figure 15).³⁷

By the late nineteenth century, the need for additional deepening of berths alongside the downstream part of the North Wall (extending between the entrance to the Royal Canal to the downstream terminus of the quay) had once again been identified by the Port's Chief Engineer, Bindon Blood Stoney; as detailed in a set of engineering drawings entitled '*North Quay Deeping Steam Berths*' produced by Stoney in 1870.³⁸ The quay development detailed in these project drawings, while initiated by Stoney, was fully realised by his former assistant and successor, John P. Griffith, in the early 1900s. Griffith also oversaw the straightening /widening and deepening of the navigation channel, using the Port's first suction dredger, in operation from 1895. This, coupled with the NWQE and adjacent Alexandra Basin, meant that Dublin Port could now comfortably accommodate the largest of vessels wishing to dock within the port estate.

³⁵ As detailed in Engineering Drawing No. 8277, Dublin Port Archive.

³⁶ As detailed in Engineering Drawing No. 8853, Dublin Port Archive.

³⁷ As detailed in Engineering Drawing No. 7199, Dublin Port Archive.

³⁸ As detailed in Engineering Drawing No. 5F BBS, Dublin Port Archive.

The downstream section of the North Wall Quay dates to the late nineteenth century and, in the most part, appears to correspond to the build-design as depicted in the aforementioned engineer's drawings of the quay-wall (Figure 15; Cross-section D-E, 1869). It also retains the remnants of the track-work for a number of travelling cranes and associated goods carriages that once operated along the downstream part of North Wall Quay, leading onto the NWQE (see Section 3.3, Figure 16-B).³⁹

Neat-cut, granite, capstones adorn the top of the quay-wall and measure between 800mm-1.2m length (max.), 600mm in depth (vertical dimension), and c. 600mm in visible width (horizontal dimension). Thirty-three (33) uniform courses of granite masonry, excluding the capping stones, comprise the quay's façade. The uppermost course of masonry measures between 900mm-1.2m length and has a uniform depth of 420mm. The lower courses comprise masonry that measures between 800mm and 1.5m in length, with a uniform depth of 300mm.

A flight of river access steps (RAS-01) is located immediately downstream of Tom Clarke Bridge (ITM 718035E, 734385N), forming the juncture between the North Wall Quay and its downstream extension (Plate 19, Figure 21). The structure has been truncated on its upstream side by the aforementioned bridge, removing its uppermost part, comprising six (6) masonry steps. Instead, access is now facilitated by a set of concrete steps, aligned at right-angles to the original structure. A total of eighteenth (18) steps remain *in situ*, leading onto a landing area, located at the low-water mark. The structure has also been impacted by the NWQE on its north side; the original quay wall having been replaced and each of the steps cut/shortened by c. 650mm. The remaining steps now measure 1.05m in length, 320mm in depth, and 230mm in height. Boat tie-off points (wrought-iron fabric) are inset into the riverside part of five (5) of the remaining steps (Plate 20). A grid pattern has been incised into the upper surface of each step to provide improved traction under foot. This was presumably carried out at the same time as the reconfiguration of this section of quay-wall in late nineteenth-century. A wrought-iron hand rail is affixed the façade of the adjoining quay-wall.

Another set of access steps is located immediately upstream of Tom Clarke Bridge, ITM 7182021E, 734386N (Plate 21). The upstream and downstream steps originally formed a matching pair, providing access to the river at a point close to the terminus of the North Wall Quay (as shown on the OS 25-inch map). The upstream steps, which remain fully intact, provide a good indication of the original build for the downstream steps (RAS-01) and, as such, are described below.

³⁹ DPC, Dublin Port Archive, Drawing No. 5074, '*North Wall Goods Terminus: Dublin, Arrangement of Rail in Connexion with Traveling Cranes, Chris Mulrany, 1881.*'

The access steps measure c. 7m length by 1.7m in width and are also recessed into the quayside. Twenty-four (24) steps provide access down to the low water mark. A c. 1.7m by 1.7m landing area is located at the base of the stairs. A wrought-iron hand-rail remains *in situ*, but has suffered considerable erosion. A series of boat tie-off points are located on the river-side of every second step. These comprise a wrought-iron ball (c. 100mm Ø) which has been inset into the upper surface of the step (Plate 22). The quayside masonry located on the upstream (west) side of this feature incorporates a bullnose to the downstream face of each (cascading) masonry course (Plate 23).

The river access steps, as described, also conform to a similar design to those present further upstream. These quayside features serviced a series of boat-ferrys that once operated downstream of Butt Bridge. Indeed, part of a nineteenth-century engineer's drawing details the design of these features, referring to them as '*Ferry Steps*' (see Section 3.3, Figure 16A).⁴⁰

NWQE (DCIHR 18-12-084) forms the quay-wall that extends from the downstream side of Tom Clarke Bridge; a 75m section of this structure falling within Survey Area 1 (Figure 21; Feature F01).

The Port's Chief Engineer, Bindon Blood Stoney, was responsible for the development of the adjacent Alexandra Basin, to which the NWQE formed an integral part; the quay, which delineates the south side of the basin area, accommodating the berthing of vessels within Alexandra Basin and along its channel side. Construction of the NWQE commenced in 1871, as a downstream progression of the existing North Wall Quay, also to a new design by Stoney. This design employed a diving bell to prepare the seabed for the placement of a series of pre-cast concrete foundation blocks. Each of these blocks measured 6.52m (21ft 4") in width and had an average weight of 350 tonnes. The blocks varied between 7.92m (26ft) and 8.83m (29ft) in height and retained a stepped profile with a 1.09m (3ft 6") recess on their internal side. The blocks were prepared on the 'block wharf', located at the north side of the basin, before being floated over and lowered into position. Above the Low Water Mark, large (two tonne) granite ashlar blocks were used to face the quay walls and included stone-cut recesses to accommodate a series of wrought-iron mooring rings.

By 1885, c. 580m of the NWQE had been completed, at which point work on the project was to halt until the early part of the twentieth century. Completion of the quay, which replaced the two wing-walls located at the terminus of the earlier structure, fell to the then Port Engineer, Joseph Mallagh. The new terminus, comprising c. 120m of the quay, was constructed using a

⁴⁰ DPC, Dublin Port Archive, Drawing No. 5F.BBS '*North Quay Deepening Steam Berths, B.B. Stoney, 1870.*'

series of pre-cast caissons (weighing 3,000 tons) that formed the foundation and lower courses of the structure. These caissons were fabricated at a location close to the slipway at Graving Dock No. 1, after which they were brought alongside a nearby wharf, floated onto location and filled with dredged spoil, before being sunk into their final position (Plate 24). The lighthouse (North Wall Lighthouse), which originally adorned the terminus of the earlier NWQE construction, was relocated into its current position in 1937.

As previously discussed, the OS 25-inch map suggests the location of associated features, including a series of goods sheds, a revenue watch house, and a crane-pad, that may survive beneath the existing surface of the quay (DCIHR Nos. 18-12-083, 18-12-085 - 18-12-087).

The NWQE extension (Feature F01) forms the quay's façade behind a set of river access steps (RAS-01) which originally formed part of the North Wall Quay (see Plate 19).

Neat-cut, granite, capstones adorn the top of the quay-wall and measure between 800mm-1.2m length (max.), 600mm in depth (vertical dimension), and c. 600m in visible width (horizontal dimension) (Plate 25). The quay-wall is composed of uniform courses of granite ashlar, measuring 300mm in width and between 1.3m and 1.5m in length (Plate 26). Occasional smaller masonry pieces have also been used, measuring 550mm-600mm in length. Fifteen (15) courses of masonry are visible forming the façade at Low Water.

Underwater assessment confirmed that the quay footings are visible in places, extending 800mm from the base of the quay wall and to between 300mm-400mm in depth.

A series of contemporary and later quayside fixtures and fittings are present along the NWQE, a number of which fall within the assessment area (Figure 21). Two (2) sets of iron mooring hoops (MH-01 and MH-02) adorn the top of the quay wall at ITM 718048E, 734384N and ITM 718063E, 734382N (Plate 27). These fittings are formed of robust iron-work that is inset into the upper part of the capstones. Modern mooring hooks have been fastened to these fittings using D-shackles. A cast iron mooring bollard (MB-01) is located between the above mooring hoops at ITM 718034E, 734383N (Plate 28). This feature is retrofitted to the top of the quay using a base plate (500m x 500m) and six (6) hexagonal bolt-fastenings.

River access ladders (AL-01 and AL-02) are located at ITM 718051E, 734383N and 718066E, 734382N (Plates 29-30). The first of these items, positioned 14.8m downstream of Tom Clarke Bridge, has been recessed into the quay wall and is integral to its construction. However, the original wrought-iron ladder does not remain *in situ*, having been replaced by a more recent version. Only the 'grab handle' component of the ladder assemblage retains some age, being an earlier replacement. This handle feature forms a simple wrought-iron

loop, inset into the cap-stone and positioned at a point c. 100mm from the edge of the quay wall. Recessed access ladders are also present at regular intervals upstream (along the North Wall Quay) and remain similar to that described above, none retaining their original ladder-work.

The second access point (AL-02) is located 30m downstream of Tom Clarke Bridge. It comprises a steel ladder that has been retrofitted to the quay-wall, flanked on each side by timber fenders. The timber fenders, measuring 250mm width by 250mm depth, and are secured to the quay by three (3) sets of iron base-plates (500mm x 150mm in size).

A single, recessed, mooring-ring (RMR-01) is located along the quay façade, at a point 33.6m downstream of Tom Clarke Bridge, ITM 718069E, 734381N (Plate 31). The recess measures 250mm in depth, 1.3m in width, and 1.2m (max.) in height. The edges are rounded and the base of the recess forms a gentle curve. The mooring comprises a small forged-iron ring (oval-shaped) measuring c. 600mm in length and c. 80mm in thickness. The mooring-ring is attached to a robust iron-fitting, measuring 570mm length by 150mm in thickness. This mooring is replicated across the extent of the NWQE.

The NWQE and associated features are not presently included in the RMP or the NIAH. It is however, included within the DCIHR and has (most recently) been included as a distinct site in the Heritage Conservation Strategy for Dublin Port, under HCS Number N32.

Pigeon House Fort (DU019-027----, RPS 6794/6795)

A military barracks/fort (DU019-027----) was established at Pigeon House in the early part of the nineteenth-century. The area, first known as 'Greens Patch', comprised a sandbank located close to a sub-tidal pool, called the 'Salmon Pool'. A blockhouse (storehouse), known as The Pigeon House after a John Pidgeon its resident caretaker, is thought to be the first permanent structure to be built at this location. His name would also be given to the aforementioned Salmon Pool, later becoming known as 'Pigeon House Hole'.

Following the establishment of the Ballast Board in 1786, designs for a harbour were progressed and a hotel was also built in c. 1793. The area was commandeered by the military in 1798, remaining under temporary occupation as a military fort until its purchase from the Ballast Board in 1814. The precinct was then formalised into a fortified harbour and associated buildings (Plate 32), comprising: a signal tower (DU19-038001, RPS 6794), barracks, officer's quarters, magazine/armoury, defensive boundary walls/ramparts, gun-emplacements, grain-store, east/west entrance gates, eastern boat slip, and nearby ordnance store.

The precinct functioned as military fort until 1897, at which point it was sold to Dublin Corporation. Work on the Dublin Main Drainage Scheme had begun the previous year, the project reaching completion with the establishment of an outfall works at Pigeon House Harbour in 1906 (DCIHR 19-009-004). The outfall works included the construction of a series of settling-tanks (sludge beds) that were to occupy much of the harbour basin; these being replaced with the present-day structure in the early 2000s. Pigeon House Generating Station was also built on the east side of the precinct, coming into operation in 1903. The power station now forms an imposing red-brick edifice that extends across a c. 150m section of the site, on the east side of the harbour basin.

The GSW conjoins with the fort/harbour area, on its east and west side, with the ballast office wall once defining much of the harbour's southern extent. The channel side of the harbour basin was defined by two sections of quay wall; an east-west section measuring 335m length (Feature F02) and almost right-angled return wall (running north-south) which measures 95.5m in length. The latter structure conjoins with the GSW at the harbour's southwest corner. The aforementioned outfall works, coupled with modern reclamation of the foreshore on the north side of the basin, have obscured much of the harbour-walling. In addition, the GSW, which originally delineated much the harbour basin on its south side, is no longer visible. A short (c. 50m) section of fully exposed (internal) quay-wall is visible along the southeast corner of the harbour area (Feature F03). This structure is thought to conjoin with the buried terminus of the GSW at a point c. 200m to the west. The quay-wall that formed the east side of the historic harbour area is largely obscured by a sheet-pile wall (northernmost part) and a partially collapsed concrete quay. The harbour area aside, Pigeon House Fort retains sections of fortified boundary wall, its former officers' quarters (originally Pigeon House Hotel), a portion of its western gatehouse, and a circular (seaward-facing) viewing platform/gun emplacement.

Feature F02 comprises the visible remains of two (2) sections of historic quayside forming the entrance to Pigeon House Harbour, on its east and west sides (Figures 22-23).

The west side of the harbour is delineated by a 124-long section of quay wall that extends eastward from an area of reclamation (measuring 192m east-west by c. 76m north-south) that obscures much of the structure (Plate 33). A 30m section of the quay is also partially visible on the west side of the reclamation area, where a power-station (cooling-water) outfall is situated. Construction of the sludge jetty has impacted the upper part of the quay wall (along a 15m section) and a culvert for the adjacent outfall works (settling tanks) has removed a 4m by 5m section of the structure's façade (Plate 34). In addition, the quay's upper surface has been buried to the west of the sludge jetty, where it forms an access road to the

aforementioned reclamation area (Plate 35). A cement render covers the capstones along this section of quay wall, which is now topped by a series of concrete barriers.

Only a c. 37m section of this feature remains fully visible/intact, positioned to the east of the sludge jetty where it forms a pier head at the harbour entrance (Plate 36). Neat-cut, granite, capping adorns the top of the quay-wall along this section, laid north-south to form the surface (deck-level) of the quay; ranging in length between 1.1m (min.) and 165m (max.). The vertical-face of the capstones measures 250mm in width (horizontal dimension) and 400mm in depth (vertical dimension). The quay-wall is composed of uniform courses of granite ashlar, measuring 300mm in depth (vertical dimension) and between 550mm (min.) and 1.07m (max.) in length (Plate 37). Fifteen (15) courses of masonry are visible forming the façade at Low Water, upstanding to a maximum height of 4.48m from the foreshore. The masonry courses retain a stepped-profile, similar to that observed for the Great South Wall, with each outward step in the course measuring 30mm, 50mm, or 70mm in width (Plate 38).

The pier-head measures 8.4m in width and is flanked by opposing flights of river access steps, positioned on the north (external) and south (internal) side of the structure; RAS-02 (ITM 720310E, 733848) and RAS-03 (ITM 720310E, 733840) respectively (Plate 39, Figures 22-23). The channel side access steps (RAS-02) are only partially intact, the topmost seven (7) steps remaining *in situ*. These are formed by masonry that has been set into the quay's façade, the steps extending from the quay-wall by 1.24m (Plate 40). The tread depth of each step measures 300mm. Collapsed masonry form RAS-02 is evident at the base of the quay wall (Plate 41).

The internal steps (RAS-03) remain better preserved, extending the full height of the quay wall. As noted for the opposing access steps, these have also been set into the quay-wall and extend to a similar step length (Plate 42). However, the tread depth is not uniform, as observed for RAS-02, ranging between 300mm and 400mm in depth.

Two (2) mooring bollards (MB-02, MB-03) are inset into the upper surface of the quay; one located 18.4m west of the pier-head (ITM 720299E, 733844N), the other 2.94m from the pier-head (ITM 720315E, 733844N) (Plates 43). Both are of an identical (mushroom-cap) design, forming robust cast-iron bollards that upstand 500mm from the quay's deck-level. The caps are oval-shaped, measuring 700mm length by 502mm width. The shaft component measures 400mm in diameter. These moorings, which are also located elsewhere within the existing harbour area, are a later addition to Feature F02; being contemporary with the early-twentieth century development of the outfall works within Pigeon House Harbour.

Two (2) noteworthy structures are located in proximity to Feature F02 (STR-01 and STR-02).

STR-01 comprises a timber structure that is positioned c. 14m north (channel side, ITM 720262E, 733622) of a culvert associated with the Pigeon House outfall works (Plate 44). The structure is formed by two (2) square-shaped timber columns, spaced 5m apart, conjoined by a horizontal timber frame. Each column is composed of four (4) vertically-set timber posts (mearing 300mm x 300mm) with a lattice-work of internal cross-beams forming the sides; each element fastened together using large (recessed) iron-bolt fastenings. Each of the piles is protected by an iron pile-cap. The overall structure measures 8.32m east-west by 1.35m north-south.

The exact nature of STR-01 remains unclear, however, it does appear to retain some age and is also depicted on OS 25-inch Map of the area (see Figure 13; Map Item 32). Moreover, the adjacent culvert, having undergone modern repair as part of the modernisation of the outfall works in c. 2003, most certainly formed part of the earlier works at this location (see Plate 34). As such, it is likely that STR-01 is associated with the original culvert and is of a similar date.

STR-02 comprises a section of angled retaining-wall that is located at the northwest corner of Pigeon House Harbour (modern extent), ITM 720283E, 733836N (centrepoint) (Plate 45). It is composed of rough-cut masonry, laid at a c. 45° angle, to form a training-type wall that measures 11.8m length by 4.9m in width (Plate 46). The masonry measures between 300mm x 500mm (min.) and 500mm x 1.2m (max.) in size. The structure is bounded by Feature F02 to the north, and a twentieth-century concrete quay-wall to the south.

The OS-25 inch map depicts a 'Lifeboat House' (DCIHR 19-09-005) and associated lanching slip at this location (Figure 13; Map Item 33). It is likely that the angled retaining-wall represents the remains of a sub-structure to a timber-framed (or similar) superstructure from which a life-boat was launched/ recovered.

The east side of Pigeon House Harbour has been substantially altered from the original; a c. 50m-long section of quay wall (north-south orientated) having been removed and replaced with a sheet-pile wall, set back up to 15m from the original (orientated north-east to southwest). This sheet-piling extends to encompass a modern pier-head, before turning east to delineate the channel side of the entrance for a distance of c. 19m (Plates 47-48). At this point, part of the masonry quay (Feature F02; east) that originally defined the eastern entrance to Pigeon House Harbour becomes visible, set back from the sheet-pile wall (Plate 49). It comprises a short section of north-facing quay façade, measuring 34m length (ITM 720379E, 738546N to ITM 720414E, 733847N). The quay wall retains a similar build to that of the previously discussed section of Feature F02, located on the west side of the harbour

entrance. Extensive rock-armour protection has been placed along the base of quay wall and is largely exposed on a low tide (Plate 50).

The upstanding remains of a structure from Pigeon House Fort (STR-03) are located immediately above this section of quay wall, at ITM 720406E, 733844N (centre-point). This feature comprises a circular gun-emplacement and/or viewing platform located c. 45m east of the pier-head (Plates 51-52). STR-03 is positioned at the terminus of a 'rampart' feature depicted on the OS First Edition Map (Figure 10; Map Item 13). It is also depicted as a distinct structure on the OS 25-inch edition map (Figure 13; Map Item 34).

The structure measures c. 7m in diameter and is delineated on its seaward circumference by a masonry wall (limestone fabric) comprising six (6) courses of masonry upstanding to a height of 2.9m. The masonry ranges in size from 150mm by 200mm (min.) to 400mm by 700mm (max.). The masonry appears to have undergone repair (historic) in a number of places. Neat-cut, angled, capstones adorn the wall top. Two (2) access steps are visible on its south (landward) side; a third step remaining buried within the modern surface of the quay at this location. A modern, concrete, structure has been built within STR-03 and is thought to be a pillbox (guard-post) of twentieth century date.

Feature F03 comprises the original, masonry, quayside, delineating the southeast and east side of Pigeon House Harbour (Figure 23); the quay's façade being fully visible on the southeast side of the harbour basin (43m section) and only partially visible along its east side (c. 90m section).

To the southeast, the quay-wall is composed of thirteen (13), uniform, courses of granite ashlar, measuring 300mm in depth (vertical dimension) and between 400mm (min.) and 1m (max.) in length (horizontal dimension). The quay wall is upstanding to a height of 3.9m (Plate 53). The quay's façade retains a stepped profile, similar to that observed for Feature F02 and the GSW. A c. 2.2m high defensive parapet-wall has been built upon this section of quayside; a wall feature that includes openings for the use of both musketry and larger field artillery. The parapet wall was built as part of the harbour's fortification in the 1800s. A twentieth-century cast-iron pipe (300mØ) has been retrofitted to the wall. At the eastern terminus of this wall section, the quay has been underpinned using poured mass-concrete and the remains of associated timber shuttering is also visible (Plate 54). In addition, the remains of a short length (10m) of timber wharf (twentieth-century date) are fastened to the quay's façade along this section.

The collapsed remains of a timber and concrete quay, also of twentieth century date, define a c. 90m section of the harbour basin on its east side (Plate 55). Behind this jumble of quayside

debris lie the remains of the original quayside (Plate 56). The structure comprises ten (10) visible courses of flush-set (granite) masonry, measuring 400mm in depth (vertical dimension) and between 450mm (min.) and 1.20m (max.) in length (horizontal dimension). The quay also retains a number of wrought-iron mooring-rings (Plate 57); internal diameter of 390mm.

The Great South Wall (RMP DU018-066---/DU019-029002-, RPS 6928), extends along the south side of Dublin Port in a series of visible and buried sections, running from Ringsend Point (to the west) to Poolbeg Lighthouse (to the east), at the entrance to the navigation channel (Figure 17, Figures 22-46).

The origin of this significant engineering achievement dates to the early part of the eighteenth century, when a timber breakwater (known as 'The Piles') was constructed from Ringsend Point, running eastward past the Green Patch (later Pigeon House Precinct), out towards the channel entrance. Timber piling for this structure was progressed in 1716, with the final breakwater completed in 1731 and measuring some 3,109m (9,904ft) in length.

The Ballast Board was to later construct a more robust, rubble-stone, structure between Ringsend Point and the Pigeon House. The new sea-wall, known as the Ballast Office Wall (DU018-066), was completed in 1759 and comprised a double-wall structure, in-filled with sand, which measured 2,100m (6,889ft) in length and varied between 37ft and 48ft in width. Much of the structure now remains buried, only occasional lengths being visible as low-slung walls. The channel side façade of this structure was visible up until the mid-twentieth century, at which point it was buried behind a new container terminal (built in 1974) and the toll-road for the East-link Bridge (opened in 1984) (see Plates 2-3). A single length of the structures north-facing façade remains visible today, located at the outfall for the ESB Dublin Bay Power Plant.

In addition, the outer length of the timber breakwater, where 'The Piles' extended seaward from Pigeon House to the harbour entrance, was to undergo replacement in the latter part of the eighteenth century (1761-1795). A sea-wall, measuring 2,654m (8,707ft), was constructed (DU19-029002) in its place; located a short distance to the north of the timber breakwater. The new structure was distinct from the Ballast Office Wall in that it comprised a rubble-stone/mortar core, faced by uniform courses of granite ashlar (Figure 28). Masonry also comprised the upper surface to form a deck-level measuring 7.3m (24ft) in width. A series of timber cross-members were also used in its internal construction.

Proposals for the repair and maintenance of the seaward-most section of the GSW, dated 1801, included the raising of the sea-wall to a point 1.3m higher than the Ballast Office Wall and the placement of rock-armour protection along its foundations. These additional works

were subsequently undertaken with a 1,307m (4,288ft) length being completed by 1803, and the remaining 1,347m (4419) completed by 1805.

Today, the sea-wall remains extensively intact, forming a popular walk from the east side of the peninsula to Poolbeg Lighthouse. The upper parts of this c. 2720-long section are fully visible, with the lower parts/foundations being covered by extensive rock-armour protection. Moving west, where the sea-wall traverses the channel side of ESB lands at Poolbeg, the southern side of the structure becomes buried. However, excluding a number of modern innervations, the structure's northern façade and upper surface remain largely unobscured.

The two distinct lengths of sea-wall wall (as discussed above) were to become known collectively as the Great South Wall and are now registered as archaeological monuments and protected structures. However, it is the author's opinion that the sections of quay wall surrounding Pigeon House Precinct (as previously detailed) should also be considered as integral to the overall structure comprising the GSW, and as such afforded the same protection. This assertion is reflected by the inclusion of these quay-wall structures in the overall designation of the GSW in the Heritage Conservation Strategy for Dublin Port.

For ease of discussion, the length of the GSW under inspection (990m section) has been divided in to five (5) sub-sections; GSW-West, West 1, West 2, West 3, and East 1 (as detailed in Figure 27).

GSW-West (Figure 24 and Figures 37-38)

This comprises a 120m section of the GSW, extending between Pigeon House Fort, to the west, and the first of two ESB jetty/in-take structures, to the east (ITM 720446E, 733810N to ITM 720565E, 733814N); the latter structure being cantilevered over the GSW at a height of 500mm.

The surface of the GSW, although overgrown with low-lying vegetation remains largely visible, as does masonry comprising much of its northern (channel-side) façade. Indeed, this section of the sea-wall provides best exposure of the façade, with up to twelve (12) courses being visible at Low Water; the structure upstanding to a maximum height of 3.6m at this location (Plate 58). The southern side of the structure is not visible, being buried behind poured mass-concrete that conjoins the sea-wall with the adjacent ESB site.

Neat-cut, granite, capping adorns the top of the quay-wall along this section, laid north-south to interlock with the masonry that forms the surface (deck-level) of the sea-wall; ranging in length between 1.2m (min.) and 162m (max.) (Plate 59). The vertical-face of the capstones measures 250mm in width (horizontal dimension) and 400mm in depth (vertical dimension). The channel side façade is composed of uniform courses of granite ashlar, measuring

300mm in depth (vertical dimension) and between 520mm (min.) and 1.20m (max.) in length. The masonry courses retain a stepped-profile, similar to that observed for Features F02-F03 (quay walls; Pigeon House Harbour), with each outward step in the course measuring between 20mm-30mm.

A c. 30m section of the structures façade, extending westward from the ESB jetty structure, is obscured by a sheet-pile wall and associated rock-armour protection (Plates 60); representing consolidation works undertaken as part the construction of the aforementioned structure.

The deck slabs, which retrain similar dimensions to the capping stones described above, remain (for most part) in a good state of preservation. Some slumping of the deck was observed toward the eastern extent of this section of the sea-wall at ITM 720550E, 735812N (Plate 61); located c. 10m west of the ESB platform/jetty and presumably an impact related to the construction of this adjacent structure. A minor change in the level (height) of the sea-wall was also observed a short distance to the east of this area (ITM 720522E, 733808N); the deck-level dropping by 110mm at this location (Plate 62).

A substantial, masonry boat-slip (DCIHR 12-09-012) abuts the GSW at its western end, where it conjoins with the Pigeon House Precinct. This feature, which is depicted on both the OS First and OS 25-inch map editions, is contemporary to the construction of the sea-wall and has been catalogued as STR-04 in this report (Plate 63).

STR-04 measures 25m in length and 4.3m in width. The slipway slopes gently from west to east at a c. 10° angle. The slip's surface comprises rectangular granite masonry, retaining similar dimensions to the blocks used to face the surface of the adjacent GSW (Plate 64). The structure is upstanding to a maximum height of 1.6m from the foreshore, where four (4) courses of granite masonry are visible. This masonry, which has similar dimensions to the ashlar used in the GSW, also retains a stepped profile. A series sheet piles protrude, to maximum height of 500mm, from the silty-sand on the channel side of STR-04.

Three (3) concreted, iron, spheres (probable cannon balls) were encountered along the base of the GSW, a short distance to the east of STR-04 at ITM 720480E, 733813N (Find Nos. 23D0037:01-03, Plates 65-67). These finds, coupled with the nearby gun-emplacement (STR-03, provide us with a tangible reminder of the military's development of Pigeon House in the 1800s.

GSW-West 1 (Figure 25 and Figures 39-40)

This comprises a 39.2m section of the GSW, extending between two ESB jetty/in-take structures, ITM 720601E, 733815N to ITM 7200641E, 733816N. Both of these structures are cantilevered over the GSW at a height of 500mm (Plates 68-69), although localised impacts

to the upper courses (channel-side) of the sea-wall can be observed in several places. As per the previous section of sea-wall, the southern side of the structure remains buried. A series of equidistantly spaced metal-bollards have been retrofitted to the sea-wall (close to the edge), between which link-chain is fastened to create a safety barrier.

The surface of sea-wall is uneven, dipping in a number of locations, across the extent of this section of the structure (Plate 70). Repointing (cement) of the deck-level masonry has been carried out in order to consolidate the surface (Plate 71).

Rock-armour protection runs along the base of the sea-wall, limiting observation of the structures façade to its uppermost (four) courses.

GSW-West 2 (Figure 25 and Figures 41-42).

This comprises an 86.28m-section of the GSW, extending between an ESB jetty structure (to the west) and the NORA Oil Jetty (to the east); ITM 720661E, 733017N to ITM 720746E, 733821N.

This section of the GSW remains in a relatively good state of preservation, the deck area remaining level and no evidence of dipping/ slumping cross its surface being present (Plate 72). The Oil Jetty sits upon the GSW, obscuring a c. 14m section of the structure. Concrete ramps provide access to the jetty from the sea-wall on either side of the structure; extending across a c. 13.4m section of the GSW to the west, and a c. 9.8m section to the east. As per the previous section of sea-wall, the following applies:

- The south side of the structure remains buried behind an area of poured mass-concrete that leads onto the ESB site.
- The deck-level has been repointed using cement to consolidate the upper surface of the structure (Plate 73).
- A series of equidistantly spaced metal-bollards, fastened with link-chain, form a safety barrier close to the edge of the GSW.
- Rock-armour has been placed along the base of the sea-wall which obscures the channel-side façade, leaving only the upper most courses of the structure visible.

GSW-West 3 (Figure 25, Figure 28, and Figures 43-44)

This comprises a 108.5m section of the GSW, extending to the west of the NORA Oil Jetty, ITM 720753E, 733821N to ITM 720861E, 733824N (Plate 74-75). The sea-wall is truncated by an outflow channel for the ESB power station, impacting a c. 22m section of the structure between ITM 720820E, 733815N and ITM 720840E, 733518N (Plate 76). A ramped concrete structure, measuring 42m length by 4m in width, forms a bridge over the outflow channel (Plate 77). A sheet-pile wall extends, in a gentle curve, from the west side of the outfall for a distance of c. 36m, before turning due east to run parallel to the sea-wall for a distance of c. 193m.

The surface of the GSW remains in a good state of preservation across this section and has undergone repointing using cement. The general observations listed previously also apply to this section of the GSW.

GSW-East (Figure 26 and Figures 45-46)

This comprises a 556m section of the GSW, extending from the east side of the ESB outflow to a point 272m downstream of the ESB Jetty, ITM 720861E, 733824N to ITM 721430E, 733853N.

A significant portion of the GSW within this area (192m section) lies behind a sheet-pile wall, the channel formed between this and the GSW measuring 22m in width (Plates 78-79). A series of diffusers release treated effluent at a location c. 180m along this channel (Plate 80). An associated outfall pipe truncates the GSW at this location, ITM 721002E, 733830N (Plate 81).

A curved gantry comprises the ESB Jetty, located at the western limit of the development area (Plot N) at ITM 727161E, 735838N.

The sea-wall remains well-protected behind the aforementioned foreshore structures, where a deposit of compact silty-sand has built-up along the foreshore. The sea wall extends to a height of 2.2m at this location, with vertically set capping stones and six (6) courses of ashlar masonry forming the visible façade (Plate 82).

On the west side of the ESB Jetty, a heavily eroded sheet-pile wall extends southward across the intertidal zone to conjoin with the outflow channel (Plate 83).

To the east of ESB power station, the GSW forms a promenade that delineates the southern side of the channel until its terminus at Poolbeg Lighthouse. Much of the structures north/south façades are obscured by the placement of rock-armour protection along its base. This protection extends to a width of up to 6m from the sea wall. The boulders used in the protection works are substantial, with some measuring more than 2m in length (Plates 84). As a result, where rock armour is present, only between four (4) and nine (9) masonry courses are visible below the capping stones (Plate 85). Despite the rock armour protection, slumping/dipping of the wall's masonry is visible in several places along its extent. The structural deterioration is most likely due to the fact the only the largest rock armour components remain present; smaller boulders having been washed away over time. Consequently, sea-wash is able to penetrate the larger gaps that are frequently present across rock-armour (noted to be up to 500mm x 1m in size); undermining the sea wall as a result (Plate 86).

At a point c. 240m east of the ESB Jetty, at the downstream extent of Survey Area 4, a set of masonry access-steps and a nearby boat-slip (DIHR 19-09-011, STR-04) from part of the structure (Plates 87-88). These features are depicted on both the OS First Edition map, where it is annotated '*White Bank Wharf*' (Figure 13; Map Item 19). It is also included on the 25-inch map edition (Figure 14; Map Item 39).

The access steps comprise twelve (12) masonry steps, leading east-west (top-bottom), that provide access to the foreshore at Low Water. These steps mark a change in the construction style of the GSW, the capping stones used changing from vertically-set blocks to larger horizontally laid masonry. No rock-armour is present along this section of the sea wall, allowing the full extent of its façade to be visible. Elven (11) courses of masonry form the outer face of the structure, extending between its capping stones and foundation elements.

The downstream boat-slip (STR-04) comprises rectangular masonry, measuring between 1m-1.30m in length, laid at right angles to the sea-wall. The northwest corner of the slipway has suffered erosion and undergone partial collapse. This damage appears to be a direct result of wash from shipping entering/exiting the port at Low Water.

5.4 Laser-scan Survey

Laser scanning of the NWQE and the GSW sections was completed in two mobilisations, those sections of sea-wall falling within ESB lands being completed during the second mobilisation. Where possible the survey sought to record the features in both elevation and plan, coupled with perceptive views that provide a detailed topographic setting for the features under assessment (Figures 27-45). The resulting point cloud data provides highly accurate mapping of the features under assessment and a detailed baseline from which to add further detail as/when required.

Several limitations to the scanning process were experienced during the survey. Firstly, the gathering of high-resolution images to overlay onto the point-cloud data is best achieved when the overhead light is indirect. However, the presence of direct sunshine during parts of the survey resulted in some colour saturation within the images gathered. Secondly, the presence of the sheet-pile wall for the ESB outflow channel precluded laser scanning of a c. 190m section of the GSW at that location. Lastly, a fixed/stable platform is required when operating the laser-scanner; as such the set-up locations available to scan elevational details were limited in number.

5.5 Metal-detection Survey

Metal-detection survey of the riverbed proved impractical across much of the underwater survey areas, due to the large number of targets encountered. The survey revealed an almost

constant hit ratio and, as such, it was not possible to tune out the background metallic signature generated by the volume of modern metallic debris present. The majority of the metal-detection hits represented sub-surface targets. However, all surface targets were inspected and proved to be of modern origin.

5.6 Conclusion

The archaeological assessment was systematic and comprehensive, extending well beyond the underwater/ intertidal construction footprint associated with the proposed port development (Survey Areas 1-4).

No archaeologically significant material, structures, or deposits were encountered as part of the underwater survey. However, a good-holding content can be ascribed to the riverbed/seabed areas under assessment and the potential for archaeologically significant material to be buried at depth remains. Although this potential is moderated by channel deepening (dredging) works that have taken place along the river channel since the nineteenth century. In addition, construction works for Tom Clarke Bridge are also likely to have reduced the archaeological potential of the riverbed on its downstream side.

The assessment has recorded in detail all archaeologically significant features falling within the identified survey areas (Survey Area 1-4). This includes: the downstream terminus of the North Wall Quay leading onto an 80m section of the NWQE (Feature F01); the various sections of historic quay that form the basin area at Pigeon House Harbour (Features F02-F03); and a 910m section of the GSW (Feature F04) as it extends eastward from Pigeon House Fort.

The following section details potential impacts arising from the proposed 3FM project, with corresponding mitigation measures provided in Section 7.0 of the report.

6.0 POTENTIAL IMPACTS⁴¹

Despite the significant construction footprint associated with the proposed 3FM project, there are only two (2) direct physical impacts to known riverine archaeological features arising from the proposed development; (1) the proposed SPAR bridge tie-in and access road impacting a c. 20m section of the North Wall Quay Extension; and (2) the removal of an early twentieth century timber structure (STR-02) associated with an outfall culvert at Pigeon House Harbour.

⁴¹ This section does not purport to relate to precise engineering details but is rather an attempt to understand the nature of the impact on the potential archaeological environment, based on the supplied data.

No new impacts to the GSW are envisaged as part of the project and an exclusion zone surrounding the sea-wall has been included as part of the construction design. However, multiple impacts to the riverbed/seabed can be expected. Moreover, given the archaeological potential of these deposits to retain archaeologically significant material, items, and/or structures, the riverine areas under assessment should be considered to retain high archaeological potential.

6.1 Impact Categories

Impact/effect categories will typically have regard to those set out in the EPA 'Guidelines for Information to be Contained in EIAR' 2022, 'Guidelines on the information to be contained in Environmental Impact Statements', 2002; 'Advice notes on Current Practice (in preparation of Environmental Impact Statements), 2003 and Revised Draft 2015, EPA; and Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes, 2006, National Roads Authority. Impacts/effects are generally categorised as either being a direct impact, an indirect impact or as having no predicted impact.

Impacts are generally categorised as either being a direct impact, an indirect impact or as having no predicted impact:

Direct impact occurs when an item of archaeological or architectural heritage is located within the centreline of the proposed route alignment and entails the removal of part, or all, of the monument or feature.

Indirect impact may be caused where a feature or site of archaeological or architectural interest is located in close proximity of the proposed development.

No predicted impact occurs when the proposed route option does not adversely or positively affect an archaeological or architectural heritage site.

These impact categories can be further assessed in terms of their quality i.e. positive, negative, neutral (or direct and indirect).

Negative Impact is a change that will detract from or permanently remove an archaeological or architectural monument from the landscape.

Neutral Impact is a change that does not affect the archaeological or architectural heritage.

Positive Impact is a change that improves or enhances the setting of an archaeological or architectural monument.

A significance rating for these impacts is then given i.e. slight, moderate, significant or profound.

Profound applies where mitigation would be unlikely to remove adverse effects. This is reserved for adverse, negative effects only. These effects arise where an archaeological or architectural site is completely and irreversibly destroyed by a proposed development.

Significant is an impact that, by its magnitude, duration or intensity alters an important aspect of the environment. An impact like this would be where the part of a site would be permanently impacted upon leading to a loss of character, integrity and data about the archaeological or architectural feature/site.

Moderate is a moderate direct impact that arises where a change to the site is proposed which, though noticeable, is not such that the archaeological integrity of the site is compromised and which is reversible. This arises where an archaeological or architectural feature can be incorporated into a modern day development without damage and that all procedures used to facilitate this are reversible.

Slight is an impact that causes changes in the character of the environment that are not significant or profound and do not directly impact or affect an archaeological or architectural feature or monument.

Imperceptible is an impact capable of measurement but without noticeable consequences.

In addition, the duration of Impacts is assessed and has been sub-divided into the following categories:

- **Temporary Impact**, where an Impact lasts for one year or less
- **Short-term Impacts**, where an Impact lasts one to seven years
- **Medium-term Impact**, where an Impact lasts seven to fifteen years
- **Long-term Impact**, where an Impact lasts fifteen to sixty years.
- **Permanent Impact**, where an Impact lasts over sixty years.

6.2 Development Impacts

Potential impacts associated with the proposed development and corresponding impact classifications have been tabulated below in Table 6.

| Area/Feature | Proposed works | Potential Impacts | Classification of Impact |
|-----------------------------------|---|---|---|
| Riverbed/Seabed (River Liffey) | <ul style="list-style-type: none"> • In-river piers to be installed to support proposed SPAR Bridge. • Revetment to be constructed along southern shoreline; reclaiming c. 15m of intertidal foreshore along this section. • Dredging of foreshore to ensure a stable stratum from which the revetment structure can be built; dredging to depth of c. 3m and extending northward from the base of the revetment (toe) by 5m. • Series of new Marina Berths, comprising seven (7) new floating pontoons, to be installed to the west of the existing Poolbeg Marina. • Dredging of Turning Circle to depth of -10mCD at a location opposite Pigeon House Harbour. • Construction of rock armour revetments to protect quay-wall | <ul style="list-style-type: none"> • No known impact to any <u>visible</u> archaeologically or historically significant features. However, the potential for <i>in situ</i>, buried (sub-surface), features still remains. | <ul style="list-style-type: none"> • Direct, negative, impact to any sub-surface features that may be present; moderate and permanent in nature. |

| Area/Feature | Proposed works | Potential Impacts | Classification of Impact |
|--|--|--|--|
| | (Feature F02) on west side of Pigeon House Harbour. | | |
| North Wall Quay Extension (Nineteenth-century masonry quayside on north side of the River). [Feature F01] [DCIHR 18-12-084] [HCS N32] | <ul style="list-style-type: none"> Bridge tie-in/ landing location on NWQE. Bridge tie-in and roadway to transect the adjacent campshire area. | <ul style="list-style-type: none"> Removal of masonry from upper façade of the NWQE, extending across a .c 16m section of quay-wall (Feature F01). Removal of Recessed Mooring Ring (RMR-01). Potential secondary impact to mooring hook MH-02; these items fall outside the impact area, but remain within the development boundary. Ground disturbance to top of quayside with potential to impact buried quayside features within campshire area. | <ul style="list-style-type: none"> Direct, negative, impact to the NWQE; moderate and permanent in nature. Direct, negative, impact to any sub-surface features that may be present; moderate and permanent in nature. |
| Southern Shoreline (rock-armour/ area of reclamation) | <ul style="list-style-type: none"> Bridge tie-in/ landing area, south terminus of SPAR Bridge and associated revetment running along southern shoreline. | <ul style="list-style-type: none"> No known impact to any <u>visible</u> archaeologically or historically significant features; foreshore area retains archaeological potential. | <ul style="list-style-type: none"> Direct, negative, impact to any sub-surface features that may be present; moderate and permanent in nature. |
| Quay-wall, Pigeon House Harbour [Feature F02]. [HCS N79] | <ul style="list-style-type: none"> Extension of existing culvert to allow flow through/over proposed adjacent revetment. | <ul style="list-style-type: none"> Removal of adjacent timber structure (STR-01) required as part of these works. Potential impact to façade of quay-wall (Feature F02). | <ul style="list-style-type: none"> Direct, negative, impact to STR-01 that is moderate and permanent in nature. Potential, in-direct, negative impact to masonry surrounding culvert, slight and temporary in nature. |
| Pigeon House Harbour ; historic quay-walls within existing basin area [Feature F03] | <ul style="list-style-type: none"> No works anticipated within this area. | <ul style="list-style-type: none"> None | <ul style="list-style-type: none"> n/a |
| Great South Wall (Sea wall, Pigeon House Fort to Poolbeg Lighthouse) [DU019-029002-] [RPS 6797] [RPS 6798] [HCS N79] | <ul style="list-style-type: none"> <u>Main Site Access</u>, located at the southeast corner of the Plot N. <u>Blue Light Access</u>, single lane emergency access centrally located at the existing NORA Oil Jetty. <u>Jetty Access</u>, located at the southwest corner of the Plot N, allowing access over the ESB outlet channel to an approach arm to the | <ul style="list-style-type: none"> <u>Main Site Access</u> Bridge to span above the GSW and an adjacent (masonry) slipway (STR-04). The access bridge will require the insertion of a single row of tubular steel piles within the 6m exclusion zone for the GSW. These piles will not impact the | <ul style="list-style-type: none"> Direct, negative, impact to any sub-surface features that may be present; moderate and permanent in nature. Potential, in-direct, impact to the GSW, slight and temporary in nature. |

| Area/Feature | Proposed works | Potential Impacts | Classification of Impact |
|--------------|----------------------|--|--------------------------|
| | relocated ESB Jetty. | aforementioned historic structures. <ul style="list-style-type: none"> • <u>Blue Light Access</u> to locally extend a main deck structure to abut the GSW via a cantilevered deck onto existing abutment level of Oil Jetty. No additional impacts, other than those already associated with the construction of the Oil Jetty anticipated. • <u>Jetty Access</u> is to comprise an approach bridge that span above the GSW and associated exclusion zone. Bridge to tie into the existing road-level located behind earthworks for the adjacent Oil Storage compound. | |

Table 6: Nature and classification of riverine/seabed/foreshore impacts arising from the proposed 3FM project.

7.0 RECOMMENDATIONS

7.1 Pre-construction Measures

The UAIA provides a comprehensive account of the riverine/seabed areas impacted by the proposed 3FM project. This work includes laser-scanning of the NWQE, sections of historic quay-wall at Pigeon House Harbour, and five (5) sections of the GSW where it defines the seaward extent of ESB Poolbeg. The resulting point cloud data provides highly accurate mapping of the features under assessment and a detailed baseline from which to add further detail as/when required. As such, pre-construction archaeological mitigation is now limited to the gathering of supplementary survey data at the locations of three (3) access routes onto the proposed quayside/hardstand area at Plot N. As specific engineering details, relating to the design of these access structures, becomes available, it is recommended that additional (localised) high-resolution laser-scanning of the areas surrounding the access routes is carried out; ensuring that the archaeological record for those areas is as robust as is possible. No other ameliorative measures are recommended in advance of construction work commencing.

In the event that in-river/quayside preparatory works and/or further geotechnical site investigation works are required in advance of construction, Archaeological Monitoring of these works would be required. In addition, should any alterations to the current project

design take place, extending the proposed impacts outside the limits of survey area identified for the current UAIA, additional archaeological assessment/reporting would be required in advance of construction taking place.

7.2 Construction Phase Measures

An Archaeological Management Plan (AMP) is to be prepared to inform the project throughout its lifetime, including construction, operation and decommissioning phases, and will be reviewed and updated at regular intervals. This will follow on from the management plan devised for the preceding port development projects.

Archaeological Monitoring is the primary construction phase mitigation measure. This work is to be undertaken by suitably qualified and experienced maritime archaeological personnel.

The **NWQE** will be directly impacted by the proposed SPAR Bridge; masonry from a c. 16m section of the quay wall being subject to removal. This section of the NWQE (**Feature F01**) has been recorded in detail as part of the UAIA. Archaeological Monitoring of all excavation works and/or interventions upon/alongside the historic quay structure is required. This is to include any excavation work carried out within the *campshire*, comprising the area between the quay-wall and adjacent port buildings. This will ensure that appropriate recording of the internal fabric of the quay structure and any associated (buried) features is undertaken during the construction process.

The removal of quayside masonry from the quay-wall should be carried out under archaeological supervision, allowing additional information to be gathered and supplementary recording to be made, as may be required during that process. It is also recommended that this masonry is retained and placed in suitable storage as part of the removal work. In addition, any quayside fixtures or fittings that are subject to impact should be removed under archaeological supervision, and retained as part of the development; including a recessed wrought iron mooring-ring (**RMR-01**) that lies within the footprint of the proposed bridge landing point.

Archaeological Monitoring of the southern bridge tie-in location is also recommended, ensuring any potential sub-surface material, deposits, or features that may be present are dealt with in an appropriate manner.

It is understood that impacts to the exposed section of historic quay-wall (**Feature F02**), forming the seaward side of Pigeon House Harbour, will be in-direct and restricted to an existing culvert that runs through that structure. Any works in the vicinity of **Feature F02** are to be subject to Archaeological Monitoring, and in the event that further sections of this

feature are to become exposed, additional archaeological recording of the structure is to be carried out. An associated timber structure (**STR-01**) is to be removed as part of the works and this undertaking is also to be Archaeologically Monitored, with its structural elements (timber pieces/ iron fastenings) being retained for additional assessment/recording.

No direct impacts to the **GSW** are anticipated. However, all works located within proximity the **GSW**, including its associated exclusion zone, are to be subject to Archaeological Monitoring, ensuring that the sea-wall remains unaffected by the proposed development within Plot N. Where removal of the Oil Jetty, ESB jetty, and any other structures takes place, exposing previously obscured sections of the GSW, the opportunity to undertake additional detailed (laser-scan or similar) survey should also be provided for.

All Marine Dredging carried out as part of the proposed 3FM project is to be subject to Archaeological Monitoring, following the same protocols used for the Capital Dredging undertaken as part of the preceding ABR and MP2 projects.

The archaeological work should be carried out in accordance with the terms of Section 5 of the National Monuments Act (2004 Amendment).

RETAINING AN ARCHAEOLOGIST/S. An archaeologist should be retained for the duration of the relevant works. The archaeologist should be familiar with and experienced in river/estuarine environments and have a good understanding of riverine archaeology and its associated features.

THE TIME SCALE for the construction phase should be made available to the archaeologist, with information on where and when ground disturbances and/or dredging will take place.

SUFFICIENT NOTICE. It is essential for the developer to give sufficient notice to the archaeologist/s in advance of the construction works commencing. This will allow for prompt arrival on site to monitor the ground disturbances. As often happens, intervals may occur during the construction phase. In this case, it is also necessary to inform the archaeologist/s as to when ground disturbance works will recommence.

DISCOVERY OF ARCHAEOLOGICAL MATERIAL. In the event of archaeological features or material being uncovered during the construction phase, it is crucial that any machine work cease in the immediate area to allow the archaeologist/s to inspect any such material.

ARCHAEOLOGICAL MATERIAL. Once the presence of archaeologically significant material is established, full archaeological recording of such material is recommended. If it is not

possible for the construction works to avoid the material, full excavation would be recommended. The extent and duration of excavation would be a matter for discussion between the client and the statutory authorities.

ARCHAEOLOGICAL TEAM. It is recommended that the core of a suitable archaeological team be on standby to deal with any such rescue excavation. This would be complimented in the event of a full excavation.

SECURE SITE OFFICES and facilities should be provided on or near those sites where excavation is required.

FENCING of any such areas would be necessary once discovered and during excavation.

ADEQUATE FUNDS to cover excavation, post-excavation analysis, and any testing or conservation work required should be made available.

MACHINERY TRAFFIC during construction must be restricted as to avoid any of the selected sites and their environs.

SPOIL should not be dumped on any of the selected sites or their environs.

PLEASE NOTE: All of the above recommendations are based on the information supplied for the proposed Dublin Port 3FM Project. Should any alteration occur, further assessment maybe required.

PLEASE NOTE: Recommendations are subject to the approval of The Department Housing, Local Government and Heritage.

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Appendix 1-A: Shipwreck events listed in the Shipwreck Inventory for the River Liffey/Dublin Port.

| Location | Name | Date | Ship Type | Information |
|---|-------------------------------|--------------|---|---|
| Poolbeg Harbour | <i>Aldeborough</i> | 4/1725 | Man-of-War | This British 'man of war' sank during a storm. |
| Ringsend Point | <i>Antelope/ Antelope</i> | 27/9/1852 | ---- | This vessel of Dublin was en route from New York. |
| Poolbeg | <i>Apollo</i> | 30/1/1799 | Brig | This brig had its cables cut. |
| Opposite the old coastguard station at Ringsend, River Liffey | <i>Argo</i> | 10/12/1892 | 31-year old, 46-ton, Dublin, wooden fishing smack | Moored in the River Liffey. |
| Pigeon House | <i>Ashbourne</i> | 1832 | ---- | The captain of the vessel was Bennest of Gibraltar. The vessel was last seen at the Pigeon House and has not been seen since. |
| Pigeon House | <i>Belle Kate</i> | 17/12/1851 | ---- | This barque ran aground as she came up the harbour. However, she is recorded as having been got off again. |
| Between the walls at Dublin | <i>Britannia</i> | 6/5/1774 | ---- | This vessel was en route from London, under Captain Williams, when she hit an anchor. She went ashore. |
| River Liffey | <i>Carolina</i> | 5/10/1799 | Galliot of Oporto | Ran aground and sank. |
| Dublin River | <i>Commerce</i> | 25/10/1811 | ---- | En route from Dublin when sank. |
| Pigeon House | <i>Dorset</i> | 26/3/1804 | Yacht | This yacht was damaged by a brig but was expected to be able to continue. |
| c. 0.5 miles north of Pigeon House Fort/ south bank of the River Liffey; near Pigeon House. | <i>Duke of Leinster</i> | | Steamer | This screw steamer was en route from Dublin to Glasgow when she struck a sunken dredge while leaving port. The dredge's anchor caused a 60-foot gash in her side and she sank. Around ten days later the wreck was raised and beached on the south bank of the River Liffey |
| Poolbeg | <i>Dunbar</i> | 20-22/2/1756 | Brig | This brig of Dunbar was en route from Dublin to the Western Isles when she sank. |
| Between the city of Dublin Company's jetty and breakwater head. | <i>Edith</i> | 8/9/1875 | London and Noth-Western Railway Company Steamer aboard. | En route from the company's wharf to Greenore. She departed at around 1.25am but collided with another London and North-Western Railway Company vessel, the Duchess of Sutherland. This vessel was under the |

| Location | Name | Date | Ship Type | Information |
|----------------------------------|-------------------------|------------|-----------|---|
| | | | | command of Captain Beaumont and was en route from North Wall Dublin. The Edith was violently struck on the starboard bow and sank within a quarter of an hour. A fireman called Jones and his brother who slept in the forecastle were drowned. The weather was clear and calm at the time of the incident. Cargo: 60 to 80 passengers |
| Pigeon House Fort | <i>Emerald</i> | 2/7/1898 | Ketch | This 51-ton wooden ketch of Dublin was engaged in fishing when she collided with the steamship <i>Carlou</i> and was lost. |
| Sir John's Quay, Dublin | <i>Emma</i> | 17/06/1851 | Smack | En route from Liverpool ran aground and listed on her beam ends. She was seriously strained and brought to Eden Quay where she filled. The cargo was damaged. Cargo: Wheat and staves |
| Near the lighthouse, White Bank | <i>Flyde of Preston</i> | 11/10/1824 | ---- | This vessel was lost. |
| Poolbeg | <i>Friendship</i> | 22/11/1798 | Sloop | This sloop of Barmouth was lost after her cables were cut. |
| White Bank | <i>Glory</i> | 26/9/1805 | ---- | This vessel was en route from Glasgow when she went ashore. |
| Off Pigeon House | <i>Governor Picton</i> | 26/8/1799 | ---- | This ship of Antigua ran aground and sank. |
| Opposite Pigeon House | <i>Henrietta Louisa</i> | 23/9/1799 | Brig | This brig of Dantzic had its cables cut. |
| Back of the piles at Dublin Port | <i>Henry</i> | 12/01/1767 | ---- | This vessel was wrecked. |
| South Wall | <i>Henry</i> | 23/11/1798 | Brig | This brig of Liverpool was wrecked. |
| River Liffey | <i>Hibernia</i> | 22/03/1776 | ---- | Vessel was burnt |
| Pigeon House | <i>Hero</i> | 11/10/1824 | ---- | This vessel hit a sand bar and sank. |
| Poolbeg | <i>Isabella</i> | 26/7/1811 | ---- | This vessel was en route from Sicily to Dublin when she became stranded. |
| Pigeon Hole, Dublin River | <i>James and Ann</i> | 7/2/1812 | ---- | En route from Drogheda was hit by a collier brig and sank. |
| 'Dublin River' | <i>Langston</i> | 21/03/1812 | ---- | Portsmouth vessel was reported lost. |
| River Liffey, | <i>Leonard</i> | 10/01/1853 | ---- | Struck by a steamer. |

| Location | Name | Date | Ship Type | Information |
|--|-------------------------------|-------------|---|--|
| Dublin | | | | |
| Poolbeg | <i>London Packet</i> | 8/2/1798 | ---- | This ship of London became stranded and sank. |
| Entrance to Dublin River | <i>Maria Carolina</i> | 16/8/1799 | ---- | En route from Oporto to Dublin when she sank. The cargo was landed. |
| Abreast of No. 2 Buoy, River Liffey | <i>Mermaid</i> | 16/07/1892 | Unregistered wooden yacht/cutter was 5-yrs old and weighed 1 ton. | The master and owner was P. Carolan, Clontarf, Dublin. She was en route from Clontarf to Dublin, in ballast, with 6-crew. She sank in an easterly force 6 wind but was later raised. 4 lives were lost |
| The Liffey | <i>Newport</i> | 20/05/1851 | Montrose schooner | En-route up the Liffey when she came in contact with Hebden from Barbados, which made a hole in her stern. |
| Dublin River | <i>Nosha Squera de Bonamo</i> | 28/06/1798 | Brig of Oporto | Ran onto a bank. |
| Ringsend, R. Liffey | <i>Pelican</i> | 8/4/1889 | 37-ton 32-year old wooden smack of Dublin | At anchor at Ringsend when burnt. Vessel in ballast. |
| Shally Banks, south of ESB power station, Poolbeg. | <i>Poseidon</i> | c. 1907 | Barque | This Norwegian barque went ashore and remains are said to protrude from the sands. |
| Poolbeg | <i>Polly</i> | 25/4/1775 | ---- | This vessel was en route from London when she sank. |
| White Bank | <i>Princess Augusta</i> | 6/12/1819 | ---- | This vessel was en route from Dublin to London when she ran ashore. |
| Near Pigeon House | <i>Prosperous</i> | 21/07/1854 | Smack | This smack of Courtown was en route from Dublin to Holyhead when she sank after colliding with the <i>Hibernia</i> . |
| Behind piles at Dublin | <i>Providence</i> | 5/02/1771 | ---- | En route from London, when she was lost |
| Poolbeg | <i>Providence</i> | 16/11/1779 | ---- | This vessel was under the command of Maine when she was lost. |
| Opposite Halpins Pond, River Liffey | <i>Rat</i> | 25/05/1891 | 10-year old wooden pleasure sailing boat | Capsized and was wrecked during pleasure trip. |
| Off Ringsend | <i>Seaflower</i> | 24/1/1856 | ---- | This vessel of Dublin broke from her moorings and ran into the steamer <i>Liffey</i> |
| River Liffey | <i>Times</i> | 1-2/06/1853 | Dublin vessel | En route from Dublin to Liverpool encountered easterly wind. Her boilers burst while in river. Cargo: Passengers |

| Location | Name | Date | Ship Type | Information |
|---|------------------------|------------------|-----------|---|
| Off Pigeon House | <i>Times</i> | 13/09/1851 | Steamer | This steamer went ashore in dense fog but was got off again. |
| Off Pigeon House | <i>Seaflower</i> | 13/09-29/11/1851 | Steamer | Steamer plying to and from Dublin went ashore but got off again after discharging some cargo. |
| Poolbeg | <i>Speculation</i> | 12/10/1799 | ---- | This ship had her cables cut. |
| Near Pigeon House | <i>Wellington</i> | 1/12/1825 | Steamer | This steamer went ashore in dense fog but was got off again. |
| Poolbeg | <i>William</i> | 01/1609 | ---- | This vessel of Ayr was at anchor when she was lost in a storm. |
| Dublin River | <i>William</i> | 10/01/1812 | ---- | Went aground. |
| Poolbeg Harbour | <i>Wilmington</i> | 2/2/1791 | ---- | This vessel was en route from Philadelphia to Belfast when she was wrecked. |
| Ringsend | Unknown | 1760s (Oct.) | ---- | A severe gale in Dublin Bay wrecked two ships. |
| Poolbeg | Unknown | 1524-1561 | ---- | The Mayor took charge and returned goods from a wrecked ship to the merchant concerned. |
| Poolbeg | Unknown | 01/1608 | ---- | Unknown |
| Poolbeg | Unknown | 17-20/02/1770 | ---- | This stoop from Wales sank. |
| Behind the piles at Dublin | Unknown | 5/2/1771 | ---- | Two unnamed ships were lost |
| c. 0.5 miles north of Pigeon House Fort | Unknown | 22/10/1883 | Dredger | This dredger collided with the 60-ton collier <i>Annie</i> and sank. The dredger's anchor caused the <i>Duke of Leinster</i> to sink. |
| Ringsend Basin | Unknown | 2/1900 | Trawler | This first-class sailing trawler was damaged and lost when she collided with a steamship. |
| Poolbeg | Unknown | ---- | ---- | Six boat timbers were exposed in a sewage trench dug by a dredger. |
| Dublin River | <i>Usk</i> | 8/10/1856 | ---- | This vessel, en route from Dublin to Wexford, became stranded. |
| Poolbeg | <i>Young Christian</i> | 17/4/1799 | ---- | This vessel of Tidrickstol had her cables cut |

Appendix 1-B: Known shipwrecks located with a 1km radius of the riverbed/seabed areas under assessment.

| Registration No. | Location/ ITM | Description |
|--|--|---|
| W01145 | North Bull [721822E, 735178N] | One of five (5) wrecks plotted on William Bligh's 1803 map of Dublin Bay. It is the most southerly wreck of the North Bull wrecks as indicated on the map and is located close to the low water mark. |
| W01466 | North Bull [721344E, 734906N] | One of ten (10) wrecks marked on John Vernon's estate map of the North Bull. It is located towards the southern end of the North Bull, close to a small creek. |
| W01465 | North Bank [721016E, 734633N] | <p>This vessel was subject to investigation and detailed recording by the report author (08E0497, 08D038, 08R109). The wreck lies partially buried within a large sandbank, approximately 450m east of the current reclamation extent of the North Port. It is orientated in a northeast to southwest direction with the bow located to the south, and the stern to the north.</p> <p>The wreck remains in a medium-good state of preservation and, despite severe erosion of any exposed timbers, those timbers that remain buried were found to be in a good state of preservation. The western side of the vessel remains partially intact, lying heeled-over onto its starboard side with the <i>in-situ</i> keel timber leaning at approximately a 45° angle towards starboard. It is evident that the <i>tumblehome</i> (curvature) of the starboard side of the hull is no longer intact, the structure having flattened-out within the sandbank. A single <i>in-situ</i> planking timber remains on the eastern (port) side of the keel, along with a couple of disarticulated planking timbers. The hull is of carvel (edge fastened) construction, held in place by robust composite framing timbers that provide structural integrity to the vessel.</p> <p>The main components of the vessel are all composed of hardwood (oak) timbers, only the possible timber sheathing (<i>furring</i>) being composed of a softwood species. The vessel lies disarticulated into three wreck sections: Wreck Section 1 defines the eastern extent of the site, Wreck Section 2 the western limit of the site, and Wreck Section 3 the northwest limit of the site.</p> <p>Key <i>in-situ</i> components of the vessel include the keel, fore/aft deadwood timbers, flooring timbers, ceiling planks, and outer planking timbers. The vessel's keel remains intact and allows a vessel length to be extrapolated; likely being c.20-25m (c.65ft-82ft) in overall length. Vessel construction and the presence of <i>furring</i> suggest that the wreck is of eighteenth to early nineteenth-century in date. The wreckage is from a <i>hooker</i>, <i>cutter</i>, <i>lugger</i>, or <i>smack</i> type vessel; vessel types that comprised of single-hold with single overlying deck area. No mast-step(s) is present within the visible wreck assemblage and, as such, it is not possible to ascertain the nature of the vessel's rigging elements. The rigging may have consisted of a single main-mast, a main and topmast configuration, and in the case of a <i>hooker</i> a possible pole-mast.</p> |
| Redep. W11566 W11567 W11568 W11569 | South Bull [721240E, 733411N] [721221E, 733411N] [721208E, 733412N] [721181E, 733409N] | Re-deposition location of ships' timbers that were recovered during marine dredging associated with the Cross Bay Sewer project have been reburied for archaeological storage (W11566, W11567, W11568, W11569). The timbers are located in four locations that are spaced some 15m apart over a 50m-wide area. These sites are to be regarded as artefact repository locations. |

| | | |
|--|---|--|
| <p>W01734 [W11570] [W11571]</p> | <p>South Bull [721314E, 733325N] [721342E, 733350N]</p> | <p>Wooden wreck that was exposed during dredging operations in 2001 (01E0402) and is known as the 'Ringsend wreck'. The vessel is oriented east-west and is a composite construction of timber and metal. A keelson was observed in 2001, and it is of carvel construction. Musket balls and bullets were recovered from the area, indicating that a debris field should be considered associated with the site that extends some distance away from the vessel's remains. There are two other locations associated with wreckage from the same site: W11570 and W11571.</p> |
|--|---|--|

Appendix 2: Artefact Entries from the Topographic Files at the National Museum of Ireland listed for the areas under assessment.

| NMI Reg. No. | Artefact | Find place | Description |
|--------------|-----------------------|----------------------------|--|
| 4042:WK428 | Glass Bead | River Liffey | Found with other beads and an iron sword pommel |
| 4041:WK427 | Glass Bead | River Liffey | Found with other beads and an iron sword pommel |
| 4034:WK420 | Glass Bead | River Liffey | Found with other beads and an iron sword pommel |
| 4034:WK419 | Glass Bead | River Liffey | Found with other beads and an iron sword pommel |
| 4031:WK417 | Glass ring | River Liffey | Found with other beads and an iron sword pommel |
| 4030:WK416 | Glass Bead | River Liffey | ----- |
| 4029:WK415 | Glass Bead | River Liffey | ----- |
| 1964:1 | Iron sword, Sudanese? | River Liffey at Arran Quay | Found in the bed of the River Liffey about 10ft out from the edge at Arran Quay. It is Sudanese dating from fourteenth to nineteenth century. Length 100cm, length of blade 88cm, width across cross-guard 15.5cm. The blade is long tapered and flexible tapering to a blunt rounded point. |
| 1954:168 | Knife | East Wall | Tanged iron knife. found in foundation trench for church, East wall. |
| RIA 1918:368 | Bead | Pigeon House Fort | Glass bead, blue with white and blue ridges and white/blue spiral knobs. |
| 1954:004 | Jug | Pigeon House | Medieval ceramic jug sherd, found in gravel below estuarine clay, Pigeon House. |
| 1970:190 | Clay Pipe | Near NWQE | Clay pipe bowl; dredged-up from sunken vessel/boat, north side of channel, near the NWQE. |
| 1970:191 | Pottery | Near NWQE | Pottery fragment, rimsherd; dredged-up from sunken vessel/boat, north side of channel, near the NWQE. |
| 1970:192 | Horse-shoe | Near NWQE | Portion of thin copper vessel; rimsherd; dredged-up from sunken vessel/boat, north side of channel, near the NWQE. |

Appendix 3: Summary of licenced archaeological work carried out within the vicinity of the project areas under assessment.

| Licence No. [Entry no.] | Licence Holder | Location | Description |
|------------------------------|--|------------------------------------|---|
| 01E1004 [2001:358] | Simon Ó Faoláin, Eachtra Ltd. | Dublin Port; Navigation Channel | Maintenance dredging was conducted eastwards from the EastLink toll-bridge for c. 10km. The docks area immediately to the east of the toll-bridge was intensively dredged and the river channel deepened out to the mouth of the harbour (marked by the Poolbeg and North Bull lighthouses). Dredging of the channel was continued through the sandbank out into the shipping fairway for a distance of c. 4km. No material of archaeological significance was encountered. |
| 01E0402 [2001:495] | Erne Dennehy, Eachtra. | South Bull; Ringsend | During the course of a foreshore assessment associated with the excavation of a pipeline trench in the intertidal zone from Ringsend to Sutton, an undated wreck was identified. A licence to test-excavate was obtained to determine the extent and nature of the wreck. Nine trenches were excavated around the potential wreck. Of these, six were excavated in the immediate vicinity of the site and three on the boundary of the buffer zone to determine whether the 40m exclusion zone was sufficient. The first six trenches determined that a wooden and metal shipwreck incorporating wooden dowels was present. The last three trenches testing the buffer zone proved archaeologically negative. It was, however, recommended that the buffer zone be increased to 60m in a western direction to preserve the wreck in situ. Two sump trenches were also excavated, one to the west and one to the north-west of the wreck site. No archaeological stratigraphy was identified but a number of spent bullets and musket balls were recovered. |
| 03E0654 [2004:565] | Melanie McQuade, Margaret Gowen & Company Ltd. | North Wall Quay; Spencer Dock | Monitoring and excavation were carried out on the site of Building C, Spencer Dock, North Wall Quay, Dublin 1, between January and September of 2004. Three principal phases of activity were uncovered. Monitoring on the site of a northern block (RSTUV) is ongoing. To date, 19th-century foundation remains have been uncovered. The results of monitoring on this block will be reported in Excavations 2005. <i>Late Mesolithic</i> The earliest phase relates to fishing and other activity carried out when the Liffey estuary occupied the south of the site. The transition of silt and gravels uncovered between 13-16m north of the southern limit of excavation marked the old shoreline of the Liffey channel. The remains of wooden fish traps, stake rows and miscellaneous pieces of worked wood were preserved in the waterlogged silts. A semicircular wicker structure or fish trap comprised stakes and a series of smaller upright rods, around which rushes had been woven. A radiocarbon date of 6090-5840 cal. BC was returned for this feature. Along the shoreline to the south-west of the fish trap was a deposit of horizontally set roundwoods. These were truncated to the east by machine excavation, but the remains covered an area 3.4m by 1.28m and have been radiocarbon dated to 6070-5890 cal. BC. In the south of the site was a row of 36 stakes aligned northeast/south-west; a date of 5920-5720 cal BC was obtained for one of these stakes. Along the western shoreline, to the north of the western stakes, were the remains of a wicker-basket type structure and a group of stakes. The structure, which survived up to 0.6m long and 0.3m wide, has been dated to 5990-5750 cal. BC. On the west of the site were two rows of rods and stakes, a horizontal panel of wicker (dated to 6100-5970 cal. BC) and a fragmentary wicker fence, which were probably part of a truncated fish trap. The fish traps were constructed mainly but not exclusively of hazel and were in a good state of preservation. In addition, there were several other stakes and pieces of worked wood, which did not form any coherent structures. Phase 2 was the reclamation of land from the estuary and its floodwaters. This was achieved by depositing a series of fills in |

| Licence No. [Entry no.] | Licence Holder | Location | Description |
|----------------------------|--------------------------------|---|---|
| | | | <p>order to build up the ground. Artefacts recovered from these reclamation deposits have been dated to the 18th and 19th centuries and corroborate with the documentary sources in indicating the date when this work was carried out.</p> <p>The third phase was the development of the reclaimed land. From the later 18th up to the 20th century a series of structural remains were founded on the reclamation deposits and the site was drained by a series of brick culverts cut into these deposits. In the south of the site, c. 112m to the east of the canal and 45m north of where the canal opens into the Liffey, were the remains of a circular masonry structure. This had an internal diameter of 11.2m and its encircling wall was constructed of limestone blocks (0.35m by 0.22m by 0.16m), bonded with mortar. The wall was 1m wide and survived to a maximum of 1m in height. In the west was an entrance. Leading from the western entrance was a walkway, which comprised two rows of granite slabs on either side of which was a red-brick floor (6.1m by 5.1m) and to the west were four sandstone slabs. To the east of the floor and abutting the external wall was a north-south masonry wall with an eastern return at its north. This was probably an internal division within the circular structure. This was the earliest masonry structure uncovered on site. Its location roughly corresponds with the windmill at North Wall Quay, which was recorded as being 100m east of the mouth of the Royal Canal. The windmill had burned down in a spectacular fire late in 1810 but is shown on Taylor's map of 1816. The inclusion of the windmill on Taylor's map suggests that it was reconstructed after the fire of 1810. However, it is not shown on the first-edition OS map (1837), which shows a warehouse on the same location. The western wall of this warehouse was uncovered during site works, partly overlying, and therefore post-dating, the windmill wall. The archaeological evidence corroborates the cartographic evidence in indicating an early 19th-century date for the windmill. It was larger in diameter (11.2m) than typical tower mills (4-6m). Its location on low-lying ground, which was prone to flooding, suggests that it may have served for pumping and draining water rather than milling corn.</p> <p>To the north, west and south of the windmill structure were a series of 19th- and 20th-century walls and basement floors, which largely corresponded with the structures shown on the OS maps. A series of five arched vaults was uncovered along the street front and extending under the road, south of Nos 46 and 47 North Wall Quay. The vaults extended for c. 16m east-west and were accessed from the north through an arched corridor. The individual vaults measured c. 3m long and 3.2m wide and the corridor was c. 1.5m wide. The vaults were constructed of limestone blocks bonded with mortar.</p> <p>Red and yellow brick used in the upper structure of the walls may represent modifications to the original structure. These vaults were filled in and remain in situ.</p> |
| 04E0740 [2004:579] | Jacinta Kiely, Eachtra Ltd. | Poolbeg Yacht and Boat Club, Pigeon House Road. | <p>Monitoring was carried out of dredging work at Poolbeg Yacht and Boat Club, in association with the development of a marina on the River Liffey in Dublin Port. The monitoring of back-hoe dredging was achieved through constant visual inspection of the excavator bucket as it came out of the water and deposited each load in the barge alongside. In addition, the barge, the dredger and the excavator's cab contains a computer screen showing the image of the surrounding seabottom with depths indicated, as well as the position and depth of the excavator bucket at any time, and this was accessible to the archaeologist. This computer also shows the depths to which the surrounding substrate has been dredged.</p> <p>The dredged material consisted of two layers. The upper layer consisted of a soft brown silt with much modern debris. This debris included several modern mooring blocks, engines and tyres. Three modern vessels were recorded within this layer. The underlying stratum was sterile grey silt. No archaeological stratigraphy or finds were uncovered during monitoring.</p> |
| 06E0926 | Ciara | North Wall Quay. | <p>A programme of monitoring was carried out at the site of the Liffey Services Tunnel, North Wall Quay and York Road, Dublin.</p> |

| Licence No. [Entry no.] | Licence Holder | Location | Description |
|--|---|---|---|
| [2007:491] | McCarthy, Arch-Tech Ltd. | York Road | <p>The services tunnel is located within the 'historic city of Dublin', DU018-020. The development involves the construction of a shaft on North Wall Quay and the use of an existing shaft on Sir John Rogerson's Quay. A culvert extending from the southern shaft to York Road will also be constructed. Two locations have been investigated for the shaft on the North Wall Quay. Obstructions met while excavating the initial shaft meant work on that shaft had to be abandoned.</p> <p>The first shaft on the North Wall Quay comprised the construction of a reception shaft, 6m in width and 25m in depth. The shaft was excavated using the caisson sinking method. A possible masonry wall was identified at a depth of 4m. It was visible within the shaft for a length of 3m and was 0.5m in width. It is possible that the wall represents the remains of an 18th-century quay wall. However, at this depth the shaft was waterlogged and inaccessible.</p> <p>The excavation of the shaft was abandoned at a depth of 5m. Dublin City Council proposed a second shaft location 6m west of the initial shaft.</p> |
| 08D0038 08R0109 [2008:402] [2008:403] [2008:404] | Rex Bangerter, ADCO Ltd. | Dublin Port; North Side of Channel | <p>Construction of the second shaft commenced in October 2007. An area of 12m east-west by 8.2m was excavated to a depth of 2.2m to identify services in order to reroute them. During the course of this work, a masonry wall bonded with mortar was identified. The top of the wall was visible at a depth of 2m below the pavement. A section of fill was excavated to a depth of 3.7m below the level of the pavement to reveal the north-facing section of the wall.</p> <p>The wall was oriented east-west and runs parallel to the existing quay wall at a distance of 2.8m. The wall was visible for a length of 8.2m and measured 1m in width. The wall was constructed of limestone blocks of various sizes and bonded with a lime-based mortar. The wall was faced on the inner north-facing section and rough on the outer south-facing section.</p> <p>Underwater inspection of series of marine geophysical anomalies located within the proposed development footprint of the proposed Dublin Gateway Project. A marine geophysical survey of the development area identified a total of one hundred and thirty (130) targets, fifty-one (51) of which were located within the proposed seabed reclamation area and thirty-two (32) that were located within the approach channel/turning circle for the port extension. A total of seventy-five (75) side-scan sonar targets and three (3) magnetometer hits were visually inspected.</p> |
| 08D067 08R206 [20080:484] | Rex Bangerter, ADCO Ltd. | River Liffey, Poolbeg, Dublin WWTP. | <p>Detailed archaeological recording of known wreckage located 65m west of the eastern limit of the proposed reclamation area was also carried out. The wreck correlates to side-scan anomaly S23b, listed in the marine geophysical survey report as a 'high backscatter linear anomaly on starboard channel, north-north-east/south-south-west orientation'. Vessel construction and the presence of wooden sheathing suggest that the wreck is eighteenth- to early nineteenth century in date. The findings from the wreck inspection and subsequent investigation are detailed in two separate archaeological reports.</p> |
| 09E0022 [2009:354] | Melanie McQuade, Margaret Gowen and Company | Pigeon House Road | <p>Non-disturbance underwater assessment of a 40m by 10m area of the River Liffey was required as part of the pre-construction requirements identified for the proposed Dublin Waste Water Treatment Plant at Poolbeg, Dublin Harbour. A visual inspection and metal-detection survey of the footprint of the proposed intake/discharge pipeline was undertaken. In addition, a buffer zone was incorporated into the survey, significantly extending the survey area either side of the proposed pipeline; the extended survey area measuring 160m (north-south) by 40m. No archaeologically significant material, structures, or deposits were encountered as part of the survey.</p> <p>Site investigations were carried out to the north of Pigeon House Road recorded sea wall and embankment (DU019-029). Subsurface walls of concrete construction were exposed between 0.3m and 0.5m below present ground level. The walls were 0.4m wide and c. 1.2m high. They were orientated north-south and north-east/south-west. These structures are located on an area of land that was reclaimed in the late 19th century and thus must be late 19th- or more likely early 20th-century in date. They may be associated with the early 20th-century outfall works shown in that area on the 1912 OS map.</p> |

| Licence No. [Entry no.] | Licence Holder | Location | Description |
|----------------------------|--|-------------------|--|
| 09E0259 [2009:357] | Ltd. Antoine Giacometti, Arch-Tech Ltd. | Pigeon House Fort | <p>The Pigeon House Fort complex on the South Wall of the Poolbeg Peninsula in Dublin Bay represents a unique and little-known part of both civic and national heritage, spanning the critical period from the late 18th century to the early decades of the Irish State. An archaeological and architectural survey, which included a detailed inspection of the site, a digital, drawn and photographic record of the accessible portion of the standing remains, an architectural inventory, conservation assessment of degradable features, and small-scale vegetation clearance and subsurface archaeological investigations, was conducted on the site. The existing extent of the monument on the ground was defined, and its constituent features along with areas of potential subsurface archaeological material were identified.</p> <p>The Pigeon House area was used as a landing place from at least the late 17th century, when it was known as the 'Green Patch'. During the 18th century, when the Great South Wall was constructed, this informal landing point was improved with the construction of a harbour. The harbour had a building (now demolished) called the blockhouse, which was used as a storehouse serving the harbour. In 1761, John Pidgeon became its resident supervisor and caretaker. Many of the people passing through here would stop for refreshments at the resting place established by Pidgeon and his family, and the blockhouse became known as the Pigeon House. A small part of this building may be visible in the existing gatehouse structure. The Pigeon House harbour was continually improved during the mid-and late 18th century, with new wharfs, harbour walls, accommodation, a revenue barracks and storehouse. These improvements culminated in the construction of the ornate and imposing Pigeon House Hotel in 1793.</p> <p>As a result of the 1798 uprising, the Pigeon House precinct, which was deemed a worthy stronghold, became occupied by the military. This phase in the area's history witnessed the increased development of the site as buildings necessary for military occupation, such as soldiers' quarters, stores, magazines, a hospital, a canteen, a handball alley, a prison and water tanks, were gradually added. Defensive measures such as gateways at each end of the South Wall protected by trenches and drawbridges, an armoury and guardhouse commanding the road from Ringsend and guns trained on the South Bull sands and the mouth of the River were also instituted. This site was henceforth known as Pigeon House Fort. In the late 19th century military occupation of the area was no longer deemed necessary and it was sold to Dublin Corporation.</p> <p>Much of the northern end of the fort is now taken up by the large red brick Pigeon House power plant constructed in 1903. This is a huge, iconic and genuinely fantastic building of great significance for the industrial heritage of Dublin, which, alas, is in a terrible condition.</p> <p>The project concluded that the western gatehouse of the fort, in particular, could be converted into a visiting and orientation space for the fort complex as a whole with relatively little further work or expense. Small measures, such as the erection of signage and historical information outside and within the small guard-hut, the replacement of the stolen granite paving and balustrade capping using the granite owned by DCC and stored near the site, and the relocation of the cannons to the gatehouse, could transform this area from a rundown ruin into a historic monument marking the old entrance to the artillery fort providing information to visitors on the fort and its components.</p> |
| 12E0126 [2012:211] | Fintan Walsh, IAC Ltd. | North Wall Quay | <p>A programme of monitoring was carried out during works associated with the North Wall Quay Environmental Improvement and Bus Priority Scheme. Continuous monitoring of all ground disturbances was undertaken over the course of five months between April and August 2012. A total of six walls were identified within the trench located on the north side of street along North Wall Quay (Wall A-F). The most substantial of these was an east-west running wall (Wall A) which ran the length of the development works parallel to the current quay face (c. 460m in length). The wall was located c. 25m north of the current</p> |

| Licence No. [Entry no.] | Licence Holder | Location | Description |
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| | | | <p>quay and was identified c. 0.55m beneath the current ground surface.</p> <p>The wall had a depth of at least c. 4.3m and had a slight batter on the north face. The total depth of the wall was not identified during excavations. Brookings Map of 1728 shows the first depiction of the reclamation of the North Lotts, including a wall to the north of the quay wall, which formed a causeway. The quay was later rebuilt in the 19th century and it is probable that Wall A represents the back (or northern) wall of the late 19th-century quay structure. However it cannot be ruled out completely that the wall represents the earlier 18th-century structure. A further east-west running wall (Wall B) was identified to the immediate north of Wall A. This wall consisted of large stone blocks located beneath the surface of the road; however it was shallow and only survived as a number of courses. Four additional north-south running wall foundations (Wall C-F) were identified running at right angles to Wall A. These were not substantial in size and were in poor condition. Walls B-F represent the remains of pre-existing structures shown on North Wall Quay on the early 19th century maps.</p> |
| 13E0066 [2013:282] | Fintan Walsh & David McIlreavy, IAC Ltd. | Poolbeg | <p>Monitoring of site investigation trenches was undertaken at the site of the Dublin Waste to Energy Project, Poolbeg, Dublin 4 between September and December 2014. Monitoring of ground works and site investigations was recommended in an EIS undertaken for the project in 2006. Site investigations were conducted over two phases in the area of the Dublin to Waste development site. In total 23 test trenches were excavated, ten in Phase 1, 13 in Phase 2. The majority of the trenches encountered significant modern fill deposits associated with estuarine land reclamation south of the modern Pigeonhouse Road. Test trenches excavated as part of Phase 2 (Test trenches 12 and 13) exhibited the partially truncated remains of a metallised surface and walling. These remains are considered to have formed part of the causeway which led to the 19th-century Pigeonhouse Fort. Both test trenches were only excavated to a depth where extant services could be identified. The archaeological remains exposed were covered with a protective layer of sand before backfilling.</p> |
| 15E0454 [2015:175] | David J O'Connor, Magnus Archaeology. | Great South Wall | <p>The site of a coffer dam associated with a pump station for the facility was excavated during October 2015. Significant reclamation deposits overlay navigation channel silts with modern debris inclusions. Nothing of archaeological significance was recovered.</p> <p>Monitoring of ground investigation (borehole) works on the Great South Wall. The GSW differs in height, ranging from 6.5m (3.66m to -2.84m OD) near Poolbeg Lighthouse to 3.5m (2.35m to -1.15m OD) at White Bank Wharf. The wall appears to be of uniform construction throughout its length, built almost entirely of cut granite blocks and stone gravel (shingle) fill. Some limestone and sandstone was also used in the lower layers. Cut granite blocks were set dry on the sea bed, flanked by two retaining walls. The voids between the blocks were filled with stone gravel (shingle). The blocks appear to have been laid in layers. It also appears that up to 6 inches (0.16m) of gravel separated each layer of granite blocks within the core of the wall. In one area sand appears to have been used instead of gravel. The base of the wall sits on up to 10m of sand for its entire length. Strata of gravel, shale and boulder clays occur beneath the sand, while solid rock was found between 30-45m below the top surface of the wall.</p> |
| 16E021 16E021Ext. [2016:397] | Niall Brady, ADOC Ltd. | NWQE/ Crossberth Quay | <p>Site Investigations (SI) to inform the engineering design process for the Dublin Port ABR project. Monitoring has taken place of the SI works, which began on North Wall Quay Extension, continued on Crossberth Quay, and extended to monitoring marine site investigations within the Approach Channel and associated areas. No archaeologically significant material was recovered during this work but a profile of the buried strata is being constructed across the development area based on the SI observations. Monitoring is an ongoing process throughout the project and will continue in 2017.</p> |
| 16E0495 16D0070 | Rex Bangerter, ADOC Ltd. | River Liffey and Quays | <p>On-site work comprised the systematic non-disturbance inspection of the river channel, its attendant quays, and any associated quayside features encountered. The environmental sampling was undertaken in accordance with the specification</p> |

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| [2016:499] | | | <p>outlined by an AECOM environmental scientist, and comprised the gathering of sixteen samples from surface deposits to a depth no greater than 1m. A sample size of was recovered from each location, typically being taken at a depth of c. 0.8m or to refusal. Sample locations were position-fixed using Total Station and DGPS recording, with the resulting data referenced to Irish National Grid, Irish Transverse Mercator, and to Malin Head Ordnance Datum.</p> <p>The assessment comprised systematic visual inspection of the in-water and quayside extent of the following proposed bridge developments: Site 1 (Forbes Street Bridge), Site 2 (Castle Forbes Street Bridge), Site 3 (Dodder/Gut Bridge), and Site 4 (East Link Bridge). The assessment sought to record riverbed topography, assess the potential of riverbed deposits to retain archaeological material and identify any additional features/structures of archaeological or historic significance that are present. In addition, targeted metal-detection was employed to help assess the riverbed and highlight any metallic concentrations present within these deposits.</p> <p>No material, deposits, or structures of archaeological or historical significance were encountered as part of the assessment of the riverbed impact locations.</p> |
| <p>17E0153, 17E0506 17D0026, 17R0077, 17R0045 17R0196 [2018:765]</p> | <p>Rex Bangerter, ADCO Ltd.</p> | <p>Dublin Port, Navigation Channel and Outer Fairway</p> | <p>The ABR project sees the progressive upgrading of the nineteenth- and twentieth-century quaysides of the Port's deepwater facility, Alexandra Basin, and the associated works that include capital dredging in the approach channel, which extends from Alexandra Basin to the Dublin Bay Buoy some 10km to the east, to increase the ruling depth from -7m CD to -10m CD. A series of archaeological licences have been granted to cover the broad spectrum of work involved. Licence 17E0153 was issued for underwater investigations conducted within the approach channel, with 17E506 covering the monitoring of the Capital Dredging operations.</p> <p>Capital Dredge Season 1 ran over a six-month period between October 2017 and March 2018. A series of underwater investigations were conducted in advance of the dredging and during intervals between dredge cycles. Some 201 artefacts were recovered during the monitoring work. A new shipwreck site was identified and preliminary investigation of the wreck site has been completed.</p> <p>The archaeological work undertaken as part of Capital Dredge Season 1 is summarised below:</p> <ol style="list-style-type: none"> 1. Dive operations at Site 1 were carried out between 10 and 24 July 2017. In order to re-establish the precise location observed in 2014 and ensure that any potential shipwreck remains protruding from the seabed were identified and located, a series of circular searches were carried out of the seabed surrounding the location of the shipwreck inventory site W01553. The underwater visual inspection was extensive and covered a seabed area of over 3000m². However, no structural components from a shipwreck were encountered as part of this non-disturbance assessment, although a galley brick (F01) and several pieces of metal slag were located at ITM: 727265E, 733249N (Lat/Long: 53° 20.035N, 6° 5.292W), close to the find-spot of a galley brick recovered in 2014. 2. Dive operations at Site 2 (off Poolbeg Lighthouse) were carried out between 3 and 7 July and on 25 July 2017. The ship's timbers identified in 2014 were re-located, along with a series of additional timbers. Seabed datum points were established (D1-D6) to facilitate recording (triangulation/offset measurements) and the positioning of two seabed test-trenches. 3. A total of six hundred and seventeen (617) dredge-runs were completed as part of the first capital dredge season. One |

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| | | | <p>hundred and thirty (130) dredge runs were completed during the first mini-dredge campaign, with one hundred and eighty-three (183) being completed as part of the second mini-dredge campaign. A further one hundred and twenty-six (126) dredge-runs were completed as part of Campaign No. 3, with one hundred and seventy-eight (178) being completed as part of Campaign No. 4 (4A/4B). The operations were subject to archaeological monitoring by ADCO. A total of two hundred and one (201) objects were recovered as part of the monitoring of the first season of capital dredging. The majority of these finds constitute ship-related timbers comprising both framing and planking components, totalling one hundred and twenty (120) frames and ten (10) plank sections. Many of the other items are also ship-related. These comprise ten (10) fired bricks (some of which are possible galley bricks), seven (8) anchor pieces, twelve (12) iron-fastening components, two (2) cannon balls, a fragment of copper sheathing, and the head piece from a wooden barrel. A series of thirty-eight (38) miscellaneous items were also recovered that included four (4) cast-iron deck bollards, two (2) iron barrel hoops, a brass deck light-fitting, an iron horse shoe, a cast-iron ballast weight, a kiln tile fragment, and various cast-iron items. Three (3) millstone fragments were also recovered, two (2) of which combine to form a single millstone. Eight (8) pieces of timber forming a wooden millstone axel were also retrieved.</p> <p>Monitoring established a probable source location for the millstone and a series of ship-related timbers. A 120m diameter (60m-radius) exclusion zone was imposed on this location, in accordance with the protocol put in place through the Archaeology Management Plan. Subsequent underwater assessment of this area confirmed the presence of <i>in situ</i> wreckage, situated 33.9m west of the centre-point of the exclusion zone, and a detailed underwater survey of the wreck site was carried out. The wreck is previously unknown and lies towards the top of the channel slope; it is orientated south-south-west to north-north-east, with the lowest point of the wreck lying at -7.19m Chart Datum (CD). The exposed section of wreckage measures 12.29m in length and c. 6m in width (max). A total of thirty-one (31) <i>in situ</i> flooring and/or first futtock timbers (framing timbers) are exposed along the port side of the vessel, with thirteen (13) located along the starboard side (FT01-FT31 and FT34-FT46). In agreement with National Monuments Service, it was possible to reduce the exclusion zone to a diameter of 50m (25m radius) around the wreck; centrepoint coordinate ITM 724273.21E, 734269.22N, or 53°20.642N Latitude 06°8.020W Longitude. The name 'Millstone Wreck' has been ascribed to the site.</p> <p>After the investigation underwater was completed, Storm Emma happened in March 2018. A multibeam survey conducted following the storm indicated that the wreck site lied buried beneath c. 1m of seabed re-deposition; reburial of the wreck being caused by storm-related slumping of sediments from the north side of the channel. Subsequent underwater inspection confirmed the burial depths of 1m+ across the site. The exclusion zone is now subject to regular underwater inspection to record sediments depths across the wreck site.</p> |
| <p>17E506 Ext. 17D077 Ext. 17R0196 Ext [2019:504]</p> | <p>Rex Bangerter, ADCO Ltd.</p> | <p>Dublin Port; Navigation Channel and Outer Fairway</p> | <p>Archaeological Monitoring of Capital Dredge Season 2 ran over a six-month period between October 2018 and March 2019, Mini-dredge Campaign Nos. 1-3. A total of three hundred and fifty-eight (358) dredge-runs were completed as part of this dredge season. One hundred and twenty-six (126) dredge runs were completed during the first mini-dredge campaign, with one hundred and eleven (111) being completed as part of the second mini-dredge campaign. A further one hundred and twenty-one (121) dredge-runs were completed as part of Mini-Dredge Campaign 3. Dredging operations were primarily focused on the Outer Fairway and Inner Channel, but also included dredging of Berth 53 within Dublin Port itself.</p> <p>Twenty-four (24) objects were recovered as part of the monitoring of the second season of capital dredging (Table 2). Sixteen (16) of these finds constitute ship-related timbers, comprising the following: nine (9) framing timbers, four (4) planking timbers, two (2) possible frames, and part of a ship's rudder assemblage (rudder-plank and pintle hinge). Additional finds</p> |

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| | | | <p>constituted both iron and wooden fastenings and other miscellaneous ship-related items. The finds assemblage represents disarticulated and isolated items on the seabed and does not relate to any additional, distinct/in situ, wreck sites within the dredged areas. The finds were removed from the dredger on completion of each campaign and are now in secure (wet) storage within the designated heritage zone in Dublin Port.</p> <p>A series of post-dredge archaeological assessment dives were carried out in July 2019. This work included: an underwater assessment of the location of the Millstone Wreck and wider exclusion zone; visual inspection of ten (10) marine geophysical targets identified from the post-dredge multibeam survey; and seabed instigation at the location of a vibrocore sample that contained five (5) fragments of timber (Vibrocore Sample W3A).</p> |
| <p>19D0063 19R0156 [2019:505]</p> | <p>Rex Bangerter, ADCO Ltd.</p> | <p>River Liffey, North Wall Quay/ Sir John Rogerson's Quay</p> | <p>Underwater Archaeological Impact Assessment (UAI/A) took place at the proposed location of a new pedestrian bridge to be positioned between the North Wall Quay (Du18-020564) and Sir John Rogerson's Quay (Du18-02021). The assessment was required as part of the planning process for the Blood Stoney Bridge project. The current project replaces development plans previously explored as part the North Lotts and Grand Canal Dock Strategic Development Planning Scheme; namely the Forbes Street Pedestrian Bridge.</p> <p>Blood Stoney Bridge is to measure 125m in length and comprise of a three-span steel bridge-deck extending between North Quay Wall (to the north) and Sir John Rogerson's Quay (to the south). The bridge is to be aligned with New Wapping Street and Blood Stoney Street. The bridge layout is symmetric (40m-40m north to south) and includes a 40m wide, opening, central-span of twin lifting bascule arrangement. The bridge will be supported by two (2) in-river piers structures. These are likely to require piled foundations and a temporary cofferdam during construction. The terminal ends of the bridge structure are to be supported by integral piers, placed in front (riverside) of the existing quay walls to minimise impacts to those structures.</p> |
| <p>19D0022 19R0052 [2019:508]</p> | <p>Rex Bangerter, ADCO Ltd.</p> | <p>River Liffey/ River Dodder</p> | <p>A comprehensive assessment of the River Liffey at the proposed bridge location was undertaken, encompassing a 124m north-south x 40m area. The survey extended a significant distance beyond the four (4) riverbed impact areas associated with the bridge project. The assessment recorded riverbed topography and provided a detailed account of the existing riverine environment. On-site work comprised the systematic non-disturbance inspection of the river channel, its attendant quays, and any associated quayside features encountered. In addition, targeted metal-detection was employed to help assess the riverbed and highlight any metallic concentrations present within those deposits. Aside from the quaysides, which were subject to detailed recording, no archaeological significant material, deposits, or structures were encountered as part the survey. The on-site work was carried out on 2 August 2019.</p> <p>Underwater Archaeological Impact Assessment (UAI/A) of two sections of the River Liffey was carried out, at a point close to the confluence of the River Dodder/River Liffey, upstream of the East Link Bridge. The assessment was undertaken as part of the planning process for the Dodder Public Transport Opening Bridge project, a project that replaces development plans previously explored as part of the Dublin Bridges project. The latter project comprised plans to construct four new bridges, crossing the River Liffey/River Dodder between Samuel Becket Bridge and the East Link Bridge. ADCO combined a detailed UAI/A with geotechnical testing of the riverbed as part of the feasibility study for that project, carried out in 2016, under DCHG licence numbers 16E0495, 16D0070, and 16R0175.</p> |
| | | | <p>The proposed Dodder Public Transport Opening Bridge lies within a historically rich landscape, highlighted by the</p> |

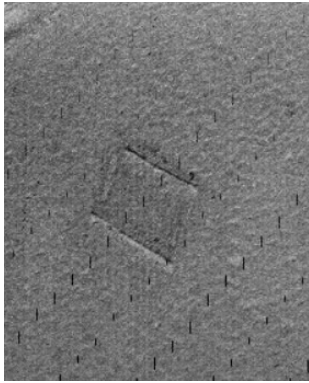
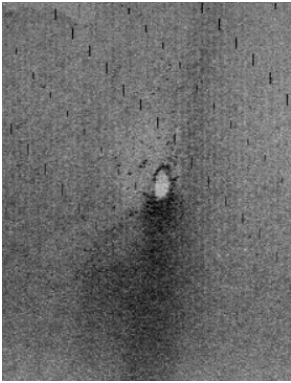
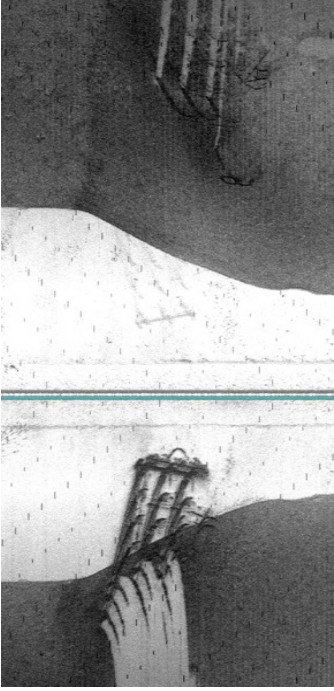
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| <p>17D0506 Ext. 17D0077 Ext. 17R0196 Ext. [2020:504]</p> | <p>Rex Bangerter, ADCO Ltd.</p> | <p>Dublin Port; Inner Channel Slopes and Outer Fairway</p> | <p>development of this section of the River Liffey for maritime use in the late eighteenth and early/mid-nineteenth century, Sir John Rogerson's Quay and the North Wall Quay forming tangible reminders of that maritime industrial past. Much of the riverbed/quayside areas impacted by the proposed bridge structure have been previously assessed by ADCO (2016). As such, only two riverbed areas required further assessment, where the new design footprint fell outside those riverbed areas previously subject to assessment. The centrepoint coordinates for these areas are as follows:</p> <ul style="list-style-type: none"> • Area A, ITM 717944E, 734247 • Area B, ITM 718011E, 734247N <p>The larger of the two areas (Area A) is roughly triangular in shape, measuring 111m x 101m x 80m, and extends across both the intertidal and subtidal zones on the south side of the river channel. The smaller area (Area B), measuring 18m x 7m, is also located on the south side of the channel, immediately upstream of the East Link Bridge.</p> <p>The assessment comprised systematic visual inspection of the intertidal and subtidal components at the two identified locations, undertaken on a Spring Low Water tide cycle. The assessment sought to record riverbed topography, assess the potential of riverbed deposits to retain archaeological material, and identify any additional features/structures of archaeological or historic significance that are present. In addition, targeted metal-detection was employed to help assess the riverbed and highlight any metallic concentrations present within these deposits. No additional archaeological significant material, deposits, or structures were encountered as part the survey.</p> <p>Capital Dredge Season 3 commenced on 21 October 2019 and was completed by 28 March 2020. The dredge season was divided into three (3) mini-dredge campaigns, focused upon three seabed locations. The first location included the Inner Channel slopes, to the east of the Bull walls, between Dublin Bay Buoys 7 and 5, and specifically between channel dredging setting-out points CH01 and CH14. The second location comprised dredging of the outer fairway of the approach/navigation channel, to the west of the Dublin Bay Buoy, within channel dredging setting-out points CH100 to CH107. The third area, dredged as part of mini-dredge campaign 3, included the north and south slopes of the channel from within the two breakwaters.</p> <p>A total of six hundred and eighty-five (685) dredge-runs were completed as part of Capital Dredge Season 3. One hundred and ninety dredge runs (190) as part of the first mini-dredge campaign, with one hundred and seven (107) as part of the second campaign. A further three hundred and eighty-eight (388) dredge-runs were completed as part of mini-dredge campaign 3.</p> <p>Thirty-six objects (36) were recovered from the archaeological monitoring process. Twenty-seven (27) of these finds constitute ship-related timbers, comprising the following: seventeen framing timbers (or fragments thereof), eight planking timbers, and two possible keel pieces. Additional finds constituted the following: four lengths of wrought-iron chain, three lengths of hemp-rope, one piece of worked stone, and the crown piece from a small anchor. In Addition, ADCO carried out a number of underwater assessments as part of the archaeological monitoring of Capital Dredge Season 3, with four assessments being completed at the close of Campaign 2 (in January 2020) and one prior to commencement of Capital Dredge Season 4 (in October 2020):</p> <ol style="list-style-type: none"> 1. Assessment of seabed at Exclusion Zone APW_1; extending across a 60m diameter area. 2. A post-dredge assessment of the Millstone Wreck; assessing the condition of the wreck site, seabed topography, and |


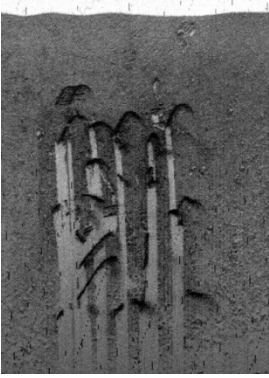
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| 20E0654 [2020:614] | Siobhán Deery, Courtney Deery Ltd. | Poolbeg, Pigeon House Road; Great South Wall | <p>depth of overburden covering the site.</p> <ol style="list-style-type: none"> 3. Post-dredge inspection along the footings of Poolbeg Lighthouse (Site 2, Poolbeg 4) to assess the condition of the series of ship's timbers lying adjacent to/protruding from the rock-armour that protects the foundations of the lighthouse. 4. Post-dredge inspection along the footings of the North Bull Lighthouse. 5. Post-dredge inspection of Seabed Location C, positioned on the south side of the channel, inside the two the breakwaters. <p>Archaeological monitoring was carried out of groundworks at the Poolbeg Tank Farm site drainage tie-in to the Rathmines Sewer. A section of the original revetment and inner and outer walls of the South Sea Wall were removed under archaeological supervision to accommodate a pipeline. Following the insertion of the pipeline, the revetment and walls were reinstated.</p> <p>Prior to the commencement of groundworks the on-site vegetation was cleaned off, five rows of stones were numbered and fencing was erected. A mini-digger on rubber tracks and fitted with a jackhammer was used to break concrete along the line of the pipeline. Concrete grouting and concrete from the surface of some slabs was also removed by hand using bolsters and deeper grout was cut with a consaw. Concrete over the sewer was broken out to depth of approximately 0.4m. The line of the pipeline was cut and the remaining depth was broken out by hand with a jackhammer to reveal yellow sand beneath.</p> <p>The quay wall is described as a double stone wall varying from 11m to 14m in width with the space in between filled with sand and built from large granite blocks bonded by cement and fastened with iron cramps (De Courcy 1996). The surface of the pier at the point of this development was 13.17m wide. It was built in two sections with three parallel walls: an outer sea wall with a paved surface, an inner quay wall that is 7.53m in width and an inner revetment with a concrete surface and a containing wall, 5.64m in width.</p> <p>A single line of granite blocks on the south side of the Rathmines sewer formed the outer wall. It comprised alternating large and small blocks with a stepped layout on the north side. The large blocks measured 0.8m x 0.9m x 0.9m and the small blocks measured 0.5m x 0.6m x 0.9m. The paving was supported at either end by large granite block walls, 0.65m in width, and by a ballast of hydraulic fill consisting of brown fine to coarse sandy gravel with numerous rounded and slightly angled cobbles of varying size.</p> <p>The quay wall comprised long granite blocks. The blocks were up to 2.5m long, were on average 0.3m wide and 0.45m deep. They were laid from north to south. Beneath the surface layer of slabs, the southern side of the wall was constructed of slabs of the same dimensions and laid from east to west. The core of the wall was filled with sand. The surface stones were lifted from south to north using slings and stored adjacent to the work area.</p> <p>The inner revetment wall was topped with shaped granite stone that was laid in such a way as to produce a crenelated effect, alternatively 0.92m and 0.61m in width. The decorated stone was supported by a large block wall, only slightly visible. The iron cramps mentioned by De Courcy (1996) were not encountered within the line of the pipeline.</p> <p>A number of modifications of the original design were required during excavation work and an amended method statement was submitted to the National Monuments Service and to Dublin City Council. It was originally proposed to core drill the outer</p> |

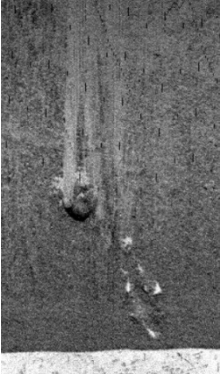
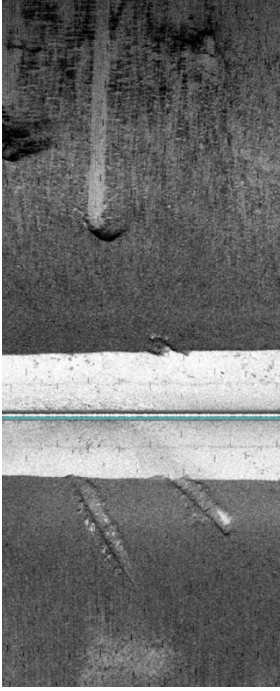
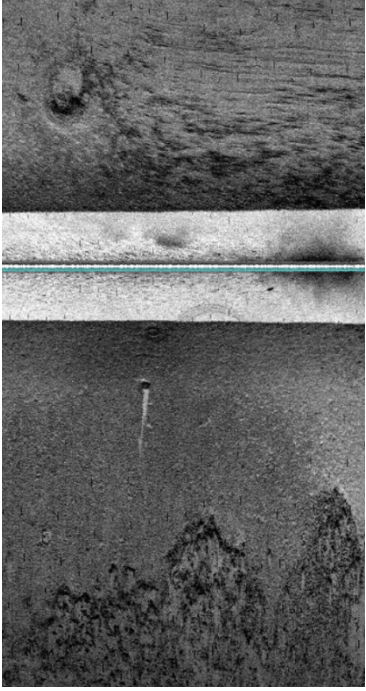
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| | | | <p>sea wall. This was changed to the insertion of a cut and cover slot trench because of the difficulty of establishing an anchor point for the core drill. The top of the Rathmines sewer line, which runs close to and parallel to the revetment wall of the pier, was less than one meter below the existing concrete surface. As a result, the depth of the open trench was reduced from 1.3m to 1m.</p> <p>Finally, the width of the trench in the paved section of the pier was also reduced, during excavation, from a proposed 0.75m to 0.65m. This resulted in only two lines of the granite paving slabs having to be lifted to excavate the open trench. The pier was reinstated with the paving slabs in their original position and with a new concrete surface over the Rathmines sewer line and the inner revetment section of the pier.</p> <p>No other features of archaeological significance were observed during the monitoring works.</p> |
| <p>17D0506 Ext. 17D0077 Ext. 17R0196 Ext. [2021:425]</p> | <p>Rex Bangerter, ADCO Ltd.</p> | <p>Dublin Port; Inner Channel</p> | <p>Capital Dredge Season 4 commenced on 3 October 2019, operating over a six (6) month period, and was completed on by 31 March 2021. The season was sub-divided into six (6) mini-dredge campaigns. A total of one thousand, one-hundred and twenty-six (1126) dredge-runs were carried out as part of this final dredge season: one hundred and ninety-five (195) dredge runs being completed for Campaign 1; two-hundred and nine (209) dredge-runs for Campaign 2; two-hundred and twenty-nine (229) dredge-runs for Campaign 3; two-hundred and thirty-nine (239) dredge-runs for Campaign 4; one hundred and sixty-eight (169) for Campaign 5; and eighty-five (85) for Campaign 6.</p> <p>For the most part, dredging focused along the innermost channel area, located within the port's breakwater structures (North/South Bull Walls). Mini-dredge Campaigns 1-5 dredged exclusively within the Bull Walls, while Mini-dredge Campaign 6 concentrated its operations along the channel slopes outside the Bull Walls, predominantly removing redeposited (storm related) sediment.</p> <p>Forty-nine (49) objects were recovered from the archaeological monitoring process. Thirty-two (32) of these constitute ship-related timbers, comprising the following: fourteen (14) planking timbers, thirteen (13) framing timbers, three (3) timber fragments, one (1) timber dowel, one (1) deck timber, and one (1) miscellaneous timber. Additional finds included: six (6) lengths of hemp rope, three (3) iron fastenings, two (2) wrought-iron chains, one (1) piece of wrought-iron plate, one (1) anchor component (crown), one (1) piece of shoe leather, one (1) plough-claw, and one (1) fragment of granite masonry.</p> <p>A series of pre/post-dredge archaeological dives were completed as part of Capital Dredge Season 4, carried out in October 2020 and May 2021. This included items 1-5 below:</p> <ol style="list-style-type: none"> 1. Inspection of marine geophysical targets identified as part of pre-dredge multibeam survey of the upriver area of the Navigation Channel, to the west of Buoy Number 2. Underwater assessment (yearly inspection) of the Millstone Wreck to assess the condition of the wrecksite, seabed topography, and depth of overburden covering the site. 3. Extended survey of the seabed surrounding Location C. 4. Underwater inspection at Location D, an area of seabed positioned at the top of the channel slope, on the north side of the outer fairway, at a point 300m west of Buoy Number 1. 5. Removal of a series of disarticulated ships timbers that are lying on the seabed adjacent to the rock-armor for Poolbeg |



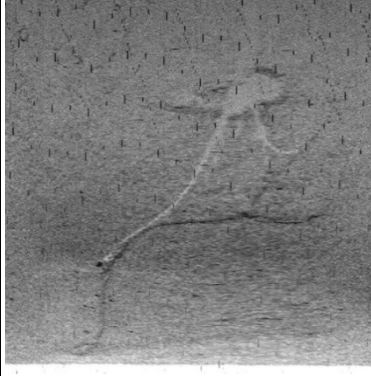
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|-------------------------------|----------------------|----------------------------|---|
| 21E0796 [2022:294] | Paul Duffy, IAC Ltd. | Poolbeg Generating Station | <p>Lighthouse (Site 2/Poolbeg 4).</p> <p>The archaeological diving for Items 1-4 were carried out under licence numbers 17D0077 and 17R0196 (2020-2021 ext.), while underwater work at Site 2/Poolbeg 4 (Item 5) was carried out under licence numbers 21E0187, 21R0059, and 21D0044.</p> <p>Archaeological monitoring of trial pits was undertaken within the existing Poolbeg Generating Station. A total of 15 test pits were excavated and monitored during works at two sites in the western and eastern areas of the development. A concrete poured slab was encountered across all the test pits to a depth of 0.12m. Below the concrete slab an orange brown sandy silt was noted to a depth of 0.55m but varies slightly from pit to pit. A grey silty fine-grained sand containing very little gravel and stones and the occasional fragments of bitumen and marine shell was recorded to a maximum depth of 1.8m and below this was a similar fill containing more gravel and stone to a depth of 2.9m. No archaeological features or finds of significance were noted during the monitoring of ground disturbance at this site.</p> |
| 22E0007 22D0001 22R0003 | Rex Bangerter, ADCO | Dublin Port; Inner Channel | <p>Archaeological Monitoring of advanced Site Investigation works for the MP2 and 3FM projects.</p> <ul style="list-style-type: none"> MP2 Project comprised twenty (20) geotechnical exploratory boreholes/ 3FM Project comprised thirty-two (32) geotechnical exploratory boreholes. <p>The boreholes were drilled using cable percussive/rotary core methods. This work was undertaken to determine the various stratum types that are present across the development footprint, thus informing appropriate construction design. The marine boreholes ranged between 100mm-200mm in diameter and extended to a maximum depth of c. 35m below existing bed-levels. Samples were retrieved, at regular vertical intervals (typically 1.5m to 2.5m) from the upper strata, and were retained for sediment identification/classification and laboratory testing.</p> |
| 22E0401 22D0059 22R0191 | Rex Bangerter, ADCO | Dublin Port; Inner Channel | <p>The monitoring work did not identify any distinct layers of archaeological potential.</p> <p>Archaeological Monitoring of Capital Dredging operations for MP2 within the following port areas:</p> <ol style="list-style-type: none"> Dredging of Berth 52 to a depth of -3m CD, west side of Northern Widening Area (NWA). Dredging of Berth 53 and associated channel widening (NWA) to a depth of -10.0m CD. Dredging of the Southern Widening Area (SWA) to a depth of -10m CD. <p>The dredging was carried out using a backhoe dredger and TSHD.</p> <p>No <i>in situ</i> features of archaeological significance were encountered as part of the monitoring process. Seven (7) portable finds of archaeological interest were recovered and have been retained (Find Numbers: 220402:001-007); six (6) of these finds came from the northern side of the channel (Berth 53/Northern Widening Area). The majority of the modern material encountered also came from the Berth 53/ Northern Widening Area; a total one-hundred and thirteen (113) items recovered from the NWA opposed to twenty-five (25) from the SWA. All items recovered were of twentieth-century date or later.</p> |

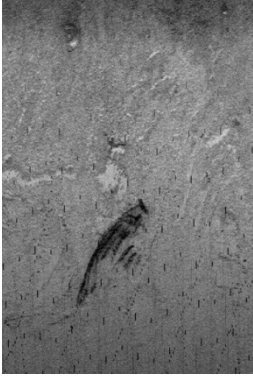

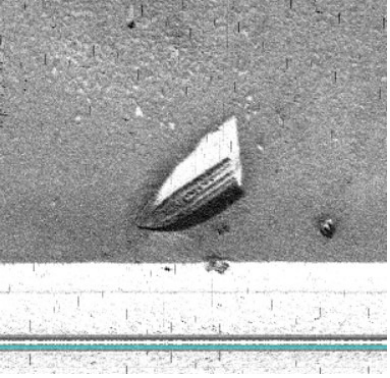
Appendix 4: List of side-scan sonar targets subject to underwater inspection as part of the assessment.

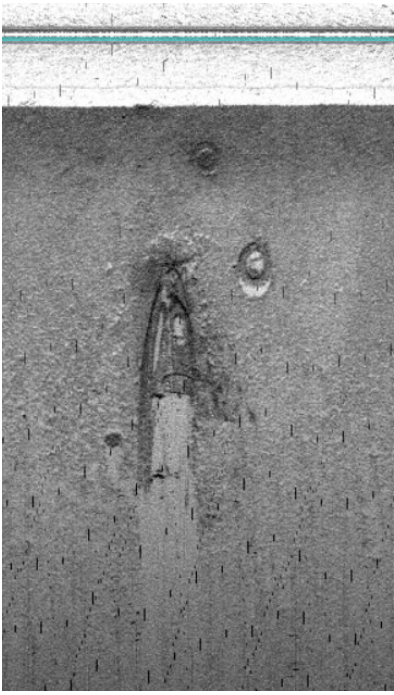


| Target No. | Coordinates [ITM] | Interpretation [ADCO] | Correlation [Hydromaster] | Side-scan Sonar Image | Underwater Inspection [ADCO] |
|------------|---------------------|---|---|---|---|
| SS_01 | 718071E, 734268N | Gridded object, measuring 2.3m by 3.1m. | H51 (block). |  | Large, rectangular, window frame (aluminium fabric); pane covered by silt; frame edges upstanding 20mm from riverbed. |
| SS_02 | 718093E, 734276N | Circular object, 700mm in diameter. | No direct correlation, positioned 9m south of target H42 (boulder). |  | Circular depression (700mmØ) in riverbed present; likely from spud-leg of jack-up barge that was carrying out SI work in the area. |
| SS_03 | 718077E, 734296N | Openwork structural feature comprising three (3) verticals secured by horizontal elements; target measures 3.6m length, with the vertical elements placed at 1.5m separations. Presumably a detail of the East Link Bridge structure. | No direct correlation, but located beside large magnetic anomaly. |  | Timber framework, southwest corner of Dolphin structure on downstream side of Tom Clarke (East-link) Bridge; prominent scour on west side of pile, measuring 1.54m depth and 1.5m in diameter, with 45° angle of slope. |

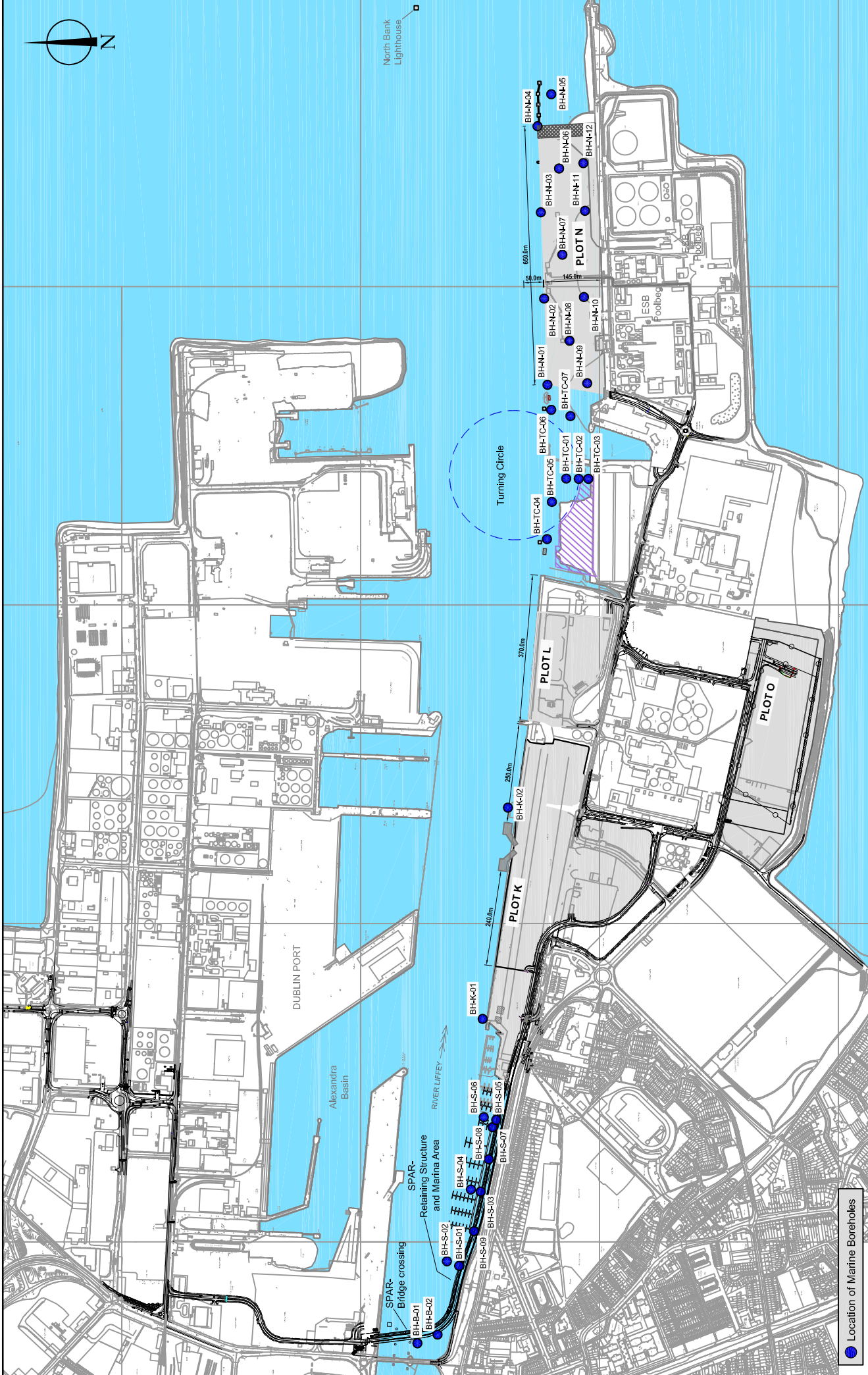
| Target No. | Coordinates [ITM] | Interpretation [ADCO] | Correlation [Hydromaster] | Side-scan Sonar Image | Underwater Inspection [ADCO] |
|------------|---------------------|---|---------------------------|--|--|
| SS_04 | 720486E, 733997N | Tyre 2.8m in diameter, half buried with linear feature extending from it; probably a mooring. Recorded several times. | H331 (debris). |  | Target located close to mooring for Buoy No. 16 (mooring buried, but large steel ring and mooring bridle visible). Image shows probable tractor tyre, re-sued as a mooring. Feature likely buried in the deep deposit (c. 600mm) of silt that comprises the upper stratum of riverbed within this area. Probing carried out across this area, but object not encountered. |
| SS_05 | 720835E, 733928N | Cluster of features indicating structural feature extending over area measuring 9m by 10m. | H388 (debris). |  | Target relates to modern construction debris associated with the Oil Jetty. Five (5) wide-flange steel beams (H-beams), measuring 300m length and 20mm in thickness are located on the south side of the dolphin structure. These protrude 200mm from the riverbed, rising at a c. 50° angle. A short distance (4-5m) upstream (west) an entrapment area is formed by a partially buried tree-branch (upstanding between 400mm and 500mm) into which lengths of steel-cable and polypropylene rope is entangled. An area of compact silty-sand (200mm penetration) is located on upstream side of the dolphin. |

| Target No. | Coordinates [ITM] | Interpretation [ADCO] | Correlation [Hydromaster] | Side-scan Sonar Image | Underwater Inspection [ADCO] |
|------------|---------------------|---|---------------------------|---|--|
| SS_06 | 720169E, 733955N | Tyre 1.7m diameter, next to some debris. | H294 (block). |  | No object or debris encountered for this target location. Seabed composed of silty-sand with a penetration depth of 200mm. Target represents either a natural features of mobile item/s. |
| SS_07 | 720184E, 733955N | Possible tyre, 1.9m in diameter, located 5m from two (2) linear debris features, each measuring 5.3m in length. | H296 (debris). |  | Large, circular, depression in seabed measuring 120mØ and 1m in depth; likely from spud-leg of jack-up barge that was carrying out SI work in the area. A large mooring-ring protrudes 100mm from the seabed at a location 3m to the southwest of the target. Ring measures 300mm in visible length and is likely to have a diameter of 450mm-500mm. |
| SS_08 | 720243E, 733867N | Target, probable debris, measuring 800mm in length; located 9m from probable tyre (1.4m in diameter). | H302 (boulder). |  | Length of greenheart timber, square in profile (300mm x 300mm) that protrudes at a 45° angle from the seabed. Exposed length measures 900mm in length. Timber has a machine-cut scarf joint at its terminus. A hexagonal-bolt fastening is located half-way along its exposed upper face. Timber is either from a jetty/wharf structure (vertical pile or cross-member) or is part of a fender from a quay-wall façade. Item is of twentieth century date. |

| Target No. | Coordinates [ITM] | Interpretation [ADCO] | Correlation [Hydromaster] | Side-scan Sonar Image | Underwater Inspection [ADCO] |
|------------|---------------------|---|--|---|--|
| SS_09 | 720306E, 733833N | Structural feature, located at outfall tanks along GSW, with linear element at base, 5m in length with associated debris. | Not highlighted in Hydromaster survey. |  | Large tree-trunk (flotsam) removed from navigation channel, now moored alongside quay (at pier head) within Pigeon House Harbour. |
| SS_10 | 718635E, 734175N | Short linear feature, 400mm in length. | H141 (boulder). |  | No object encountered at target location, likely to be mobile item (tree-debris) that is no longer present. |
| SS_11 | 718629E, 734153N | Mooring with line attached; ghost feature showing shadow of moored vessel above. | H233 (chain or rope). |  | Boat mooring. Weight remains buried with two (2) lengths of anchor-chain running along riverbed. The chains are fastened to corresponding mooring ropes that lead to surface. Seabed composed of a silty-sand with a penetration depth of 400mm. |

| Target No. | Coordinates [ITM] | Interpretation [ADCO] | Correlation [Hydromaster] | Side-scan Sonar Image | Underwater Inspection [ADCO] |
|------------|---------------------|--|---|---|--|
| SS_12 | 718366E, 734150N | Possible vessel, part buried, measuring 6.2m in length and 1.63m width; defined bow and stern sections. Tyre or mooring located 8.5m away from vessel. | No direct correlation, positioned 5m southwest of H143 (mooring). |  | No object encountered at target location, indicating image is of portable object (large tree-branch similar). Two (2), partially buried, iron wagon-wheels (700mmØ) from a train carriage, reused as mooring weights, are located 8.2m from the target location. Riser-chain is attached to middle part of each mooring, using 18mmØ chain. Seabed composed of a silty-sand with a penetration depth of 300mm. |
| SS_13 | 718387E, 734204N | Possible vessel, largely buried, but with potential gunwales and a central feature indicated. Target measures 7.8m length by 2.7m with. | H122 (mooring). |  | Tree debris, measuring c. 3.9m in length, with four (4) arms extending from the main branch. Seabed composed of a silty-sand with a penetration depth of 250mm. |
| SS_14 | 718601E, 734129N | Vessel, partly buried and lying to one side. Target measures 5m length, standing 1.8m off seabed. | H223 (boat wreck) |  | Small boat (fiberglass) lying on riverbed, orientated southwest (bow) to northeast (stern); measuring 5m length by 2m width. |

| Target No. | Coordinates [ITM] | Interpretation [ADCO] | Correlation [Hydromaster] | Side-scan Sonar Image | Underwater Inspection [ADCO] |
|------------|---------------------|--|---|--|--|
| SS_15 | 718416E, 734145N | Possible vessel, defined feature measuring 2.2m length by 1.6m width with elements standing 3.3m off seabed, next to some tyres. | H148 (tyre). |  | Boat (Shetland Motorboat), upstanding from riverbed; vessel measures 6m length by 2m width. Boat is lying on its keel, listing to starboard (c. 20° angle). Outboard engine still attached to stern-board. Two (2) car-tyres (boat fenders) located a short distance from the bow section, to the west and south. Vessel partially visible protruding from water at Low Water [see Plate 12]. |
| SS_16 | 721226E, 734058N | Series of three (3) gridded features measuring 2.2m in width by 4m length. Possibly associated with anchoring for the Tern colony. | Not highlighted in Hydromaster survey, but located 6m east of magnetic anomaly. |  | No object encountered at this location. However, riverbed is disturbed; irregular formation (clumps and ridges) present. Seabed is composed of deep deposit of silty-clay (>500mm penetration). |
| SS_17 | 721406E, 734056N | Linear feature, possible anchor clump. | Not highlighted in Hydromaster survey; no other anomaly close by. |  | Mooring line and steel-ring (attached to buried mooring block) rising to Buoy No. 14. Seabed is composed of deep deposit of silty-clay (>500mm penetration). |



● Location of Marine Boreholes

Notes
 Sources: 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.



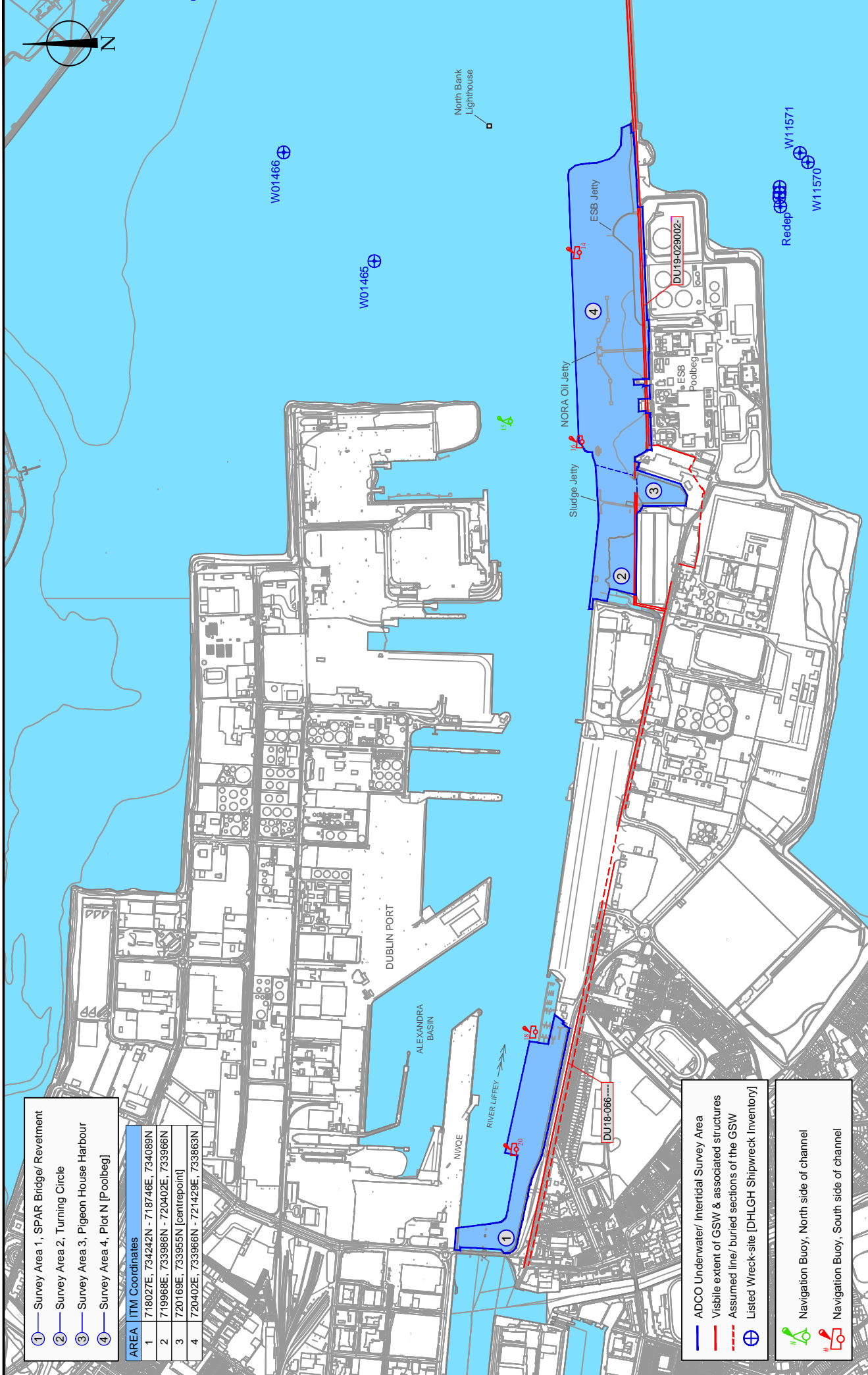
A4
Job/Exc No.
 23D0037, 23R0148
Date
 06.07.23

Compiled by
 R.Bangster
Scale
 1:12,500

CAD reference
 3FM_LUAIA
Drawing No.
 Figure 4

Client
 RPS/ Dublin Port Company (DPC)
Project
 Dublin Port, 3FM Project

Title
 Figure 4- OS Background Mapping with 3FM project extent and location of Marine SI Works (Boreholes) superimposed.



| | |
|---|---------------------------------------|
| ① | Survey Area 1, SPAR Bridge/ Revetment |
| ② | Survey Area 2, Turning Circle |
| ③ | Survey Area 3, Pigeon House Harbour |
| ④ | Survey Area 4, Plot N [Poolbeg] |

| AREA | ITM Coordinates |
|------|-------------------------------------|
| 1 | 718027E, 734242N - 718746E, 734089N |
| 2 | 719968E, 733966N - 720402E, 733966N |
| 3 | 720169E, 733955N [centrepoint] |
| 4 | 720402E, 733966N - 721429E, 733863N |

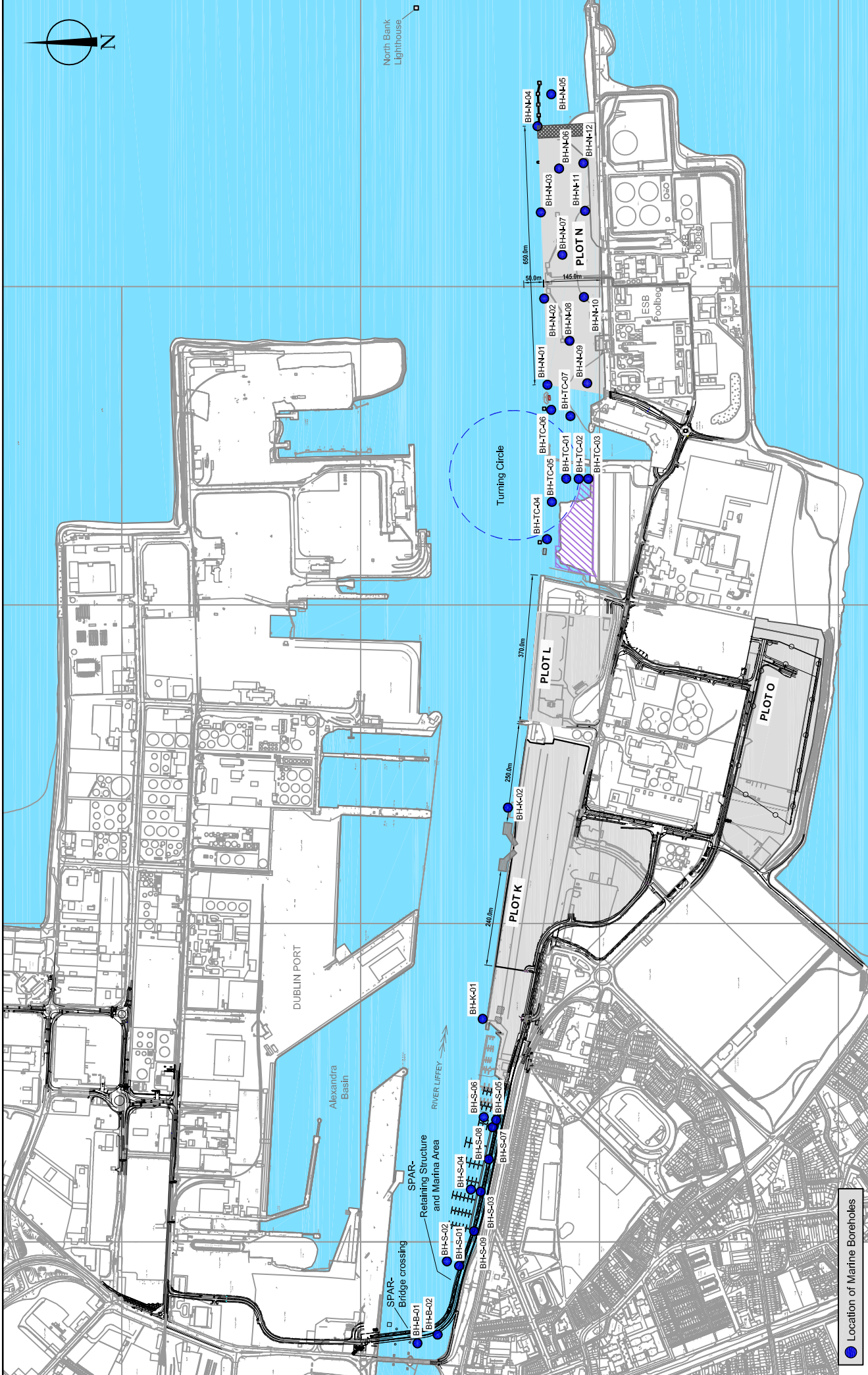
- ADCO Underwater/ Intertidal Survey Area
- Visible extent of GSW & associated structures
- - - Assumed line/ buried sections of the GSW
- # Listed Wreck-site [DHLGH Shipwreck Inventory]

- # Navigation Buoy, North side of channel
- # Navigation Buoy, South side of channel

Notes
 Source: OS Background Mapping with survey data superimposed.
 - ADCO U/w Survey undertaken 03.04.22-08.04.22
 - GSW extents based on ADCO walkover inspection.

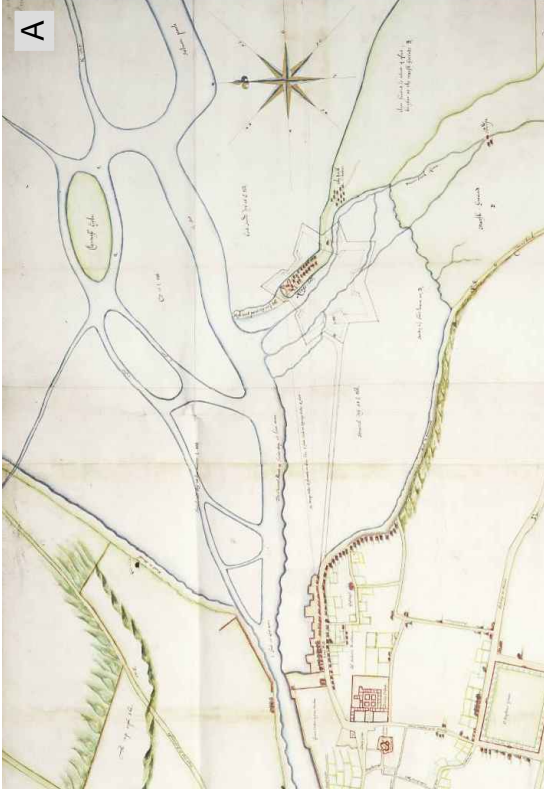


| | |
|---|---|
| Title Figure 2 - Extent of ADCO Underwater/Intertidal Survey, Areas 1-4, Dublin Port 3FM project. [see Figure 15 for distribution of Cultural Heritage Assets] | Client RPS/ Dublin Port Company (DPC) |
| | Project Dublin Port, 3FM Project |
| CAD reference 3FM_UAIA | Drawing No. Figure 2 |
| Completed by R. Bangenter | Scale 1:15,000 |
| Job/Exc. No. 23D0037, 23R0148 | Date 06.07.23 |
| A4 | |

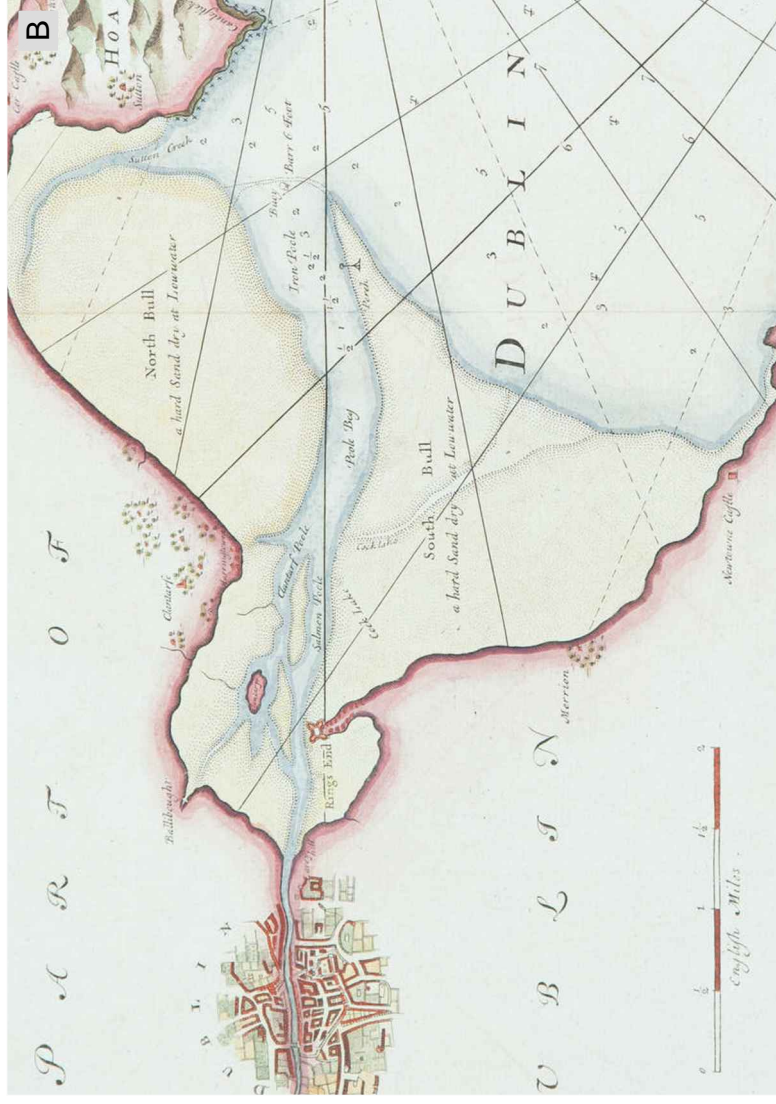
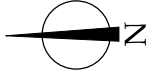


| | | | | | | |
|---|--|--|----------------------------------|--|---|---|
| Notes Sources: Figure adapted from project drawing supplied by RPS (3FM-Marine SI Layout Rev-P02). Reservation for Renewable Energy Infrastructure not included in the 3FM Project Application. | A4 | Job/Exc No. 23D0037, 23R0148 | Compiled by R.Bangster | CAD reference 3FM_LUAIA | Client RPS/ Dublin Port Company (DPC) | Title Figure 4- OS Background Mapping with 3FM project extent and location of Marine SI Works (Boreholes) superimposed. |
| | Date 06.07.23 [rev.27.06.24] | Scale 1:12,500 | Drawing No. Figure 4 | Project Dublin Port, 3FM Project | | |





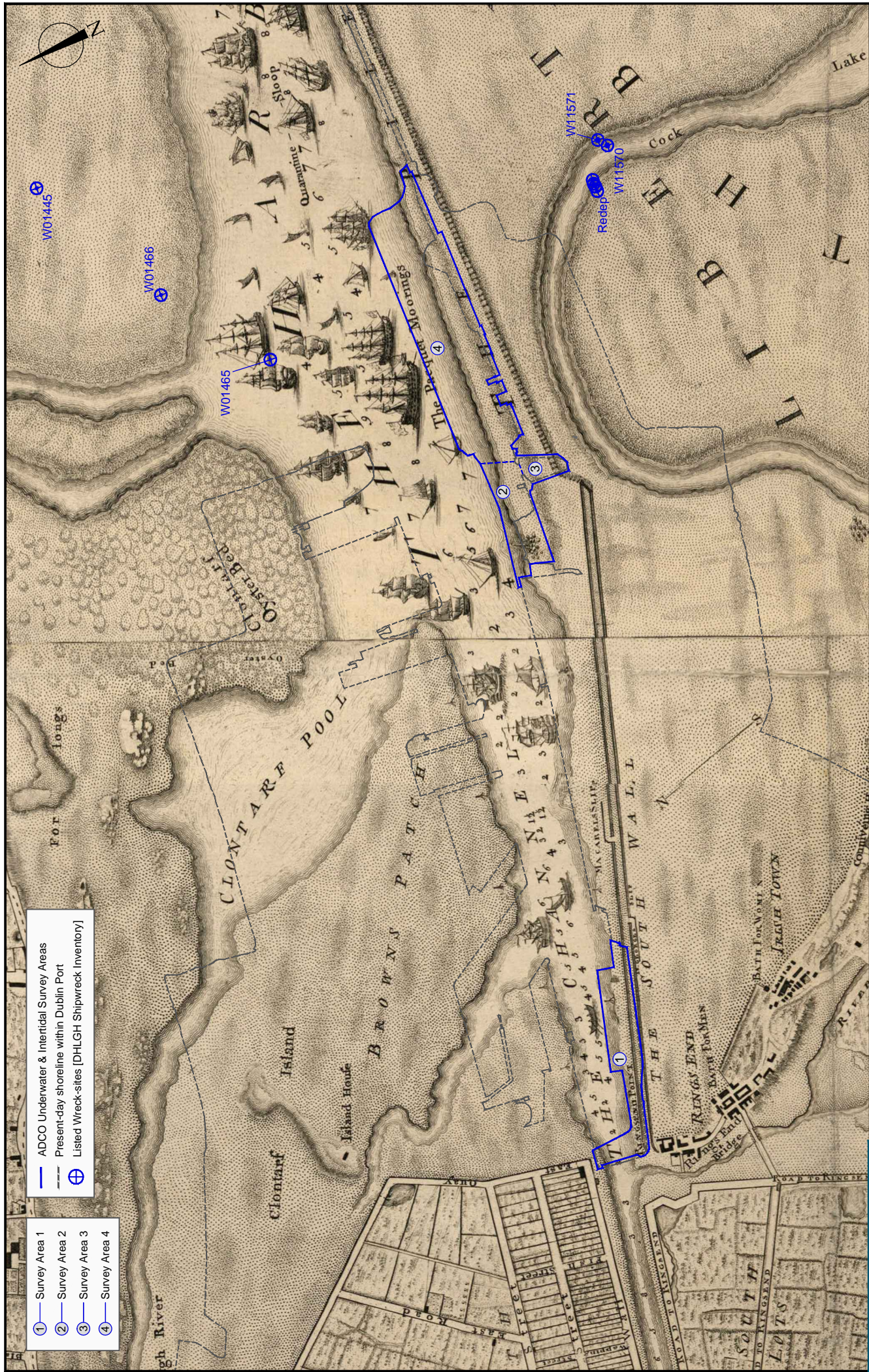
Detail from Bernard De Gomme's Map of 1673, 'City and Suburbs of Dublin' showing the river mouth area [National Maritime Museum Greenwich].



Extract from Captain Grenville Collin's of 1693, 'A Map of Dublin Bay, from Portmarnock to Dunleary' [S.J. Clarke Collection].

| | | | | | | |
|--|----|---|-------------------------------------|--|---|---|
| Notes Source: A- National Maritime Museum, Greenwich, UK. B- S.J. Clarke Collection [Adams.ie] | A4 | Job/Exc No. 23D0037, 23R0148 Date 04.07.23 | Completed by R. Bangerter | CAD reference 3FM_UAIA Drawing No. Figure 5 | Client RPS/ Dublin Port Company (DPC) Project Dublin Port, 3FM Project | Title Figure 5- Extracts from seventeenth century mapping of Dublin Harbour and the wider bay area. |
|--|----|---|-------------------------------------|--|---|---|



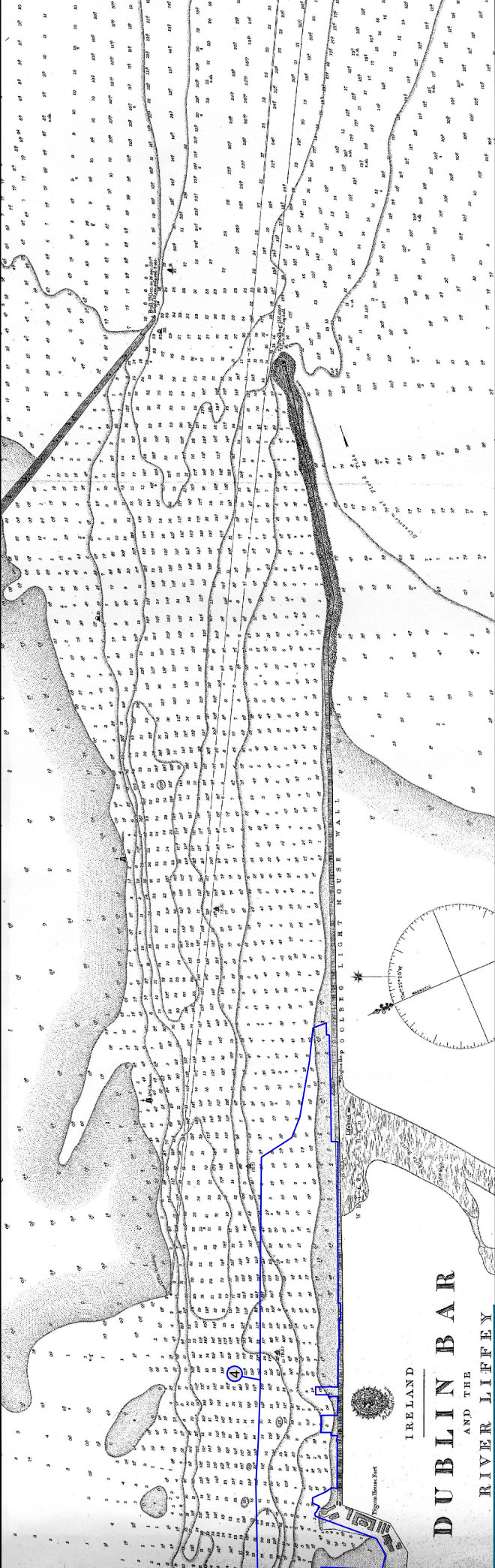
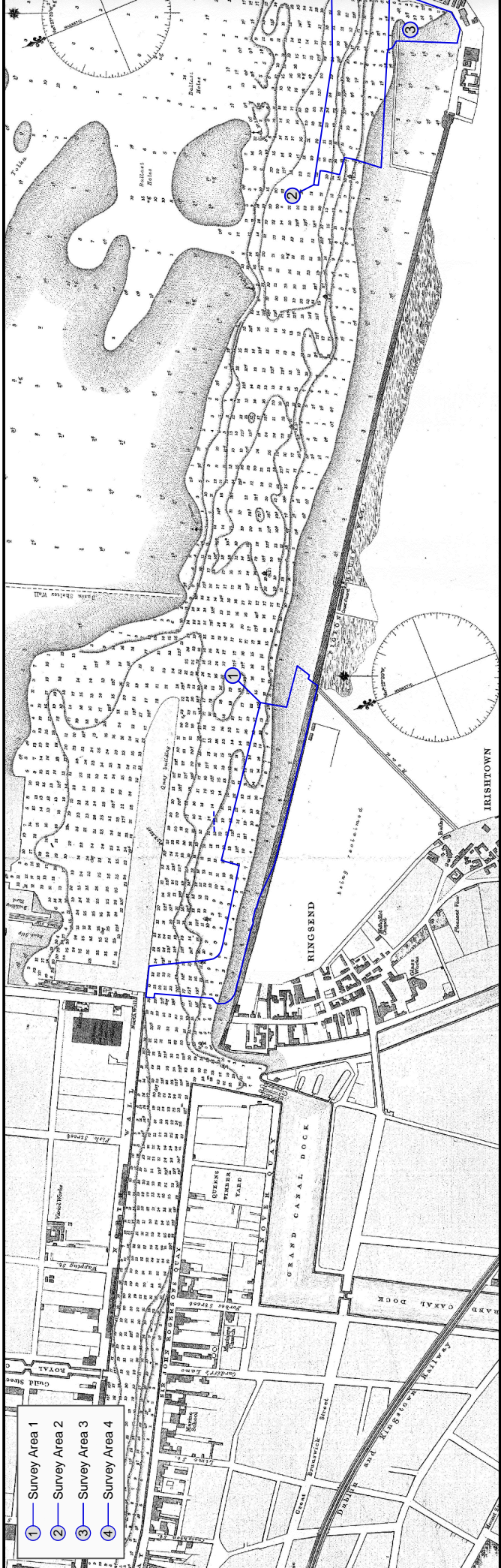


① Survey Area 1
 ② Survey Area 2
 ③ Survey Area 3
 ④ Survey Area 4

--- ADCCO Underwater & Intertidal Survey Areas
 - - - Present-day shoreline within Dublin Port
 ⊕ Listed Wreck-sites [DHLGH Shipwreck Inventory]

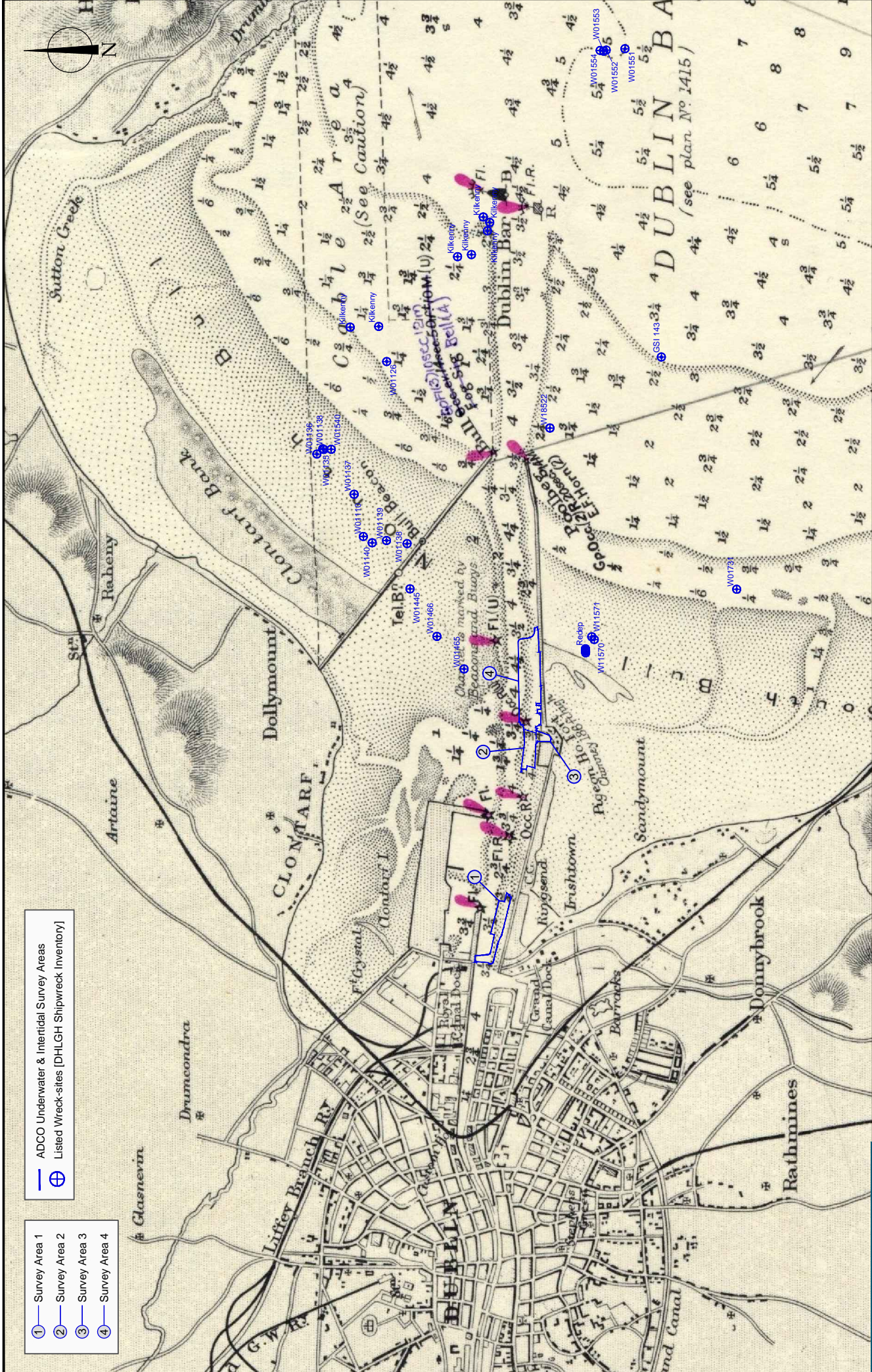
| | | | | | | |
|--|-------------------------|---|-------------------------------------|--|---|--|
| Notes Source: bilioetodigitalhispanica.bne.es [locational details for shipwreck sites taken from DHLGH Shipwreck Inventory] | A4 | Job/Exc. No. 23D0037, 23R0148 | Completed by R. Bangarter | CAD reference 3FM_UAIA | Client RPS/ Dublin Port Company (DPC) | Title Figure 6- Detail from John Roque's Map of 1757, 'A Survey of the City Harbour and Environs of Dublin', with approximate location of ADCCO Survey Areas 1-4 superimposed. |
| | Date 03.07.23 | Scale 1:15,000 | Drawing No. Figure 6 | Project Dublin Port, 3FM Project | | |





| | | | | | | | | | | | |
|---|--|---|--|---|--|---|--|--|--|---|--|
| <p>Notes Source: UKHO [Surveyed by Staff Commander C.H.C. Langdon, 1880, Chart No. 1447].</p> | | <p>Job/Exc No. 23D0037, 23R0148</p> | | <p>Complied by R. Bangerter</p> | | <p>CAD reference 3FM_UAIA</p> | | <p>Client RPS/ Dublin Port Company (DPC)</p> | | <p>Title Figure 7- Detail from Commander Langdon's Chart of 1880, Dublin Bar & The River Liffey to Carlisle Bridge, with approximate location of ADCC Survey Areas superimposed.</p> | |
| <p>A4</p> | | <p>Date 03.07.23</p> | | <p>Scale 1:12,000</p> | | <p>Drawing No. Figure 7</p> | | <p>Project Dublin Port, 3FM Project</p> | | | |





1 Survey Area 1
2 Survey Area 2
3 Survey Area 3
4 Survey Area 4

ADCC Underwater & Intertidal Survey Areas
W Listed Wreck-sites [DHGLGH Shipwreck Inventory]

| | | | |
|----------------------|--|--|--|
| Notes | A4 Job/Exc. No. 23D0037, 23R0148 Date 03.07.23 | | |
| | Notes: Admiralty Chart 1468, Wicklow to Skerries Islands, Dublin Bay, 1883. (locational details for shipwreck sites taken from the DHGLGH Shipwreck Inventory) | | |
| Client | RPS/ Dublin Port Company (DPC) | | Title Figure 8 - Extract from Admiralty Chart No. 1468 (1883) with 1965 additions and approximate location of ADCC Survey Areas superimposed. |
| | Project Dublin Port, 3FM Project | | |
| CAD reference | 3FM_UAIA | | Drawing No. Figure 8 |
| | Completed by R. Bangertner | | |
| Scale | 1:50,000 | | Project Dublin Port, 3FM Project |
| | Date 03.07.23 | | |



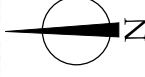


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CENTRE COORDINATES:
ITM 718535.734295

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6inch BW ED01
MAP SHEETS: DN018
DN019

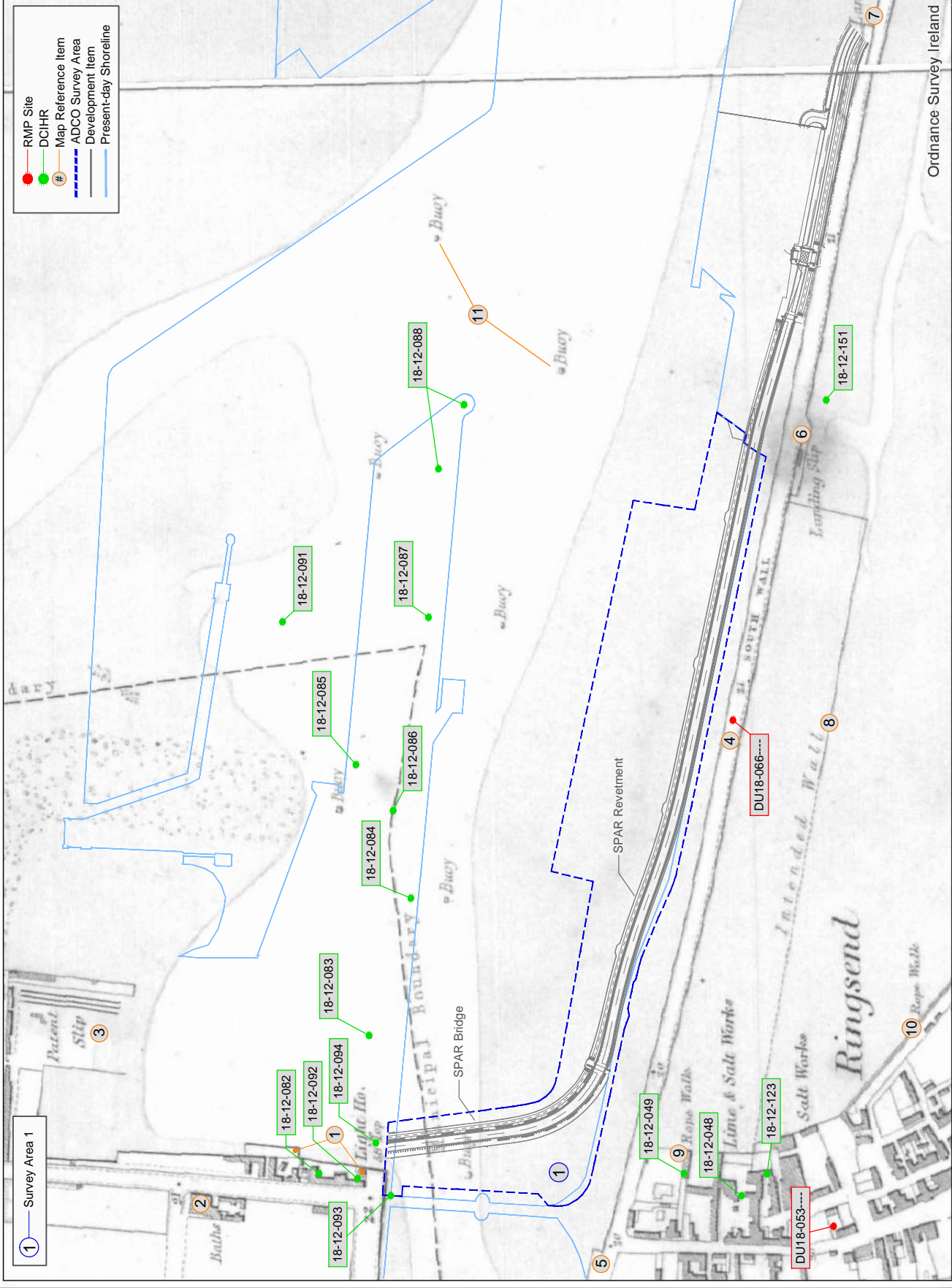


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0m 50m 100m

- RMP Site
- DCHHR
- # Map Reference Item
- # ADCO Survey Area
- # Development Item
- Present-day Shoreline



| | | | | | | | |
|--|-------------------------|------------------------|--|--|-----------------------------------|---|---|
| Notes Map Source: OS Historic Map Archive - Tailte Éireann. [RMP locations - NIMS map viewer] [DCHHR locations - HeritageMaps.ie map viewer] | | A4 | Job/Exc No. 23D0037, 23R0148 | Compiled by R. Bangerter | CAD reference 3FM_LUAIA | Client RPS/ Dublin Port Company (DPC) | Title Figure 9 - OS First Edition Map (1837) with ADCO Survey Area 1, surrounding Cultural Heritage Assets, selected Cartographic Features, and present-day shoreline superimposed. |
| | Date 30.06.23 | Scale 1:2000 | Drawing No. Figure 9 | Project Dublin Port, 3FM Project | | | |



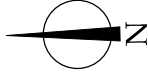


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MAP SERIES: 6inch BW ED01
MAP SHEETS: DN019



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0m 50m 100m

- RMP Site
- DCIHR
- # Map Reference Item
- # ADCO Survey Area
- # Development Item
- Present-day Shoreline

- 2 Survey Area 2
- 3 Survey Area 3
- 4 Survey Area 4



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



A4

Job/Exc No.
23D0037, 23R0148
Date
30.06.23

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R. Bangert
Scale
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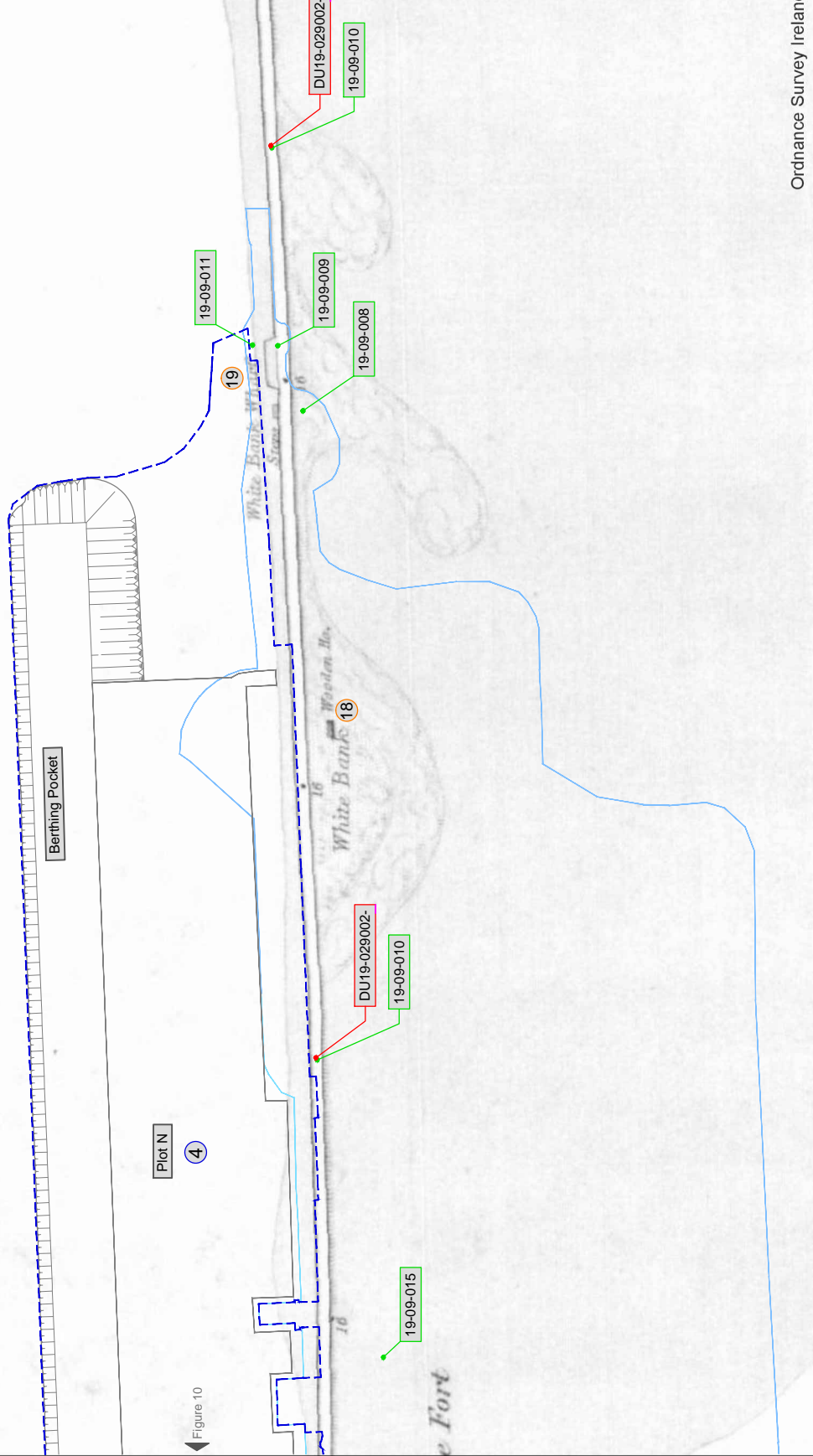
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Drawing No.
Figure 10

Client
RPS/ Dublin Port Company (DPC)
Project
Dublin Port, 3FM Project

Title
Figure 10- OS First Edition Map (1837) with ADCO Survey Areas 2-4, surrounding Cultural Heritage Assets, selected Cartographic Features, and present-day shoreline superimposed.

4 Survey Area 4

- RMP Site
- DCIHR
- # Map Reference Item
- # ADCO Survey Area
- # Development Item
- Present-day Shoreline



Ordnance Survey Ireland



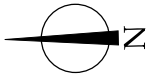
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PUBLISHED: 30/06/2023

ORDER NO.: 50343398_3

MAP SERIES: 6inch BW ED01

MAP SHEETS: DN019



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



| | | | |
|--|------------------------------------|----------------------------------|---|
| Job/Exc No. 23D0037, 23R0148 | Compiled by R. Bangerter | CAD reference 3FM_UAIA | Client RPS/ Dublin Port Company (DPC) |
| Date 30.06.23 | Scale 1:2000 | Drawing No. Figure 11 | Project Dublin Port, 3FM Project |

Title
Figure 11 - OS First Edition Map (1837) with ADCO Survey Area 4, surrounding Cultural Heritage Assets, selected Cartographic Features, and present-day shoreline superimposed.



Tailte Éireann

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ITM 718535.734295

PUBLISHED:
30/06/2023

ORDER NO.:
50343398_2

MAP SERIES:
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25 Inch Raster DN018-12
25 Inch Raster DN019-05
25 Inch Raster DN019-09



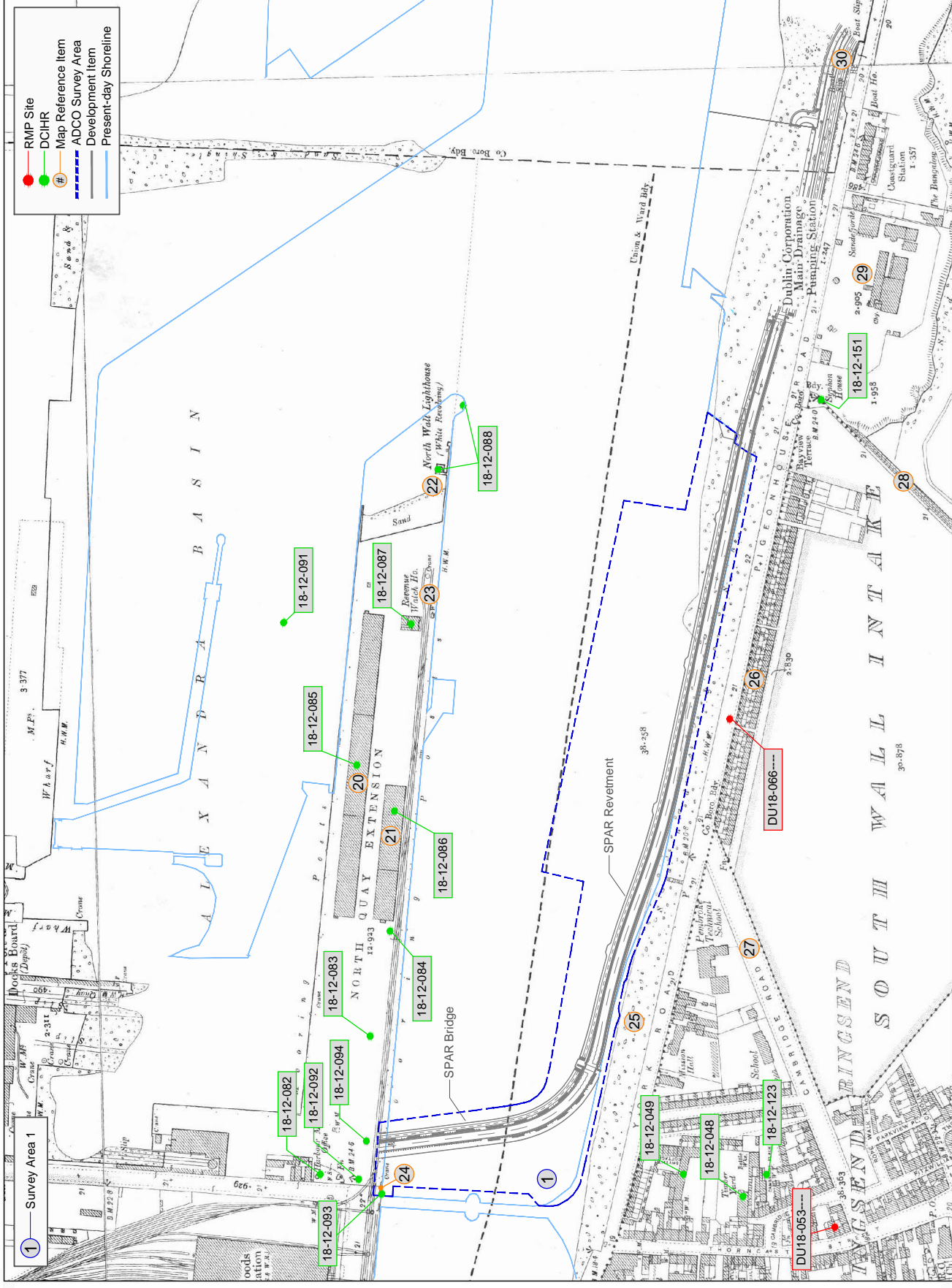
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Legend:

- RMP Site (Red dot)
- DCIHR (Green dot)
- Map Reference Item (Green circle with #)
- ADCO Survey Area Development Item (Blue dashed line)
- Present-day Shoreline (Blue solid line)



| | | | | | | | |
|--|--|------------------------|--|--|----------------------------------|---|---|
| Notes Map Source: OS Historic Map Archive - Tailte Éireann. [RMP locations - NIMS map viewer] [DCIHR locations - HeritageMaps.ie - map viewer] | | A4 | Job/Exc No. 23D0037, 23R0148 | Compiled by R. Bangerter | CAD reference 3FM_UAIA | Client RPS/ Dublin Port Company (DPC) | Title Figure 12 - OS 25-inch Edition Map (1906-09) with ADCO Survey Area 1, surrounding Cultural Heritage Assets, selected Cartographic Features, and present-day shoreline superimposed. |
| Date 30.06.23 | | Scale 1:2000 | Drawing No. Figure 12 | Project Dublin Port, 3FM Project | | | |



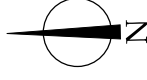


Tailte Éireann

CENTRE COORDINATES:
ITM 720324,733806

PUBLISHED: 30/06/2023
ORDER NO.: 50343398_4

MAP SERIES: 25 Inch Raster
MAP SHEETS: DN019-09

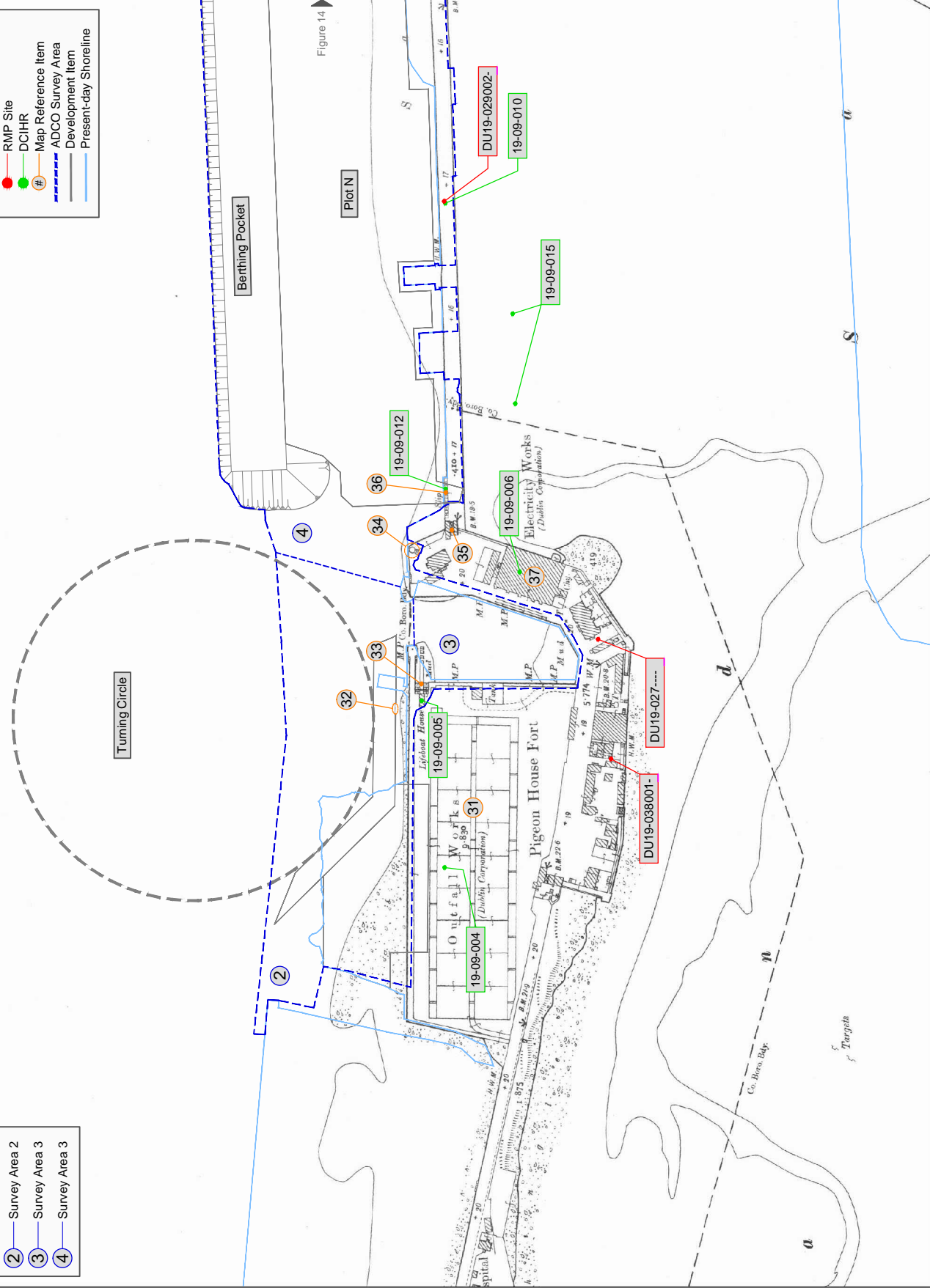


COMPILED AND PUBLISHED BY:
National Mapping Division of Tailte Éireann,
Phoenix Park,
Dublin 8,
Ireland.
D08F6E4
www.tailte.ie

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0m 50m 100m

- RMP Site
- DCIHR
- Map Reference Item
- # ADCO Survey Area
- Development Item
- Present-day Shoreline

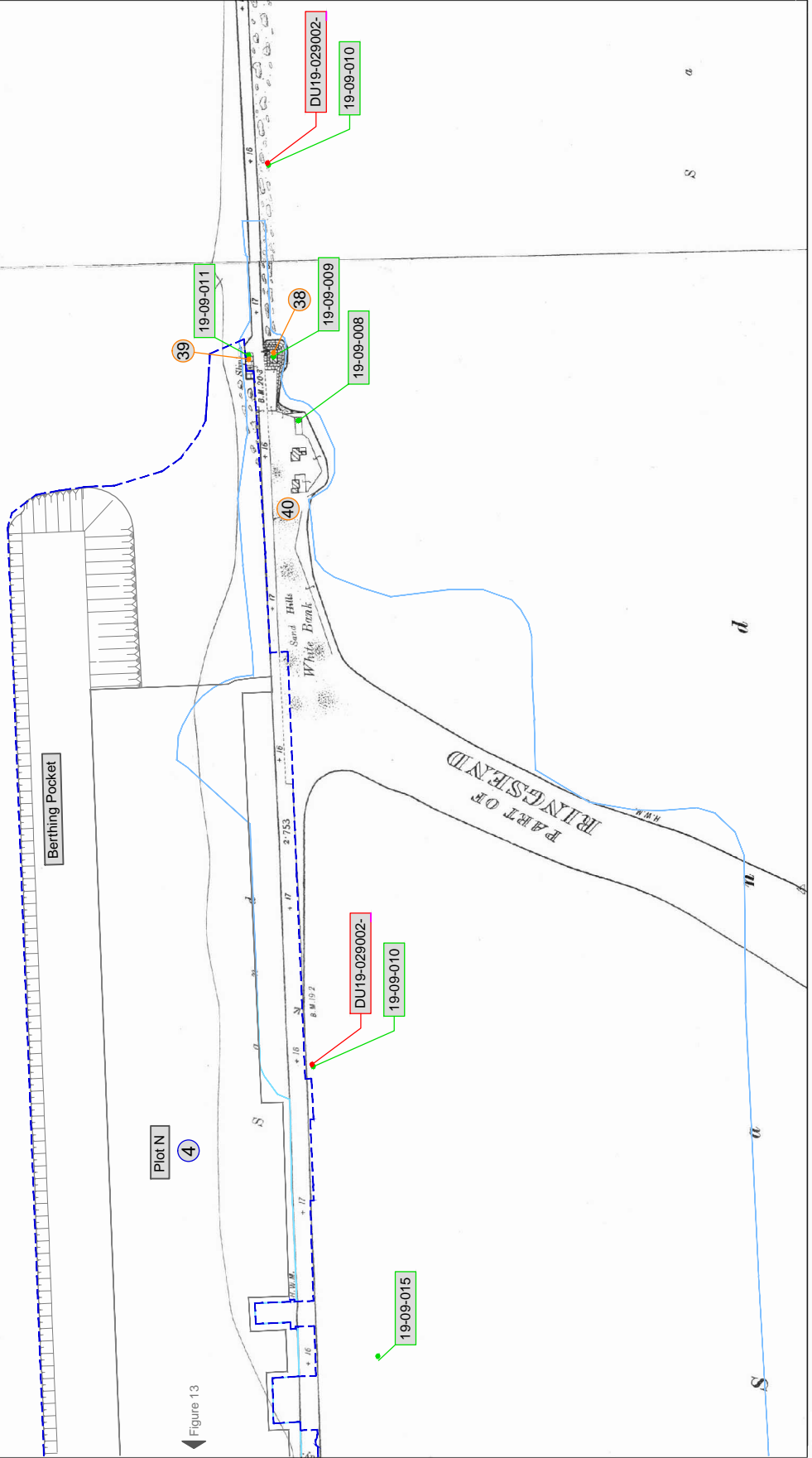


| | | | | | | |
|--|-----------|--|------------------------------------|----------------------------------|---|---|
| Notes Map Source: OS Historic Map Archive - Tailte Éireann. [RMP locations - NIMS map viewer] [DCIHR locations - HeritageMaps.ie - map viewer] | A4 | Job/Exc No. 23D0037, 23R0148 | Compiled by R. Bangerter | CAD reference 3FM_UAIA | Client RPS/ Dublin Port Company (DPC) | Title Figure 13- OS 25-inch Edition Map (1906-09) with ADCO Survey Areas 2-4, surrounding Cultural Heritage Assets, selected Cartographic Features, and present-day shoreline superimposed. |
| | | Date 30.06.23 | Scale 1:2000 | Drawing No. Figure 13 | Project Dublin Port, 3FM Project | |



4 Survey Area 4

- RMP Site
- DCIHR
- # Map Reference Item
- # ADCO Survey Area Development Item
- Present-day Shoreline

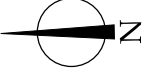


CENTRE COORDINATES:
ITM 720324,733806

PUBLISHED:
30/06/2023

ORDER NO.:
50343398_3

MAP SERIES: MAP SHEETS:
6inch BW ED01 DN019



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

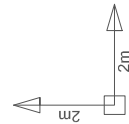
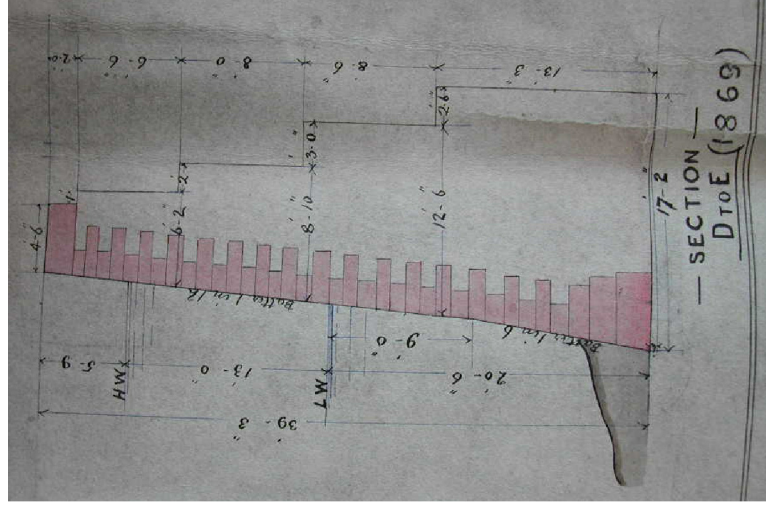
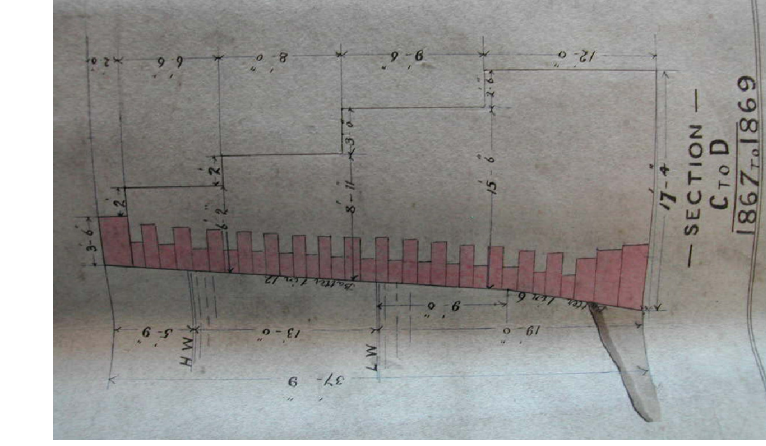
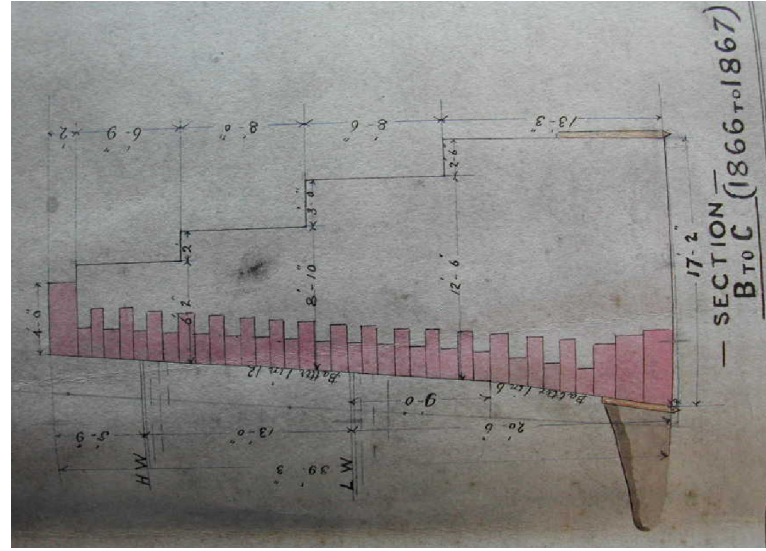
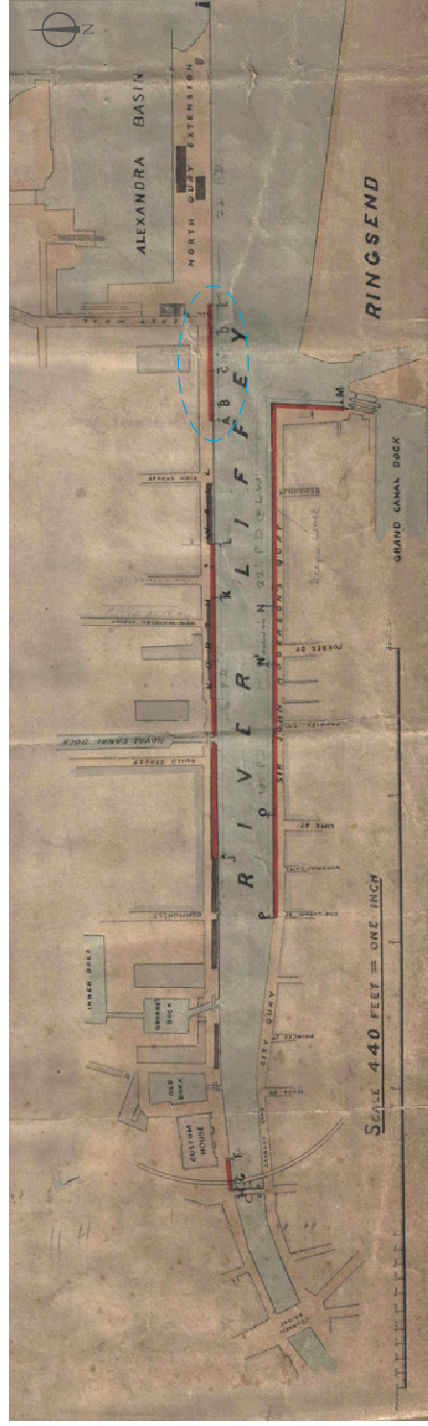
A4
Job/Exc No.
23D0037, 23R0148
Date
30.06.23

Complied by
R. Bangertner
Scale
1:2000

CAD reference
3FM_UAIA
Drawing No.
Figure 14

Client
RPS/ Dublin Port Company (DPC)
Project
Dublin Port, 3FM Project

Title
Figure 14- OS 25-inch Edition Map (1906-09) with ADCO Survey Area 4, surrounding Cultural Heritage Assets, selected Cartographic Features, and present-day shoreline superimposed.



Notes
 Source: Dublin Port Company (DPC),
 Dublin Port Archive- Drawing No. 7199,
 [drawing adapted by ADCCO].

A4

Job/Exc No.
 23D0037, 23R0148
Date
 20.07.23

Compiled by
 R. Bangerter
Scale
 1:150/ 1:1250

CAD reference
 3FM_LUA
Drawing No.
 Figure 15

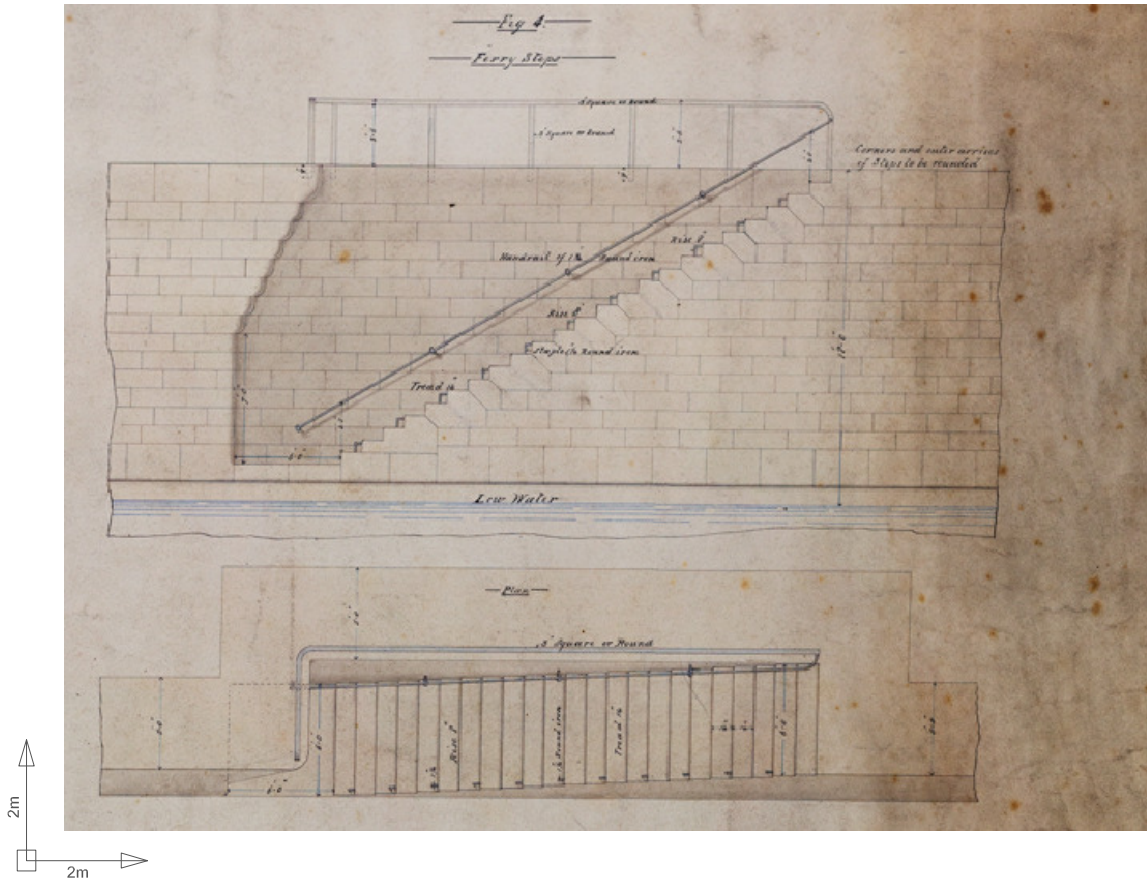
Client
 RPS/ Dublin Port Company (DPC)
Project
 Dublin Port, 3FM Project

Title
 Figure 15- Extracts from nineteenth-century
 Engineer's Drawing showing a series of
 cross-sections through the downstream
 terminus of North Wall Quay (1865-1869).



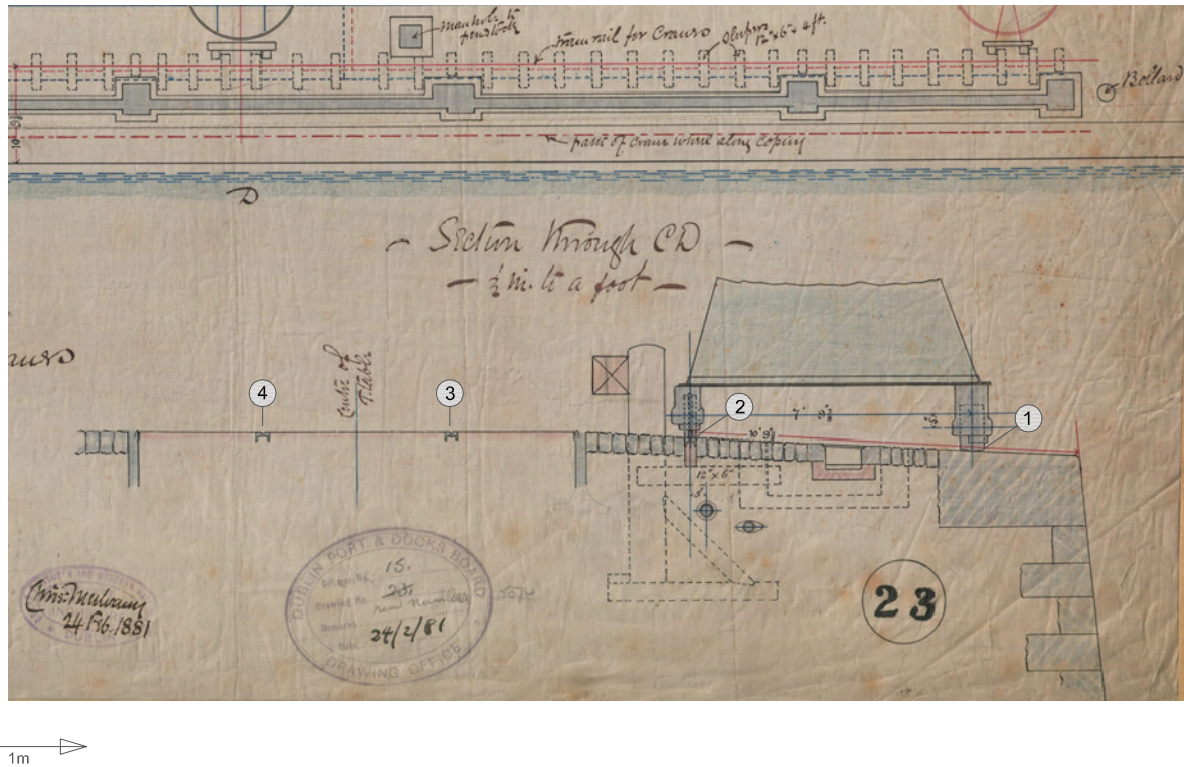
A

DPC Archive Drawing No. 5F.BBS



B

DPC Archive Drawing No. 5074



Client
RPS/ Dublin Port Company (DPC)

Notes
Source:
[A] Dublin Port Company (DPC), Dublin Port Archive-Drawing No. 5F.BBS [extract from 'North Quay Deepening Steam Berths, B.B. Stoney, 1870']
[B] Dublin Port Company (DPC), Dublin Port Archive-Drawing No. 5074 [extract from 'North Wall Goods Terminus: Dublin, Arrangement of Rail in Connexion with Traveling Cranes, Chris Mulrany, 1881']

Title
Figure 16- Extracts from Engineer's Drawings showing:
A- Design of River Access Steps (annotated 'Ferry Steps') placed along the North Wall Quay.
B- Track arrangement for Traveling Cranes placed along downstream section of North Wall Quay.

A4

Project
Dublin Port, 3FM Project

Job/Exc No.
23D0037, 23R0148

Compiled by
R.Bangertner

CAD reference
3FM_UAIA

Date
20.07.23

Scale
Top- 1:125
Bottom- 1:65

Drawing No.
Figure 16



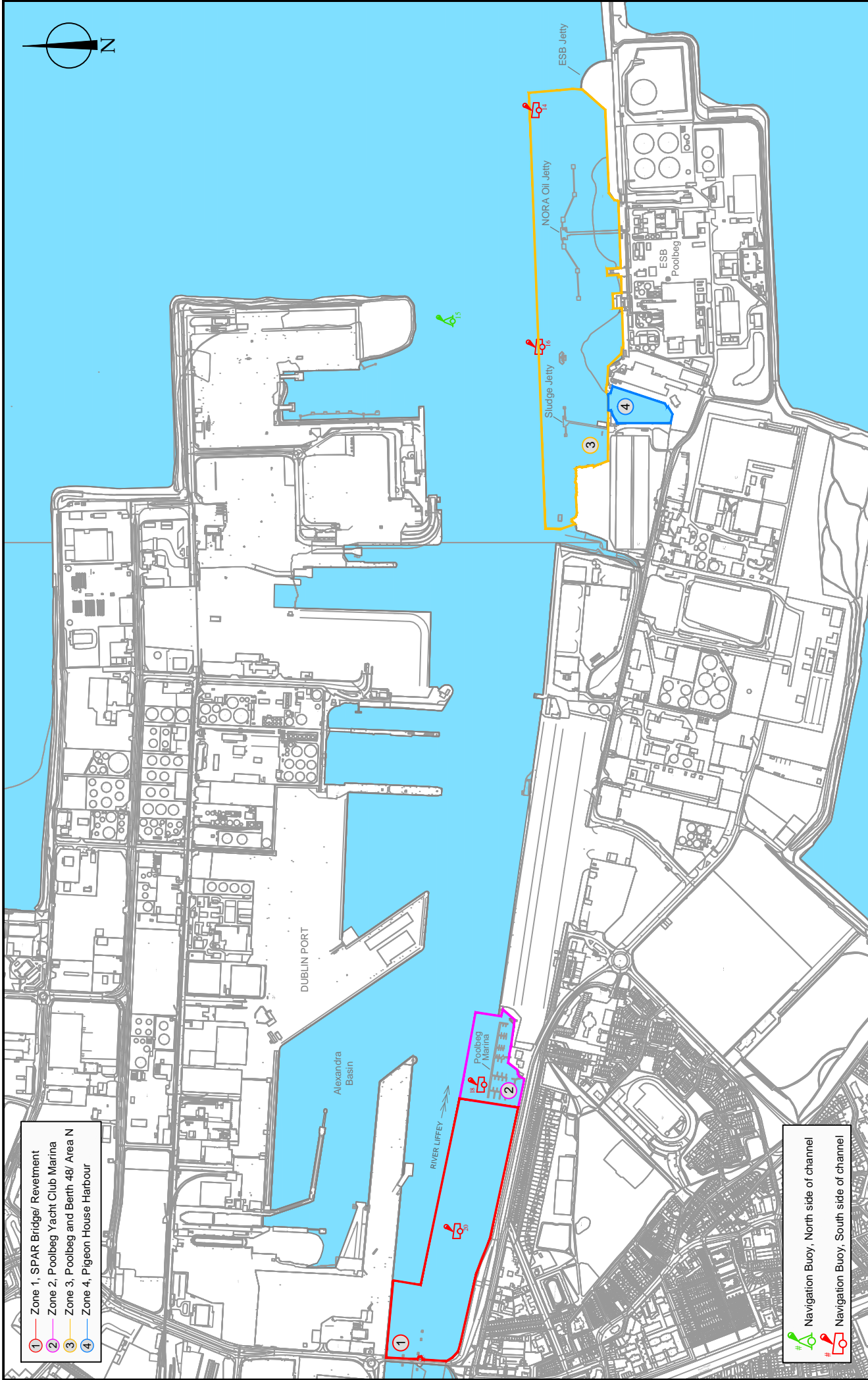
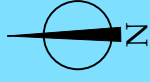
- Record of Monuments and Places [RMP]
- National Inventory of Architectural Heritage [NIAH]
- Dublin City Industrial Heritage Record [DCHIR]
- Record of Protected Structures [RPS]
- Zone of Archaeological Potential [National Monuments Act]
- Conservation Areas [Planning & Development Act]
- Visible extent of GSW & associated structures [ADCO]
- Assumed line/ buried sections of the GSW [ADCO]
- Listed Wreck-site [DHLGH Shipwreck Inventory]

Navigation Buoy, North side of channel
 Navigation Buoy, South side of channel

| | | | | | |
|----|---------------------------------|-----------------------------|---------------------------|--|---|
| A4 | Job/Exc No. 23D0037, 23R0148 | Compiled by R. Bangerter | CAD reference 3FM_UAIA | Client RPS/ Dublin Port Company (DPC) | Title Figure 17- Distribution of known Cultural Heritage Assets surrounding Dublin Port. |
| | Date 06.07.23 | Scale 1:15,000 | Drawing No. Figure 17 | Project Dublin Port, 3FM Project | |

Notes
 Source: OS Background Mapping with survey data superimposed.
 - ADCO U/w Survey undertaken 03.04.22-08.04.22
 - GSW extents based on ADCO walkover inspection.



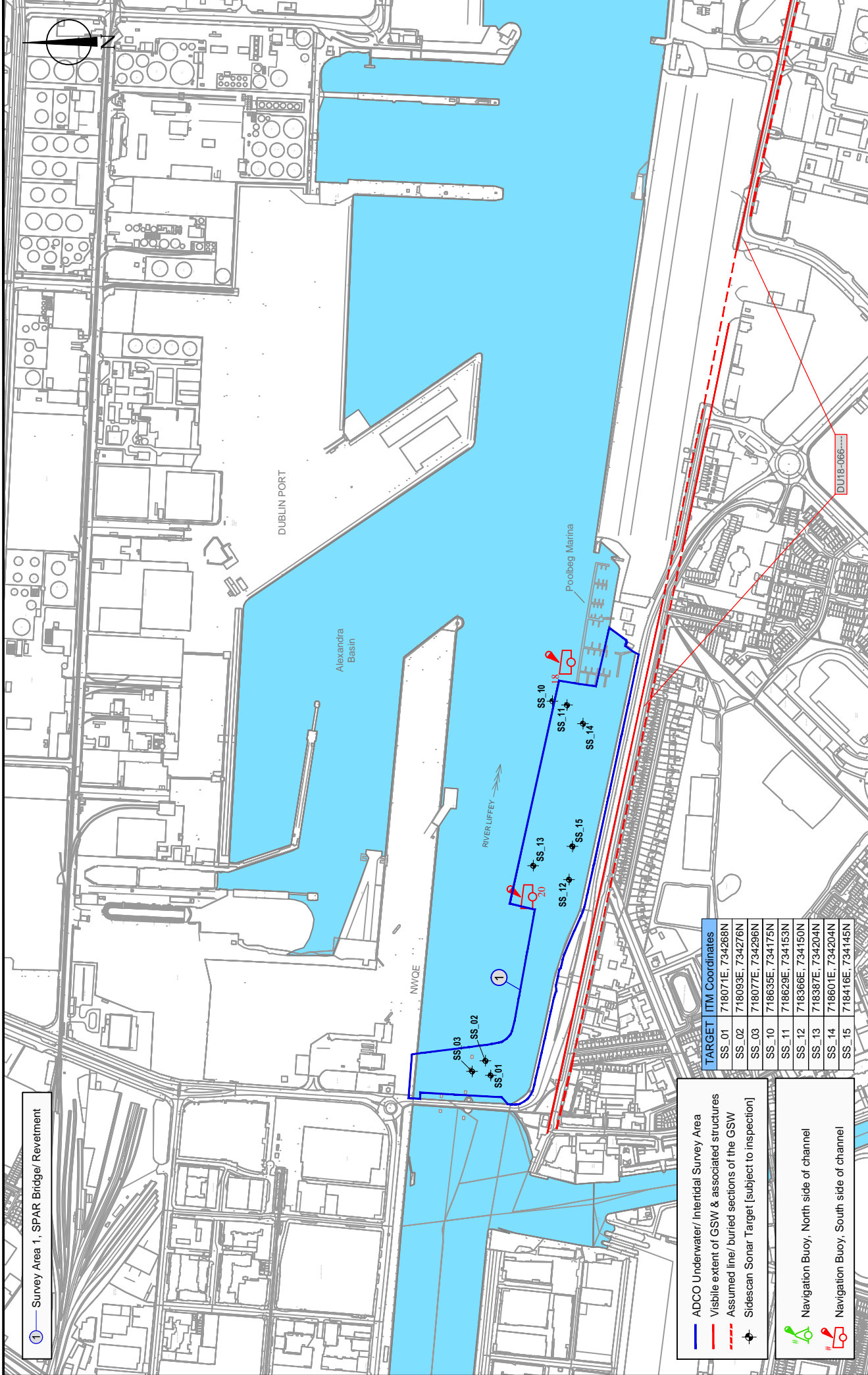


- ① Zone 1, SPAR Bridge/ Revetment
- ② Zone 2, Poolbeg Yacht Club Marina
- ③ Zone 3, Poolbeg and Berth 48/ Area N
- ④ Zone 4, Pigeon House Harbour

- Navigation Buoy, North side of channel
- Navigation Buoy, South side of channel

| | | | | | | | |
|--|--|------------------------|--|--------------------------------|--|--|--|
| Notes | | Job/Exc No. | | Client | | Title | |
| Source: OS Background Mapping with survey data superimposed. -Marine Geo Survey undertaken 26.10.22 & 16/17.11.22 | | A4 23D0037, 23R0148 | | RPS/ Dublin Port Company (DPC) | | Figure 18- Location and extent of Marine Geophysical Survey Zones 1-4. | |
| Date | | Scale | | Project | | Drawing No. | |
| 05.07.23 | | 1:12,000 | | Dublin Port, 3FM Project | | Figure 18 | |





1 Survey Area 1, SPAR Bridge/Revetment

| TARGET | ITM Coordinates |
|--------|------------------|
| SS_01 | 718071E, 734268N |
| SS_02 | 718093E, 734276N |
| SS_03 | 718077E, 734296N |
| SS_10 | 718635E, 734175N |
| SS_11 | 718629E, 734153N |
| SS_12 | 718366E, 734150N |
| SS_13 | 718387E, 734204N |
| SS_14 | 718601E, 734204N |
| SS_15 | 718416E, 734145N |

- ADCO Underwater/Intertidal Survey Area
- Visible extent of GSW & associated structures
- - - Assumed line/buried sections of the GSW
- ⚓ Sidescan Sonar Target [subject to inspection]

- Navigation Buoy, North side of channel
- Navigation Buoy, South side of channel



Notes
 Sources: OS Background Mapping with survey data superimposed.
 - Marine Geo Survey undertaken 26.10.22 & 16/17.11.22
 - ADCO U/w Survey undertaken 03.04.22-08.04.22
 - GSW extents based on ADCO walkover inspection.

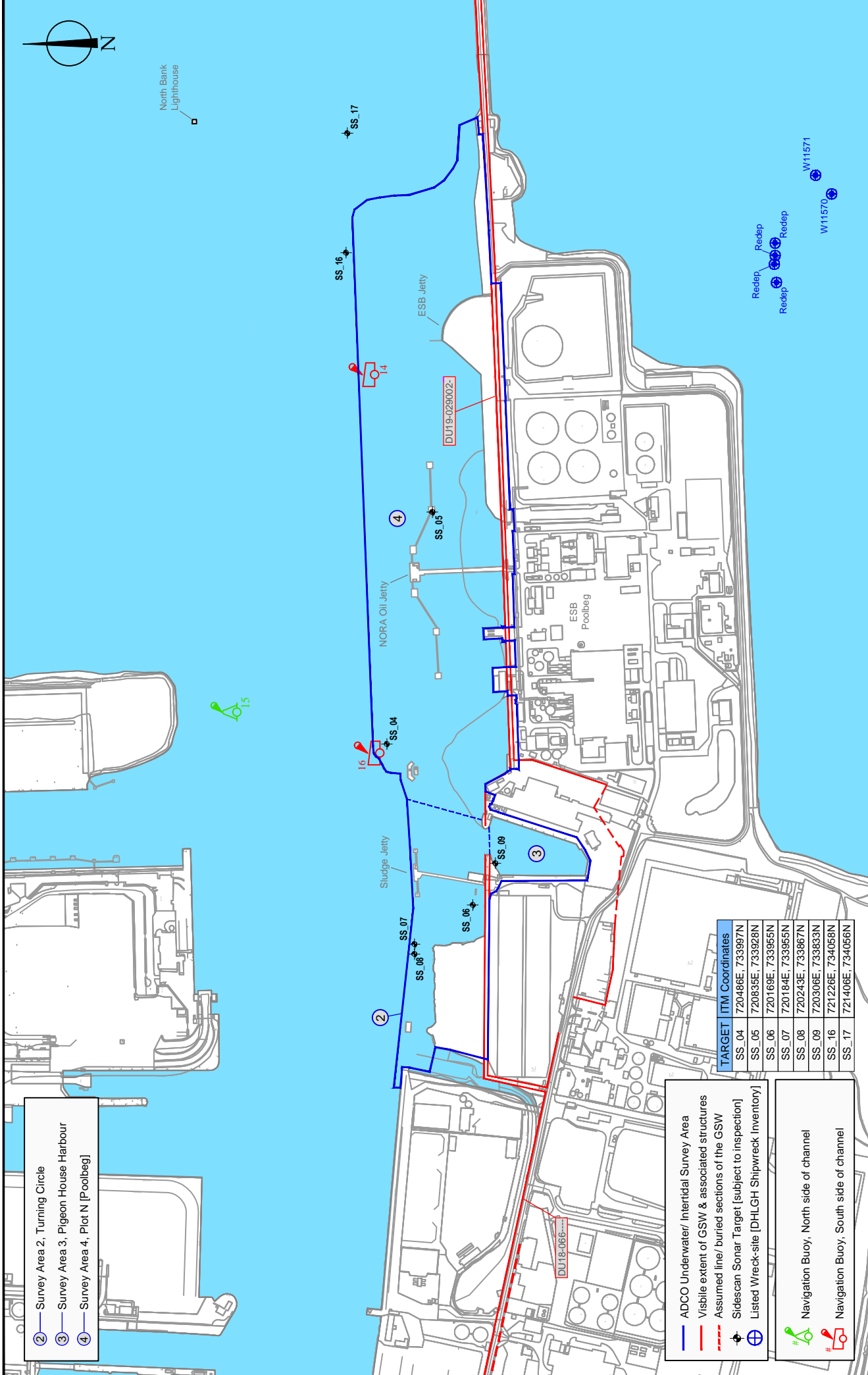
A4
Job/Exc No. 23D0037, 23R0148
Date 05.07.23

Completed by R. Bangeter
Scale 1:7,500

CAD reference 3FM_UAIA
Drawing No. Figure 19

Client RPS/ Dublin Port Company (DPC)
Project Dublin Port, 3FM Project

Title Figure 19- Extent of ADCO Survey Area 1 and location of associated Marine Geophysical Survey Targets subject to inspection. [see Figure 20 for ADCO Survey Areas 2-4]



- ② Survey Area 2, Turning Circle
- ③ Survey Area 3, Pigeon House Harbour
- ④ Survey Area 4, Plot N [Poolbeg]

- ADCO Underwater/ Intertidal Survey Area
- Visible extent of GSW & associated structures
- Assumed line/ buried sections of the GSW
- Sidescan Sonar Target [subject to inspection]
- Listed Wreck-site [DHLGH Shipwreck inventory]
- Navigation Buoy, North side of channel
- Navigation Buoy, South side of channel

| TARGET | ITM Coordinates |
|--------|------------------|
| SS_04 | 720486E, 733997N |
| SS_05 | 720835E, 733928N |
| SS_06 | 720169E, 733955N |
| SS_07 | 720184E, 733955N |
| SS_08 | 720243E, 733867N |
| SS_09 | 720306E, 733833N |
| SS_16 | 721226E, 734058N |
| SS_17 | 721406E, 734056N |

Notes
 Source: OS Background Mapping with survey data superimposed.
 - Marine Geo Survey undertaken 26.10.22 & 16/17.11.22
 - ADCO U/w Survey undertaken 03.04.22-08.04.22
 - GSW extents based on ADCO walkover inspection.



Title
 Figure 20- Extent of ADCO Survey Areas 2-4 and location of associated Marine Geophysical Survey Targets subject to inspection.
 [see Figure 19 for ADCO Survey Area 1]

Client
 RPS/ Dublin Port Company (DPC)

Project
 Dublin Port, 3FM Project

CAD reference
 3FM_UAIA

Drawing No.
 Figure.20

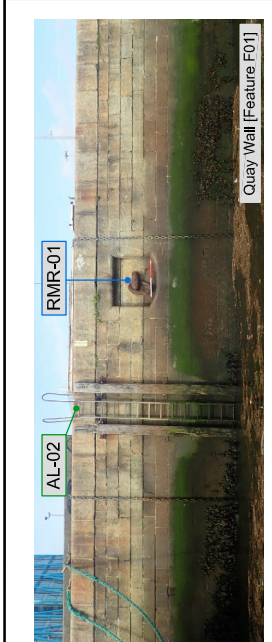
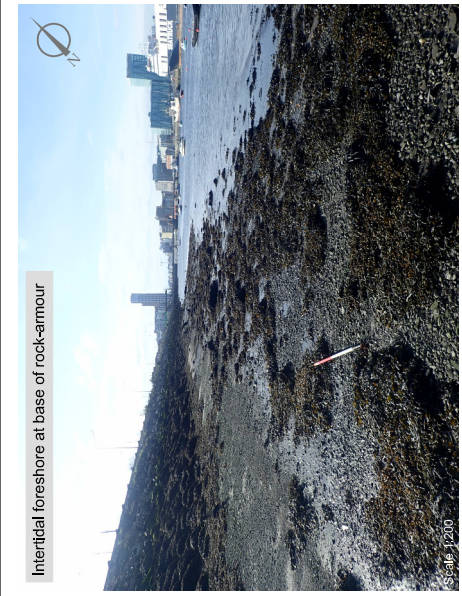
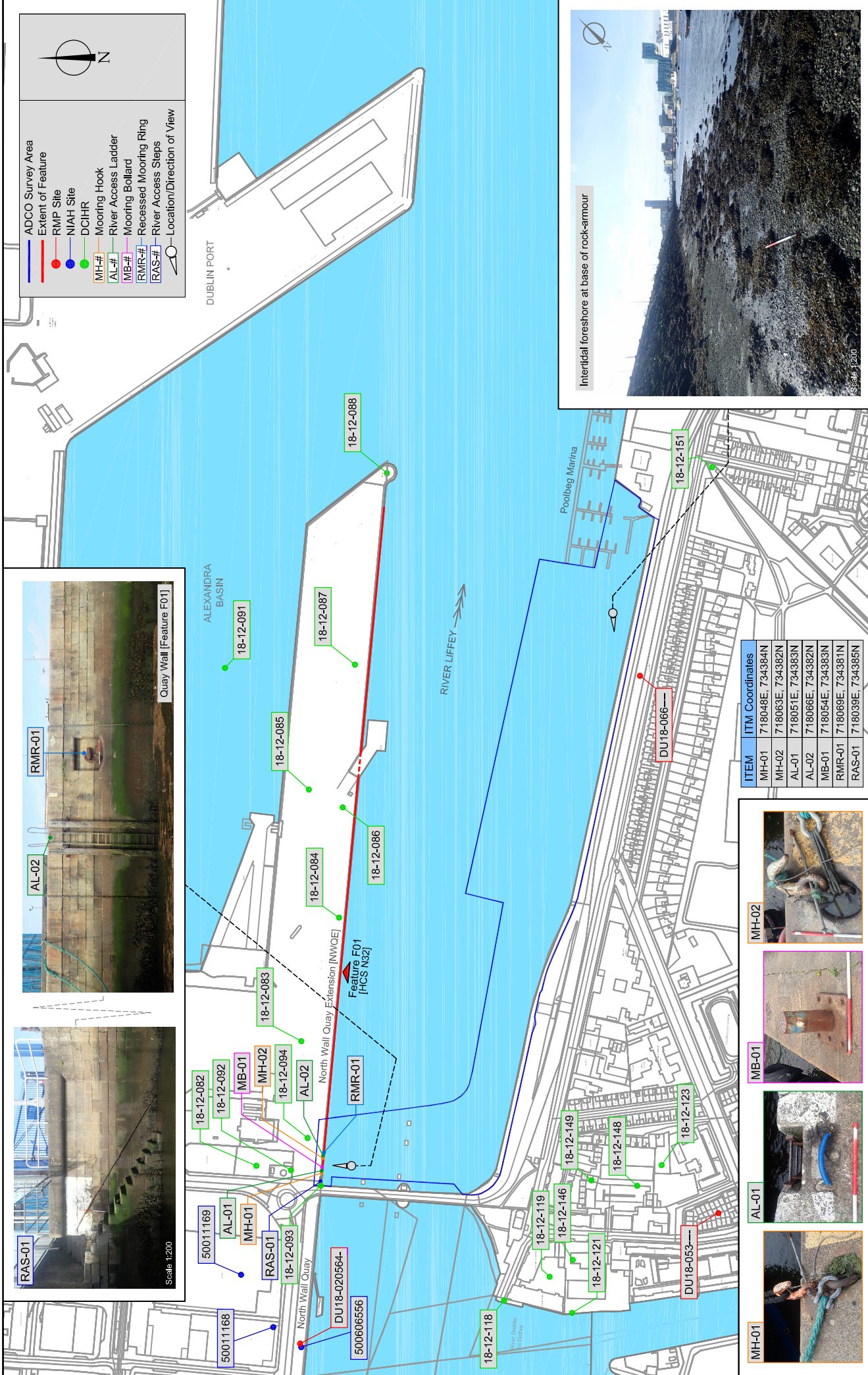
Compiled by
 R. Bangerter

Scale
 1:7,500

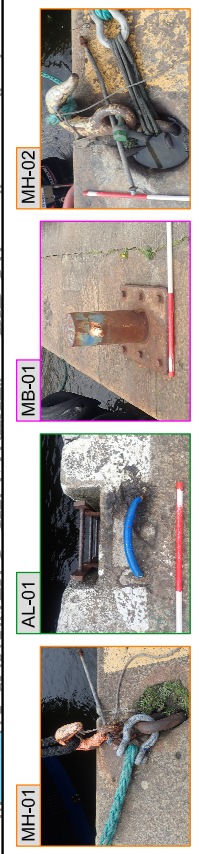
Job/Exc No.
 23D0037, 23R0148

Date
 05.07.23

A4



| ITEM | ITM Coordinates |
|--------|------------------|
| MH-01 | 718048E, 734384N |
| MH-02 | 718063E, 734382N |
| AL-01 | 718051E, 734383N |
| AL-02 | 718066E, 734382N |
| MB-01 | 718054E, 734383N |
| RMR-01 | 718089E, 734381N |
| RAS-01 | 718039E, 734385N |



ADCO

Notes

- ADCO survey [03/04, 04, 2023] superimposed on OS Background Mapping.
- Feature F01 [NWQE] subject to Laser-scan Survey, see Figure 28.

Job/Exc No. 23D0037, 23R0148

Date 02.05.23

Compiled by R. Bangster

Scale Main- 1:5000
Inset- As Shown

CAD reference 3FM_UAIA

Client RPS/ Dublin Port Company (DPC)

Project Dublin Port, 3FM Project

Drawing No. Figure 21

Title Figure 21- ADCO Survey Area 1 (SPAR Bridge/ Revetment) with Survey Items/Features and known Cultural Heritage Assets superimposed.



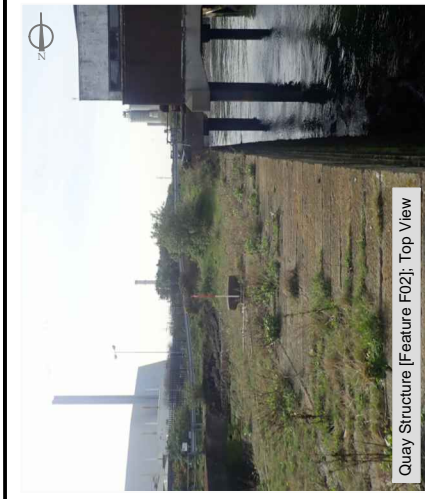
Quay Wall [Feature F02]: Channel Side



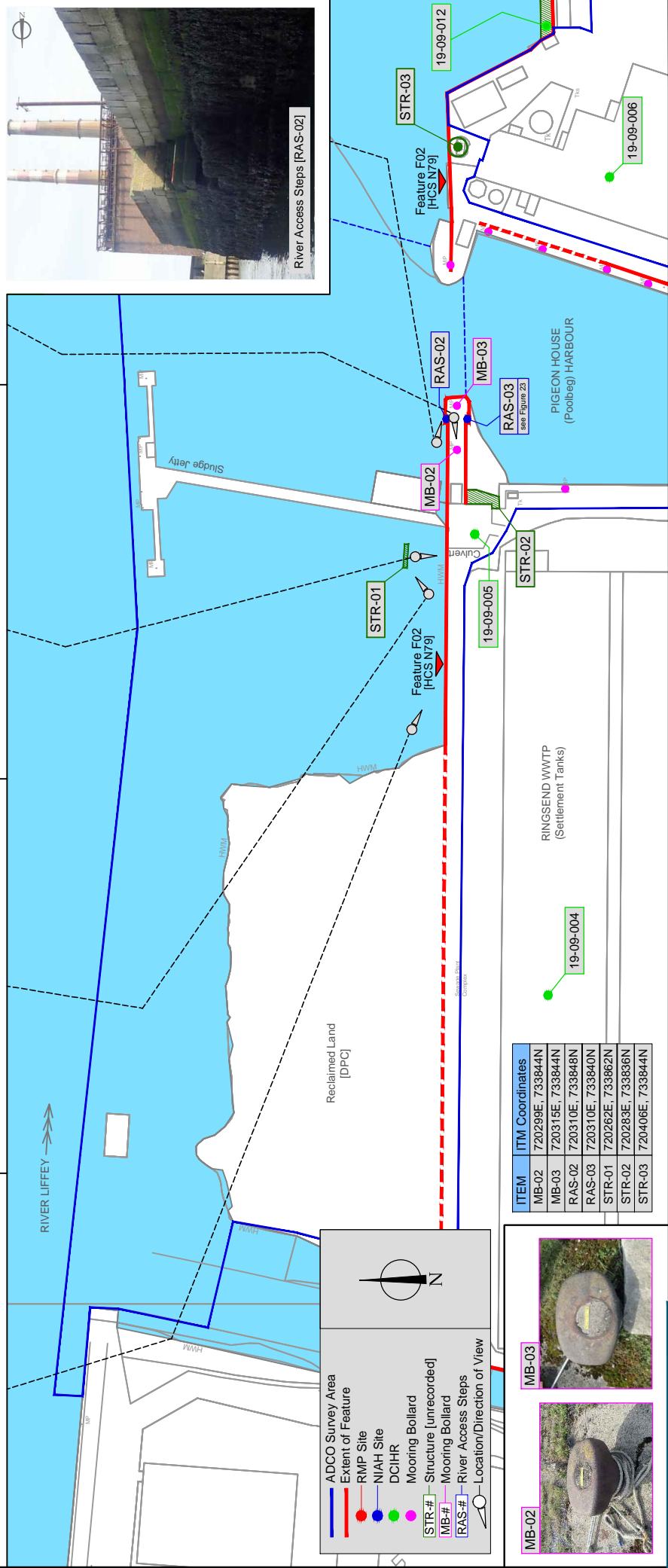
Timber Structure [STR-01]



Irish Water Culvert



Quay Structure [Feature F02]: Top View



Notes

- ADCO survey [05/07.04.2023] superimposed on OS Background Mapping.
- Quay Wall [Feature F02] subject to Laser-scan Survey, see Figures 29-30 and 31-34.

A4

Job/Exc No. 23D0037, 23R0148
Date 18.05.23

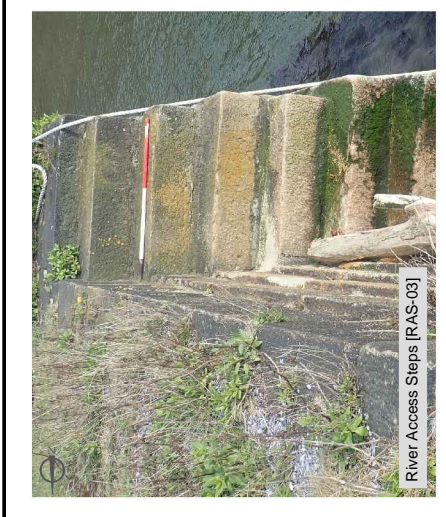
Completed by R. Bangeter
Scale 1:2000

CAD reference 3FM_UAIA
Drawing No. Figure 22

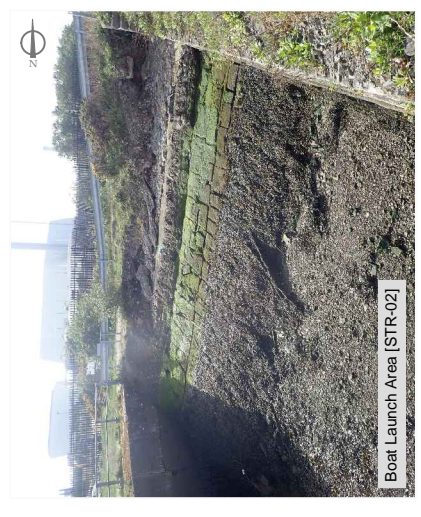
Client RPS/ Dublin Port Company (DPC)
Project Dublin Port, 3FM Project

Title Figure 22- ADCO Survey Area 2 (Turning Circle) with Survey Items/Features and known Cultural Heritage Assets superimposed.

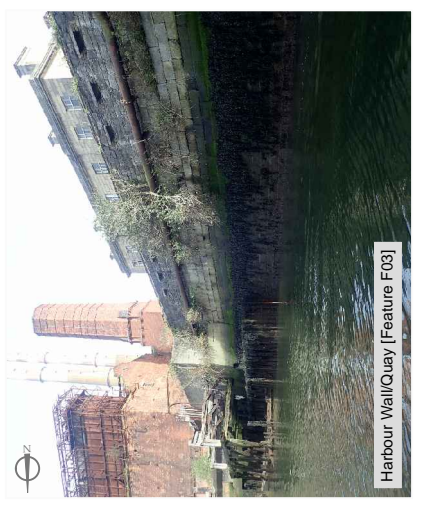




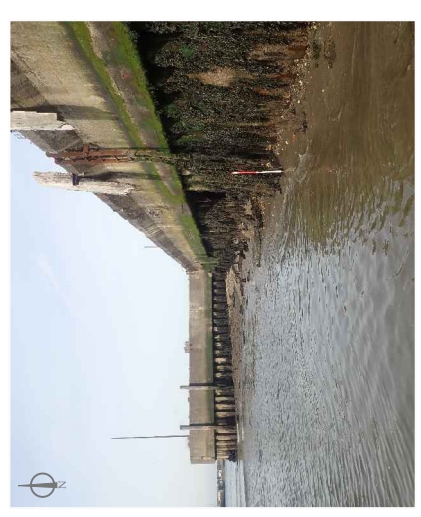
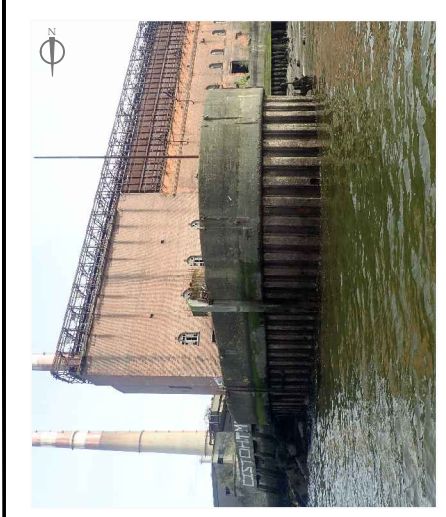
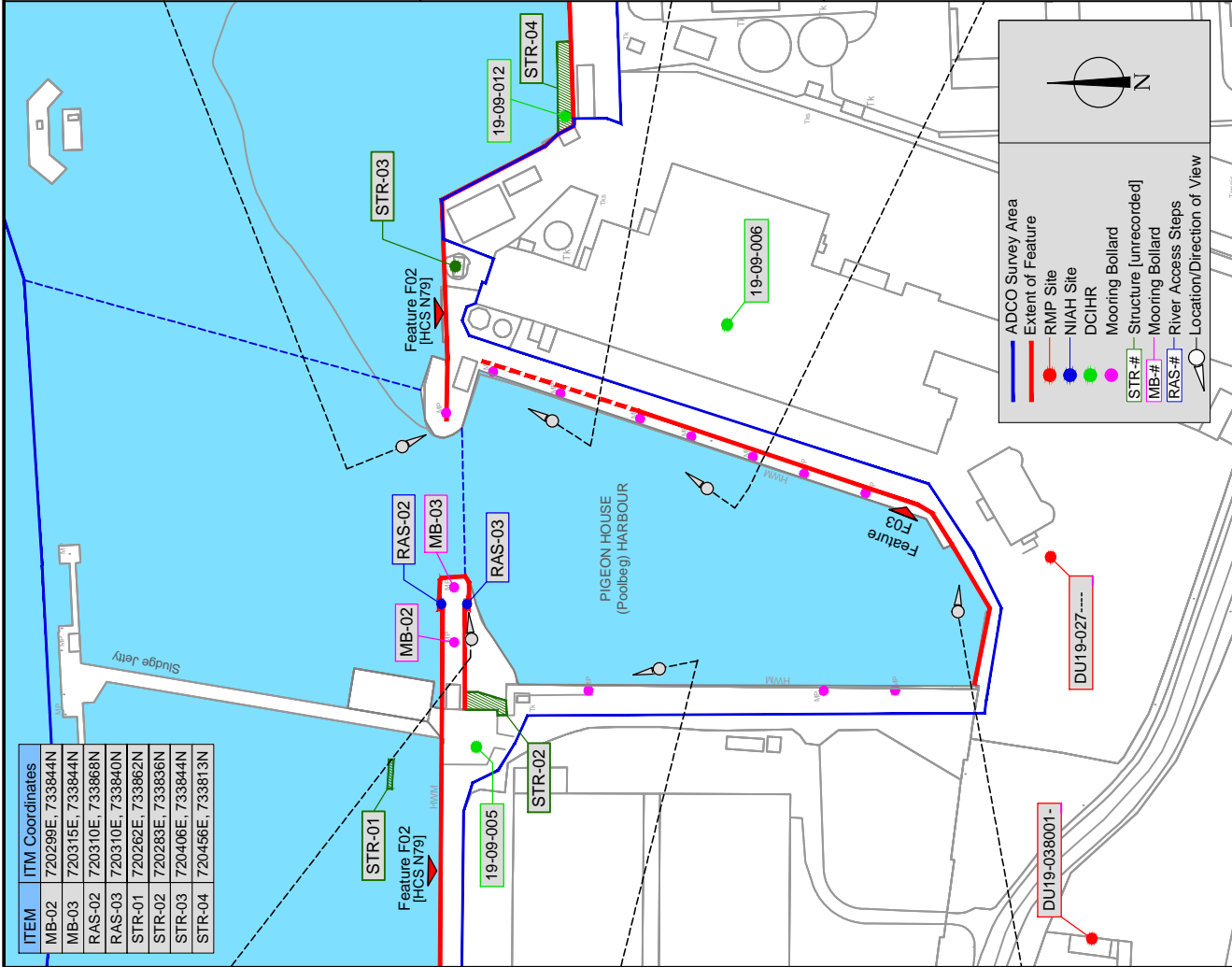
River Access Steps [RAS-03]



Boat Launch Area [STR-02]



Harbour Wall/Quay [Feature F03]



Notes
 - ADSCO survey [05/07.04.2023] superimposed on OS Background Mapping.
 - Quay/Wall/Features F02-F03 subject to Laser-scan Survey, see Figures 29-35.



| | | | | |
|-----------|--|------------------------------------|----------------------------------|---|
| A4 | Job/Exc No. 23D0037, 23R0148 | Compiled by R. Bangerter | CAD reference 3FM_UAIA | Client RPS/ Dublin Port Company (DPC) |
| | Date 26.06.23 | Scale 1:2000 | Drawing No. Figure 23 | Project Dublin Port, 3FM Project |

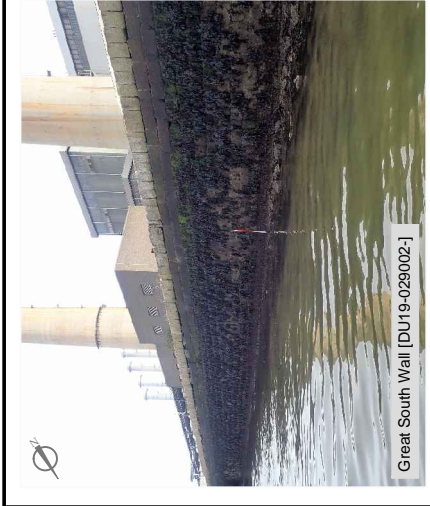
Title
 Figure 23- ADSCO Survey Area 3 (Pigeon House Harbour) with Survey Items/Features and known Cultural Heritage Assets superimposed.



Quay Wall Feature F02; Channel Side



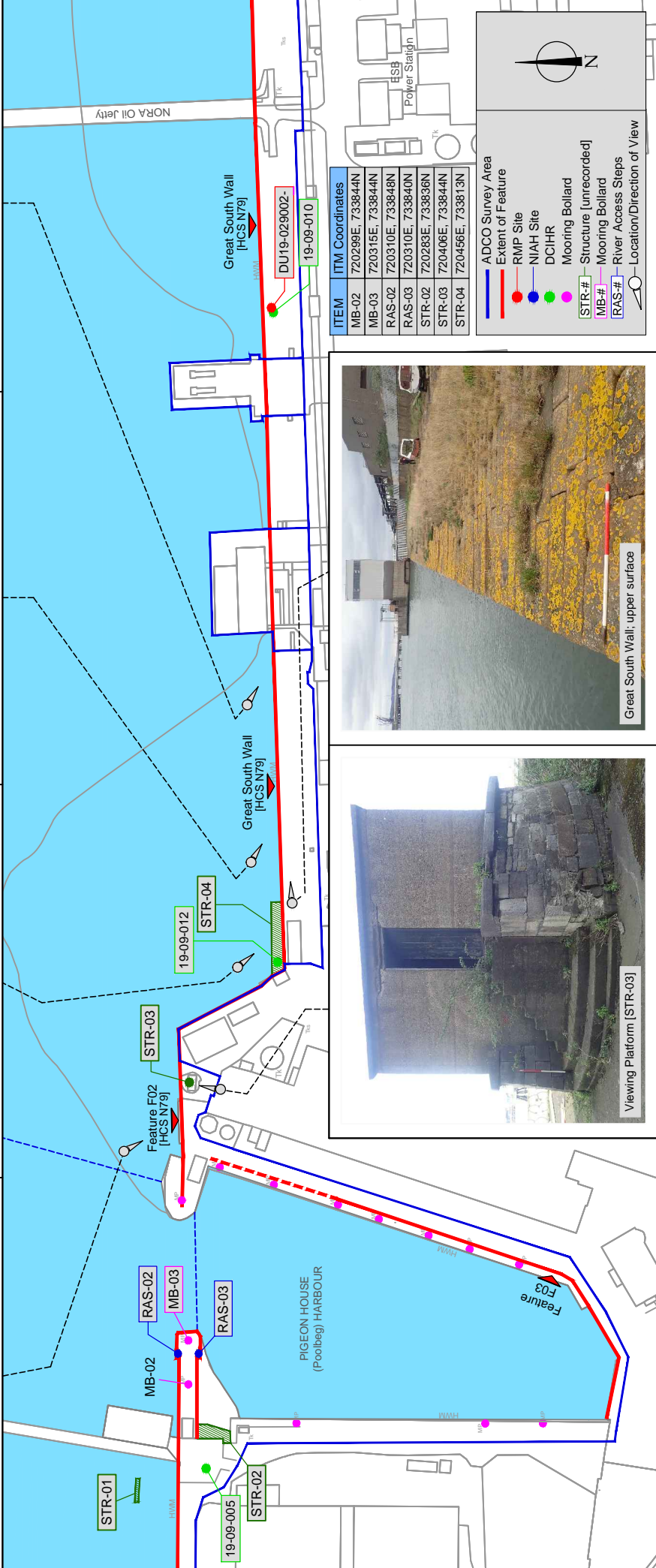
Masonry Slipway [STR-04]



Great South Wall [DU19-029002-]



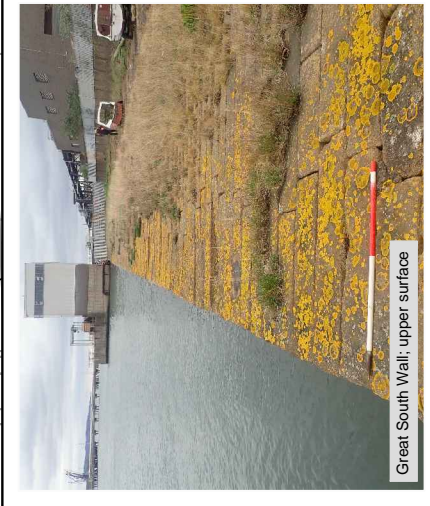
Great South Wall [DU19-029002-]



| ITEM | ITM Coordinates |
|--------|------------------|
| MB-02 | 720299E, 733844N |
| MB-03 | 720315E, 733844N |
| RAS-02 | 720310E, 733848N |
| RAS-03 | 720310E, 733840N |
| STR-02 | 720283E, 733836N |
| STR-03 | 720406E, 733844N |
| STR-04 | 720456E, 733813N |

ADCO Survey Area

- Extent of Feature
- RMP Site
- NIAH Site
- DCIHR
- Mooring Bollard
- Structure [unrecorded]
- Mooring Bollard
- Mooring Bollard
- River Access Steps
- Location/Direction of View



Great South Wall, upper surface



Viewing Platform [STR-03]

ADCO

Notes

- ADCO survey [05/07.04.2023] superimposed on OS Background Mapping.
- Great South Wall subject to Laser-scan Survey, see Figures 36-45.

Title Figure 24- ADCO Survey Area 4 (Plot N, West) with Survey Items/Features and known Cultural Heritage Assets superimposed.

Client RPS/ Dublin Port Company (DPC)

Project Dublin Port, 3FM Project

CAD reference 3FM_UAIA

Drawing No. Figure 24

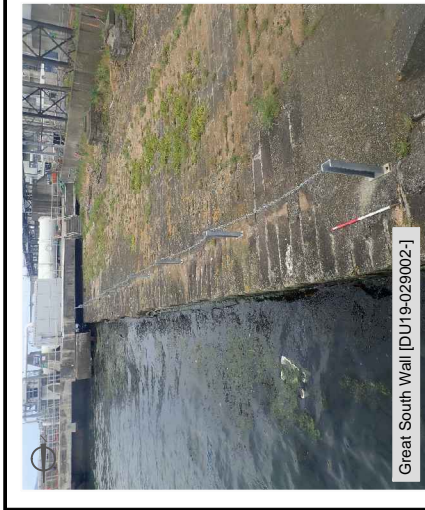
Compiled by R. Bangerter

Scale 1:2000

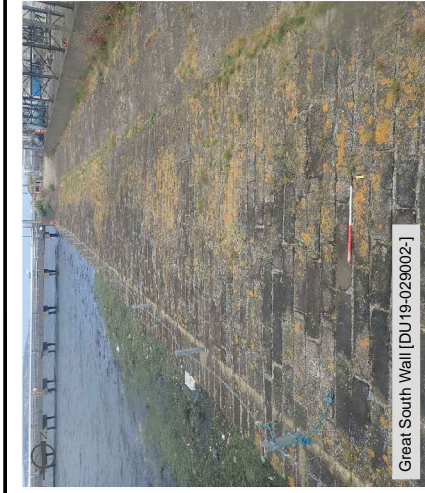
Job/Exc. No. 23D0037, 23R0148

Date 29.06.23

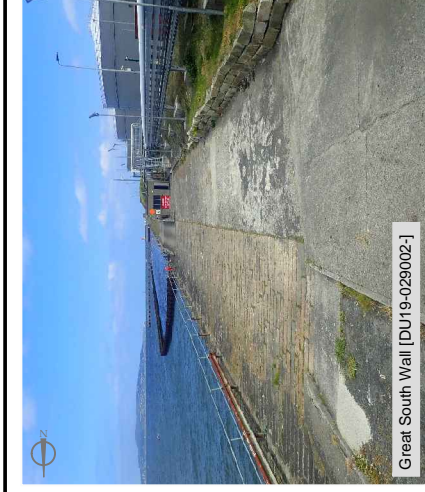
A4



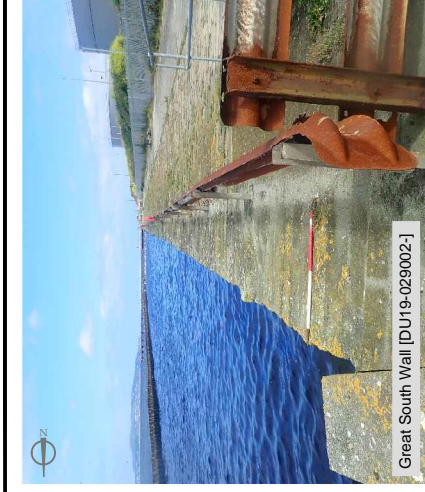
Great South Wall [DU19-029002-]



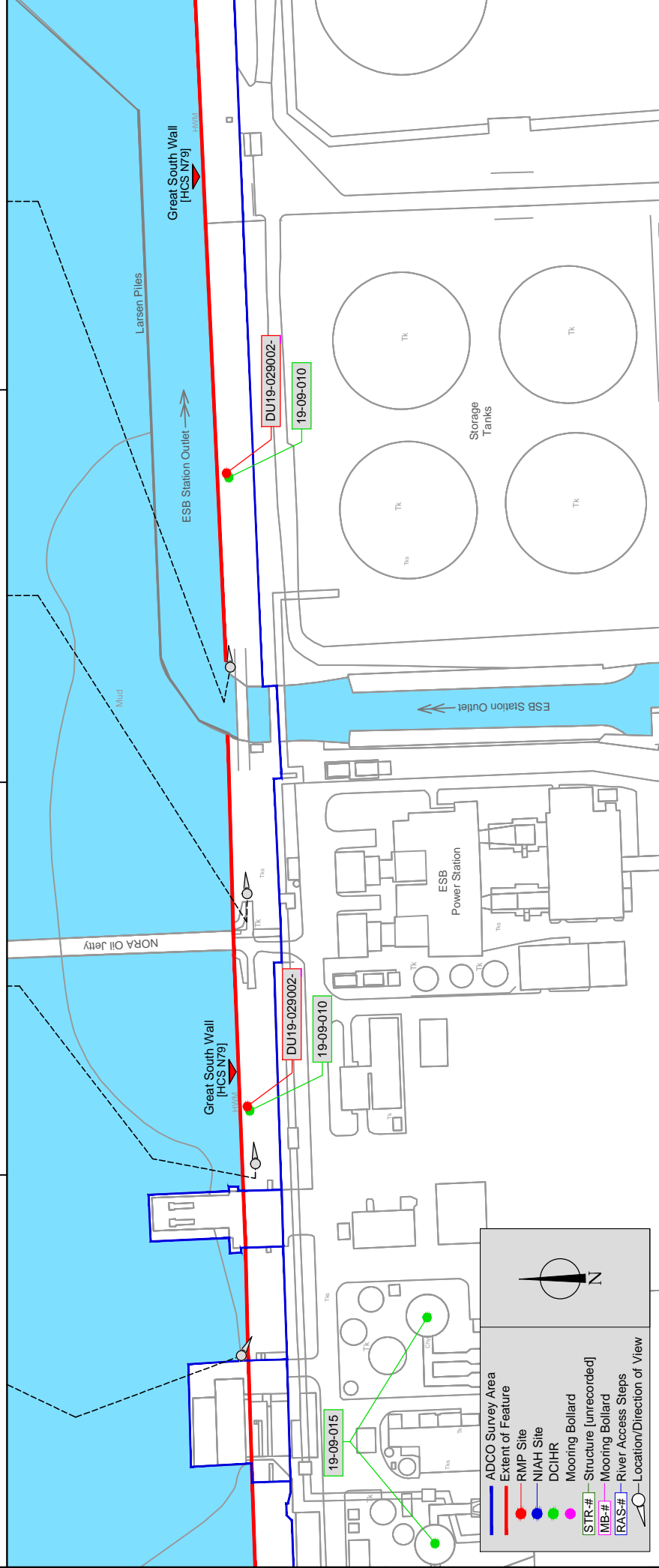
Great South Wall [DU19-029002-]



Great South Wall [DU19-029002-]



Great South Wall [DU19-029002-]

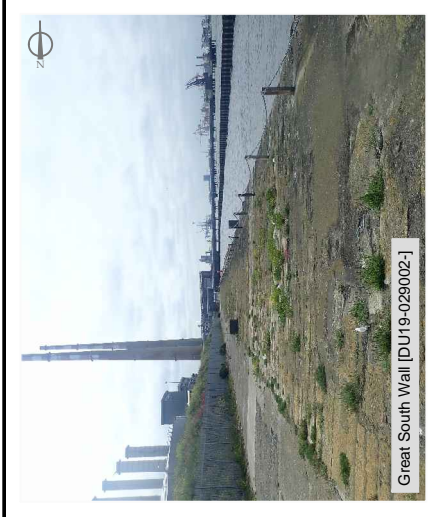


Legend

- ADCO Survey Area
- Extent of Feature
- RMP Site
- NIAH Site
- DCHHR
- Mooring Bollard
- Structure [unrecorded]
- Mooring Bollard
- RAS-#
- River Access Steps
- Location/Direction of View

| | | | | | | |
|---|----|---|---|---|---|--|
| Notes - ADCO survey [05/07.04.2023] superimposed on OS Background Mapping. - Great South Wall subject to Laser-scan Survey, see Figures 36-45. | A4 | Job/Exc No. 23D0037, 23R0148 Date 29.06.23 | Compiled by R. Bangeter Scale 1:2000 | CAD reference 3FM_UAIA Drawing No. Figure 25 | Client RPS/ Dublin Port Company (DPC) Project Dublin Port, 3FM Project | Title Figure 25- ADCO Survey Area 4 (Plot N, Centre) with Survey Items/Features and known Cultural Heritage Assets superimposed. |
|---|----|---|---|---|---|--|

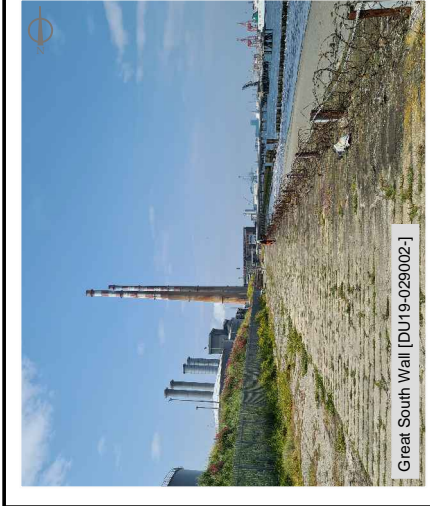




Great South Wall [DU19-029002-]



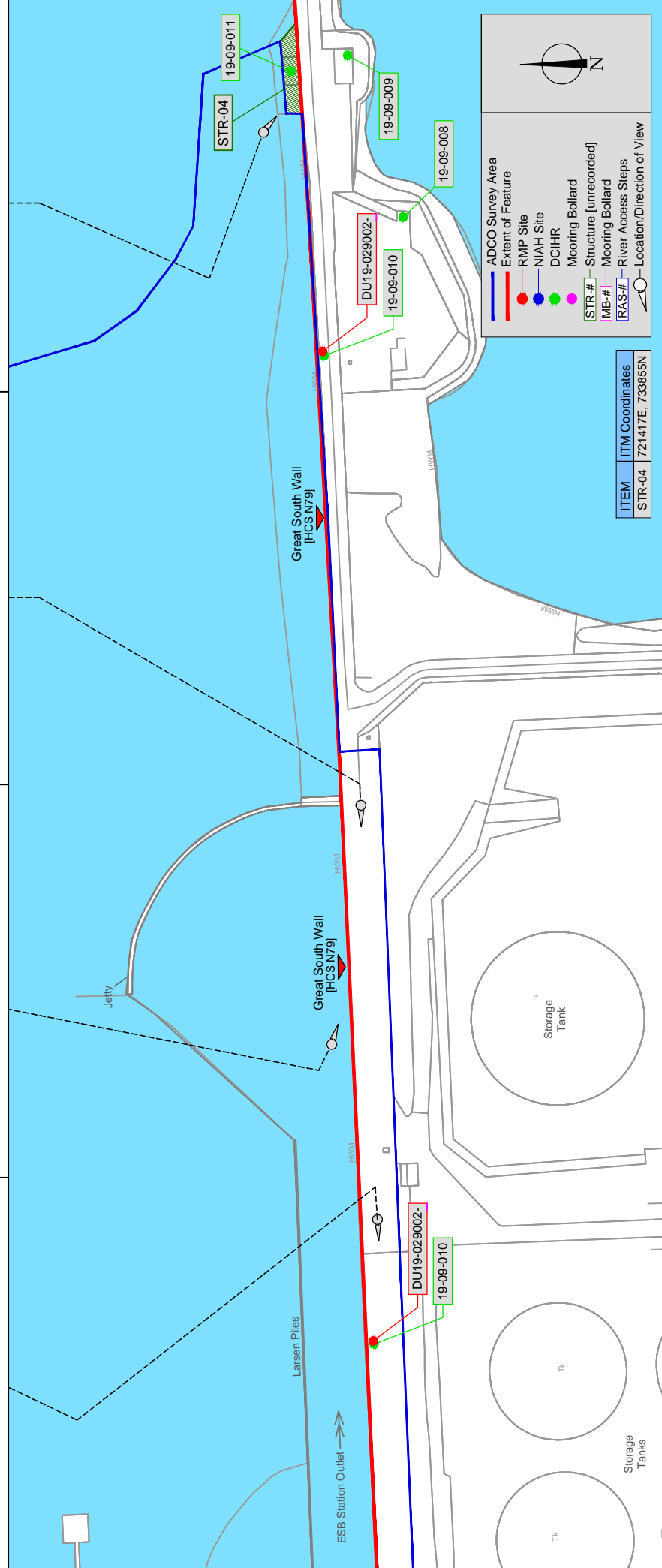
Great South Wall [DU19-029002-]



Great South Wall [DU19-029002-]



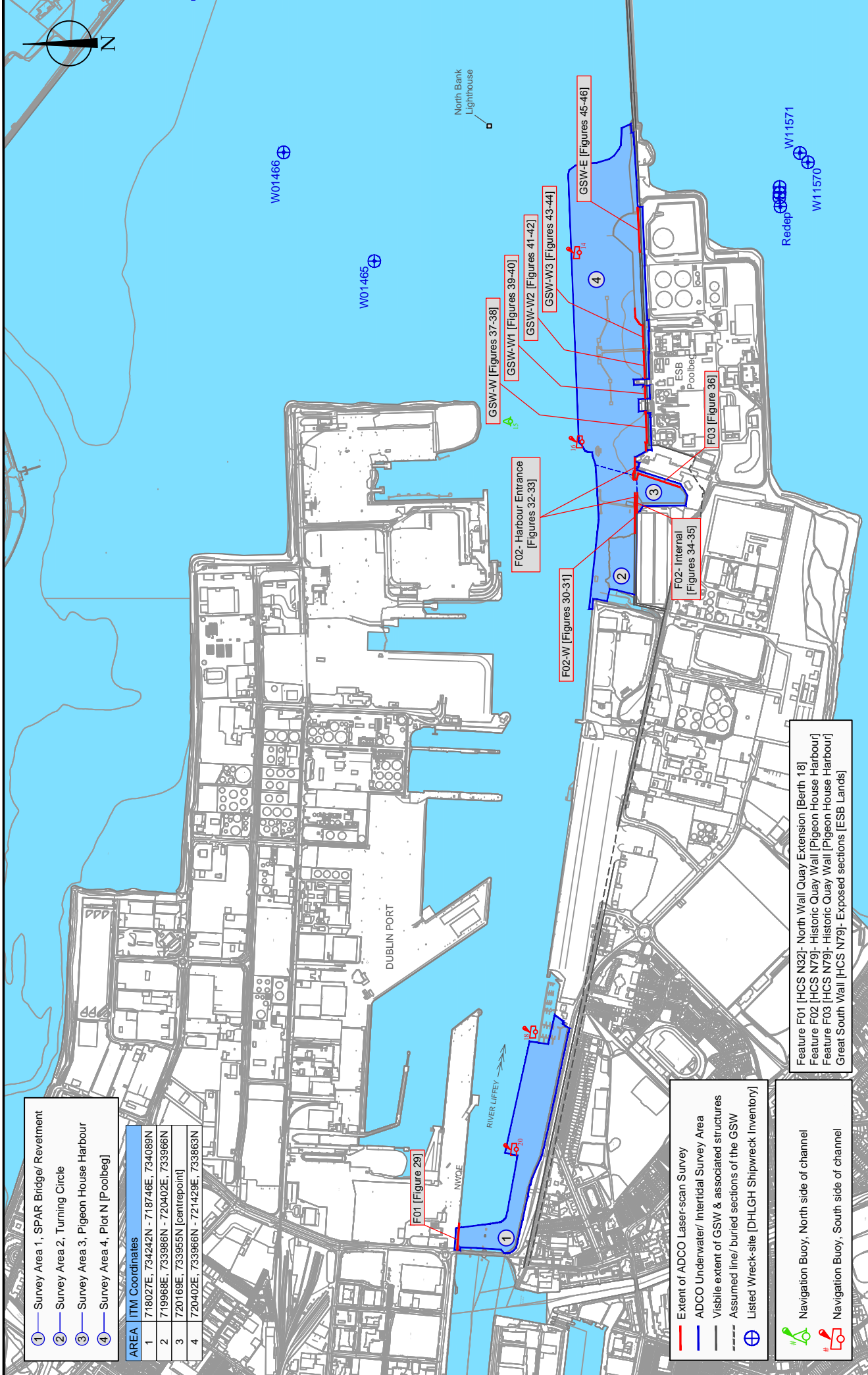
Masonry Slipway [STR-04]



Notes
 - ADCO survey [05/07.04.2023] superimposed on OS Background Mapping.
 - Great South Wall subject to Laser-scan Survey, see Figure 36-45.



| | |
|---|--|
| Job/Exc. No. 23D0037, 23R0148 | Client RPS/ Dublin Port Company (DPC) |
| Date 29.06.23 | Project Dublin Port, 3FM Project |
| Scale 1:2000 | CAD reference 3FM_UAIA |
| Compiled by R. Bangerter | Drawing No. Figure 26 |
| A4 | Title Figure 26- ADCO Survey Area 4 (Plot N, East) with Survey Items/Features and known Cultural Heritage Assets superimposed. |



| | |
|---|---------------------------------------|
| ① | Survey Area 1, SPAR Bridge/ Revetment |
| ② | Survey Area 2, Turning Circle |
| ③ | Survey Area 3, Pigeon House Harbour |
| ④ | Survey Area 4, Plot N [Poolbeg] |

| AREA | ITM Coordinates |
|------|-------------------------------------|
| 1 | 718027E, 734242N - 718746E, 734089N |
| 2 | 719968E, 733986N - 720402E, 733966N |
| 3 | 720169E, 733955N [centrepoint] |
| 4 | 720402E, 733966N - 721429E, 733863N |

- Extent of ADCO Laser-scan Survey
- ADCO Underwater/ Intertidal Survey Area
- Visible extent of GSW & associated structures
- Assumed line/ buried sections of the GSW
- ⊕ Listed Wreck-site [DHLGH Shipwreck Inventory]

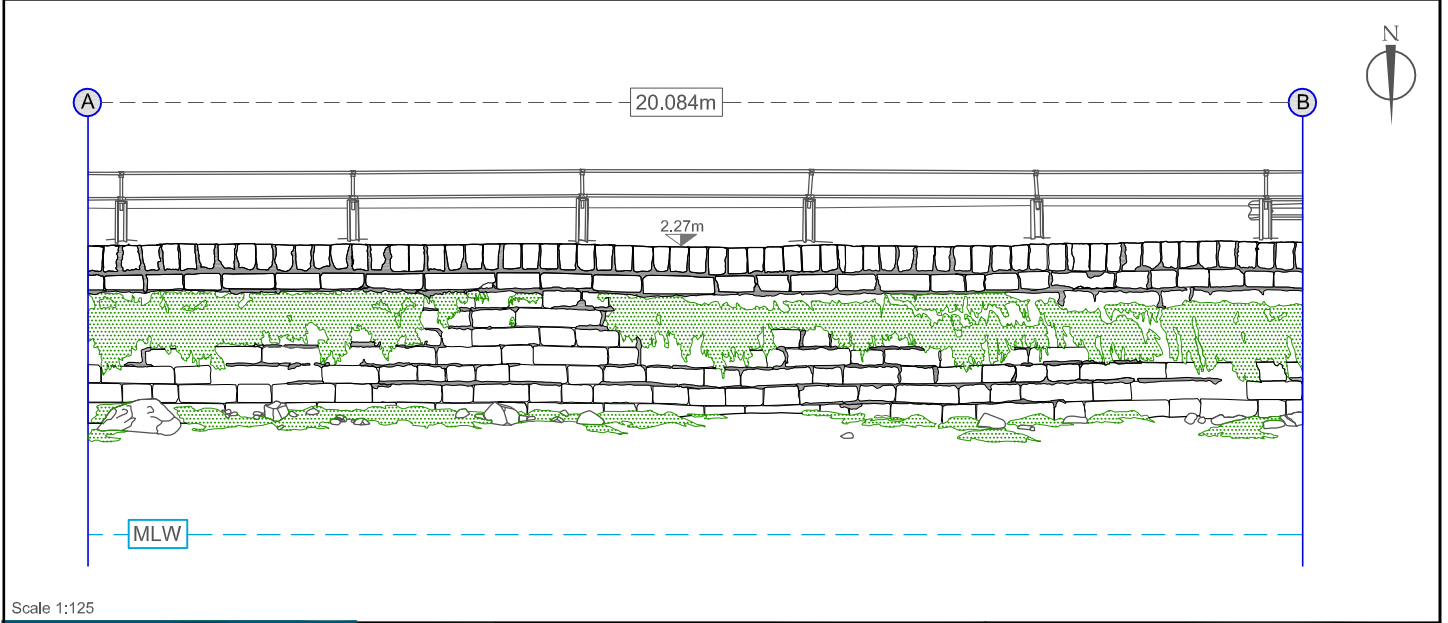
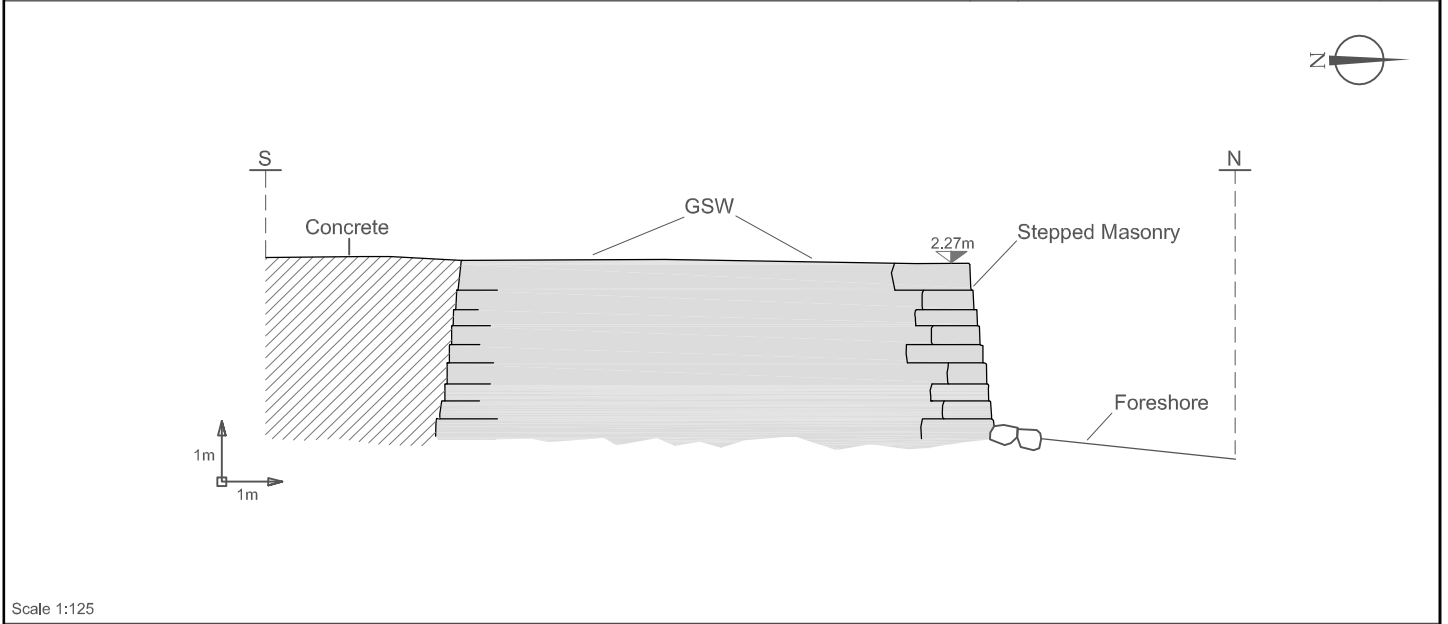
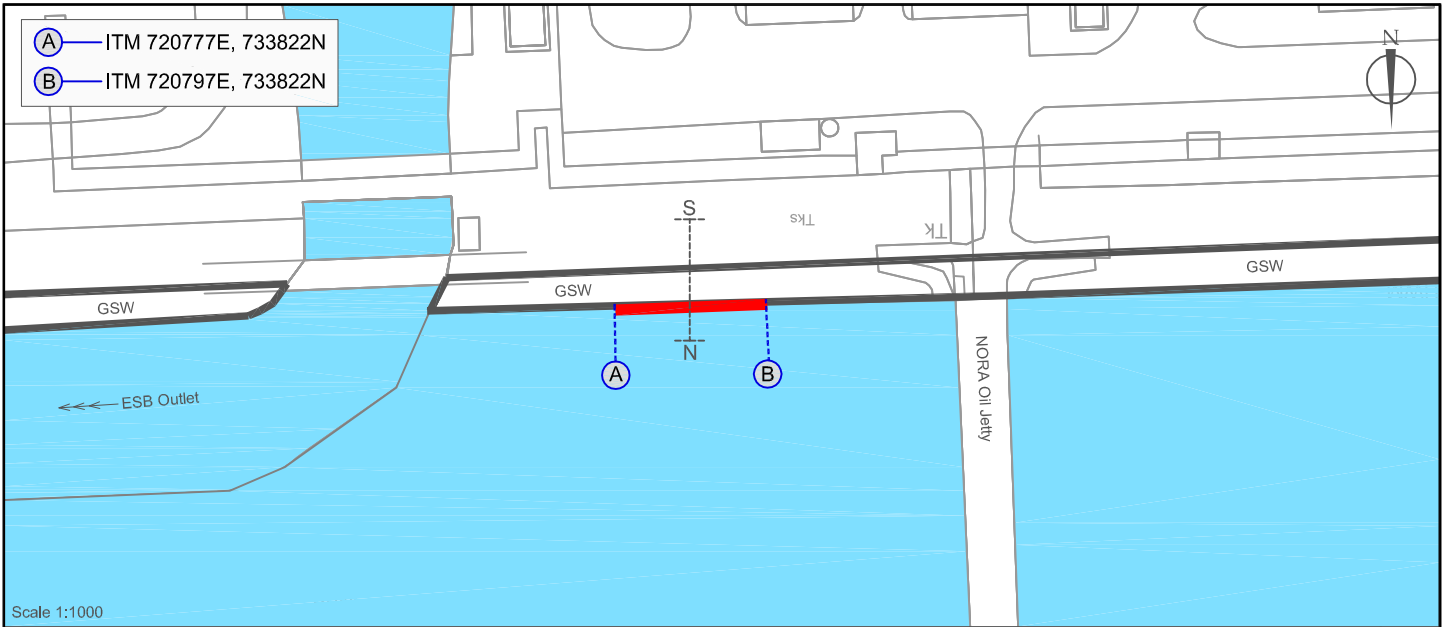
- Navigation Buoy, North side of channel
- Navigation Buoy, South side of channel

Feature F01 [HCS N32]- North Wall Quay Extension [Berth 18]
 Feature F02 [HCS N79]- Historic Quay Wall [Pigeon House Harbour]
 Feature F03 [HCS N79]- Historic Quay Wall [Pigeon House Harbour]
 Great South Wall [HCS N79]- Exposed sections [ESB Lands]

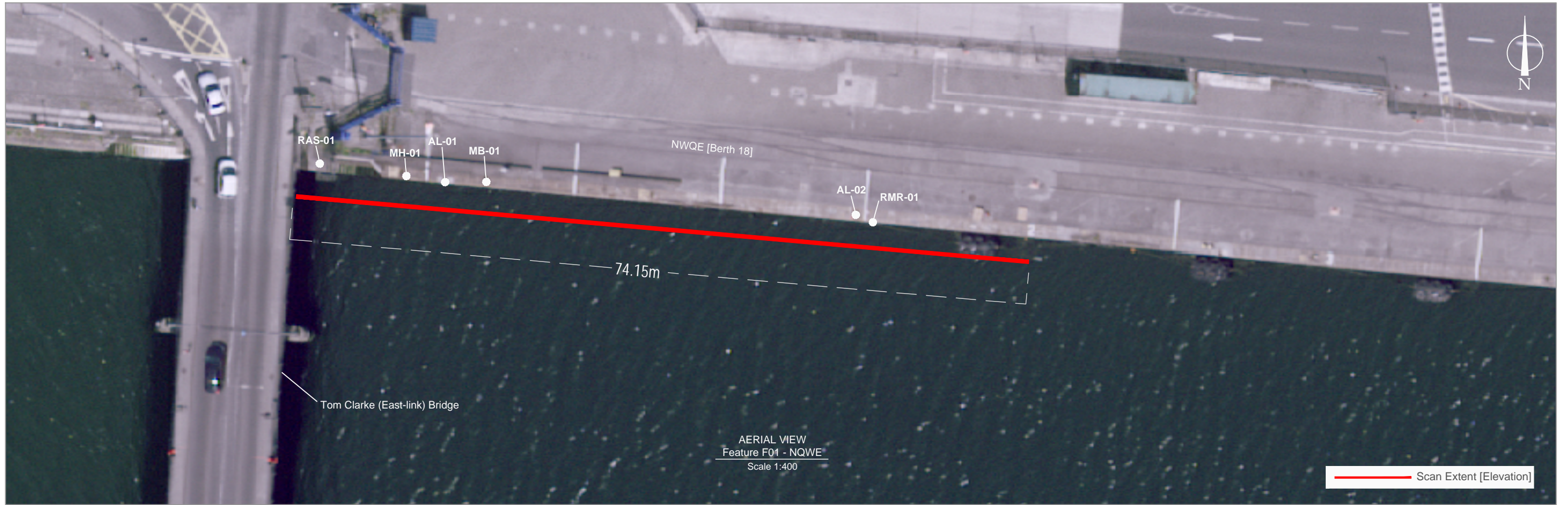
Notes
 - ADCO U/w Survey undertaken 03-08.04.22
 - GSW extents based on ADCO walkover inspection,
 - ADCO Laser-scan Survey undertaken 07/05.04.23
 and 16-17.05.23.



| | | | | | |
|-----------|--|------------------------------------|----------------------------------|---|--|
| A4 | Job/Exc No. 23D0037, 23R0148 | Compiled by R. Bangenter | CAD reference 3FM_UAIA | Client RPS/ Dublin Port Company (DPC) | Title Figure 27- Extent of laser-scan survey within ADCO Survey Areas 1-4. [see Figures 28-45 for Laser-scans] |
| | Date 18.07.23 | Scale 1:15,000 | Drawing No. Figure 27 | Project Dublin Port, 3FM Project | |



| | | | | | | | |
|--|---|------------------------------------|----------------------------------|--|-------------------------|-------------------------------|---------------------------------|
| | Notes - ADCO Laser-scan Survey undertaken 07/09.04.23 and 16-17.05.23. - All levels referenced to Malin Head OD. | | | Title Figure 28- Sample Cross-section and Elevation, Great South Wall, Area 4 (GSW-W3); ITM 720787E, 733822N (centrepoint). [see Figures 43-44 for laserscan imagery of area] | | | |
| | Client RPS/ Dublin Port Company (DPC) | A4 | | | Date 10.10.23 | Scale 1:1000/ 1:125 | Drawing No. Figure 28 |
| Project Dublin Port, 3FM Project | Job/Exc No. 23D0037, 23R0148 | Compiled by R.Bangertner | CAD reference 3FM_UAIA | | | | |



Notes
Survey Performed using RTK GNSS, Scanning Total Station and handheld Laser Scanner [Not to be used for engineering measurements].
Feature 1 corresponds to Site N32 in the Dublin Port Heritage Conservation Strategy. Aerial View-imagery supplied by RPS. [All levels to Malin Head O.D].

A3

Job/Exc No.
23D0037/ 23R0148

Produced by
D. Copeland

CAD reference
NWQE_Cloud

Client
RPS/ Dublin Port Company (DPC)

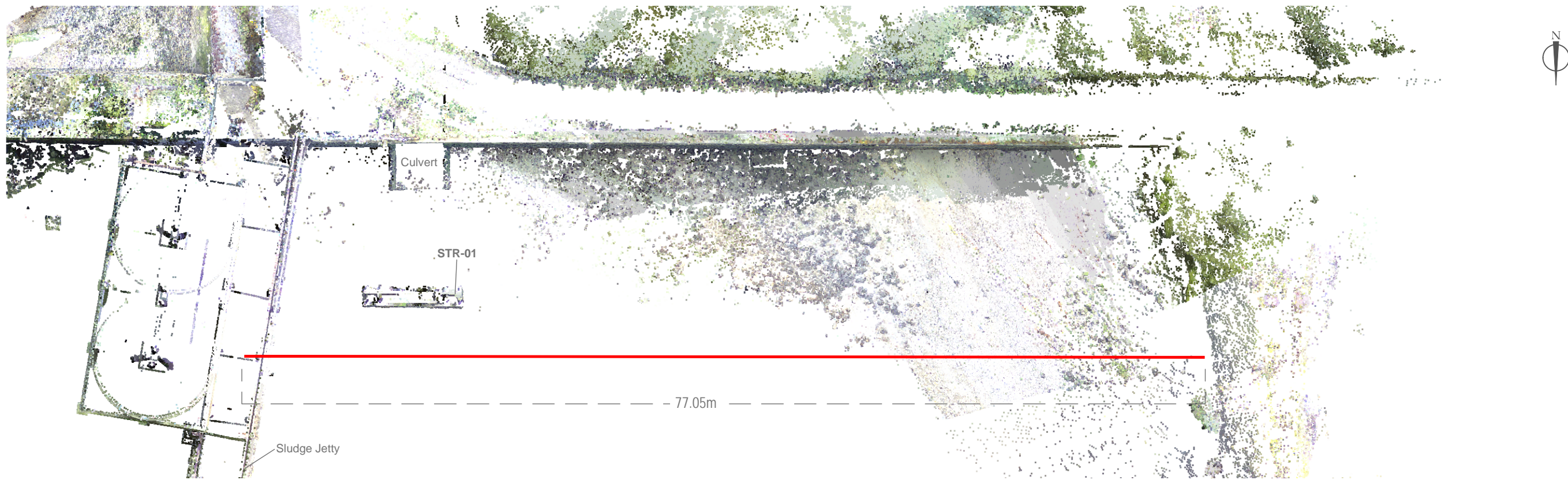
Title
Figure 29 - Point Cloud Elevation, Feature F01,
North Wall Quay Extension, Berth 18, ADCO Survey Area 1.

Date
26.09.23

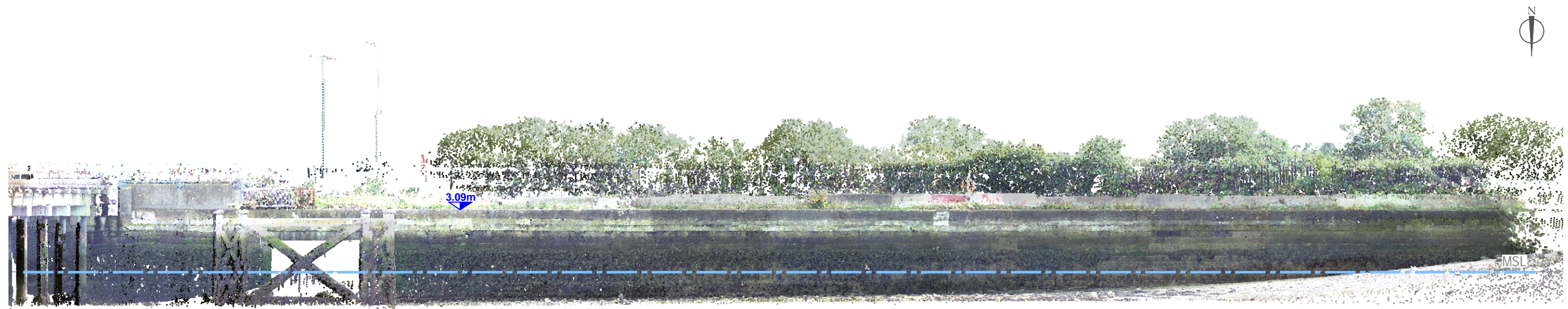
Scale
As shown

Drawing No.
Figure 29

Project
Dublin Port, 3FM Project



— Scan Extent [Elevation]
 PLAN
 Feature F02 - West
 Scale 1:300



ELEVATION
 Feature F02 - West Section
 Scale 1:200



Notes
 Survey Performed using RTK GNSS, Scanning Total Station and handheld Laser Scanner [Not to be used for engineering measurements].
 [All levels to Malin Head O.D.]

A3

Job/Exc No.
 23D0037, 23R0148

Date
 26.09.23

Produced by
 D. Copeland

Scale
 As shown

CAD reference
 GSW_Cloud

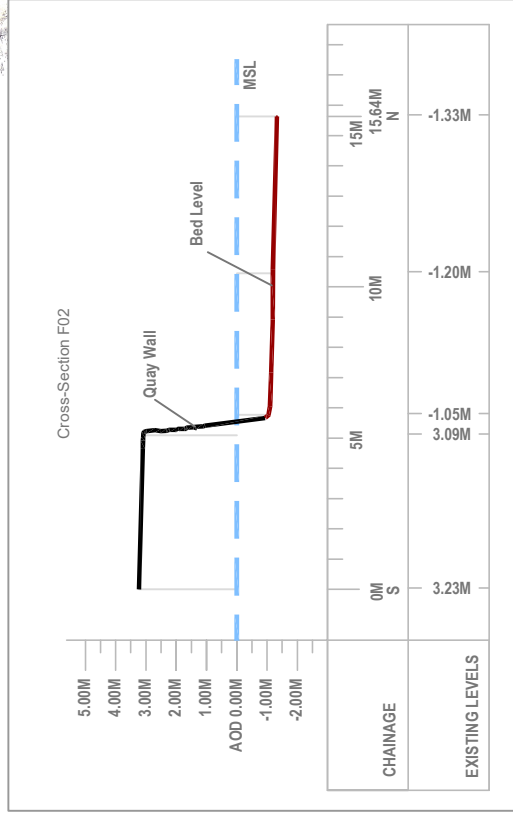
Drawing No.
 Figure 30

Client
 RPS/ Dublin Port Company (DPC)

Project
 Dublin Port, 3FM Project

Title
 Figure 30 - Point Cloud Plan and Elevation, Feature F02, quay wall to west of Sludge Jetty, ADCO Survey Area 2. [See Figure 31 for Perspective View]

ORIGINAL SIZE - A3 50mm 20mm



PERSPECTIVE VIEW
Feature F02 - West Section
NTS

Notes
Survey Performed using RTK GNSS, Scanning Total Station and handheld Laser Scanner [Not to be used for engineering measurements].
[All levels to Malin Head O.D.]

A4

Job/Exc. No.
23D0037, 23R0148

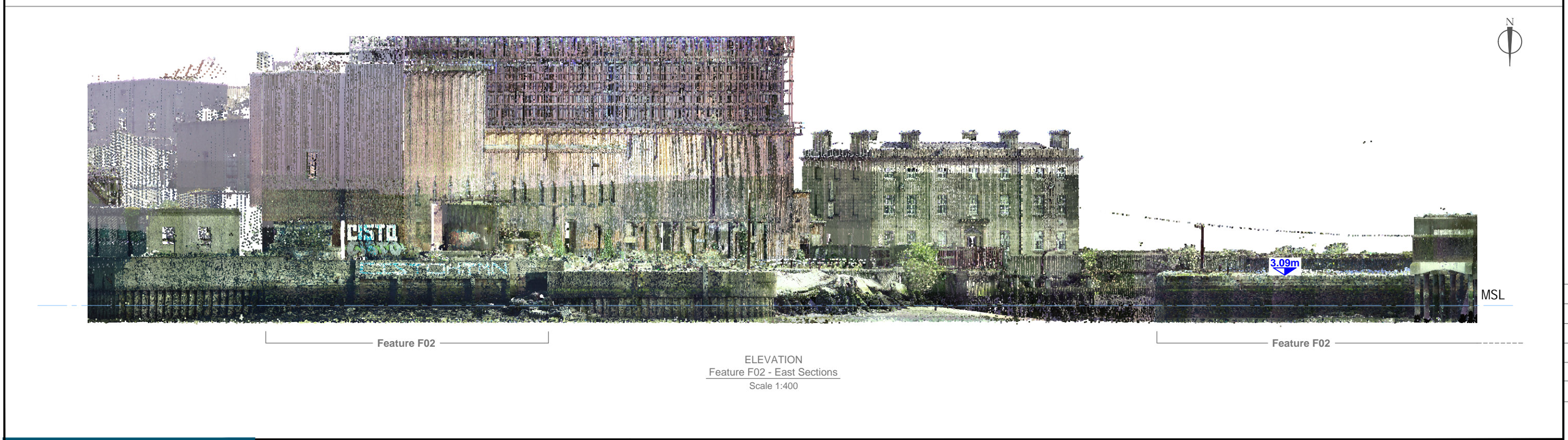
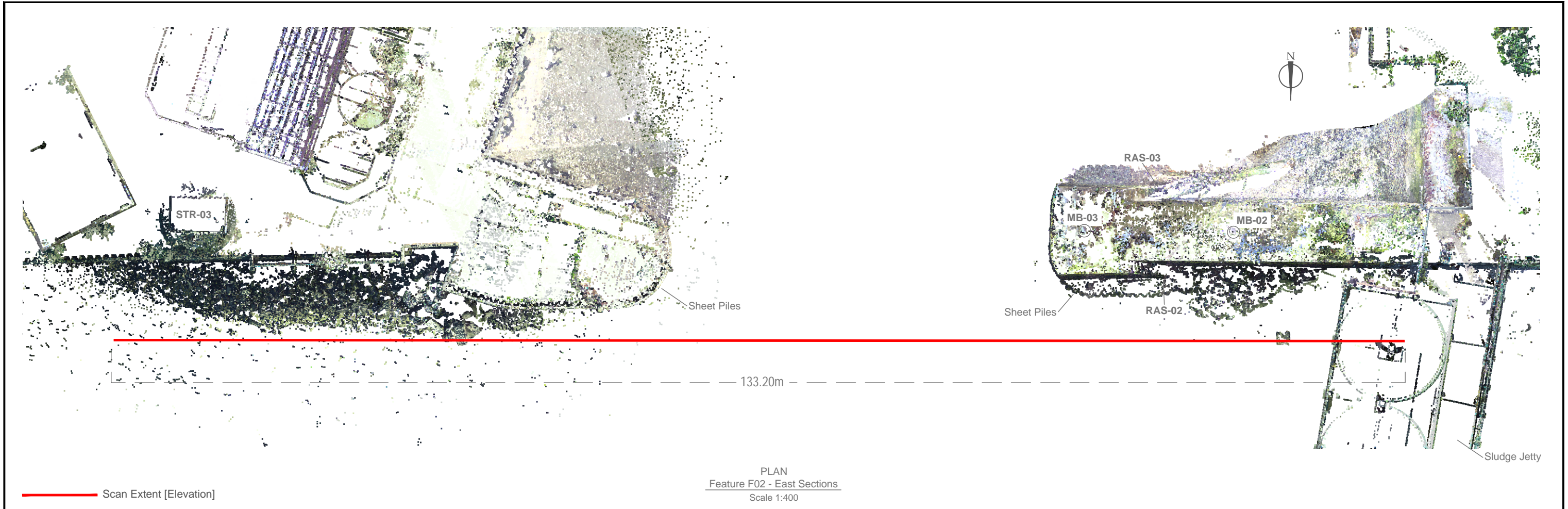
Produced by
D. Copeland

CAD reference
GSW_Cloud
Drawing No.
Figure 31

Client
RPS/Dublin Port Company (DPC)
Project
Dublin Port, 3FM Project

Title
Figure 31 - Point Cloud Perspective View,
Feature F02, quay wall to west of Sludge Jetty,
ADCO Survey Area 2.





Notes
Survey Performed using RTK GNSS, Scanning Total Station and handheld Laser Scanner [Not to be used for engineering measurements]. [All levels to Malin Head O.D.]

A3

Job/Exc No.
23D0037, 23R0148

Date
26.09.23

Produced by
D. Copeland

Scale
1:400

CAD reference
GSW_Cloud

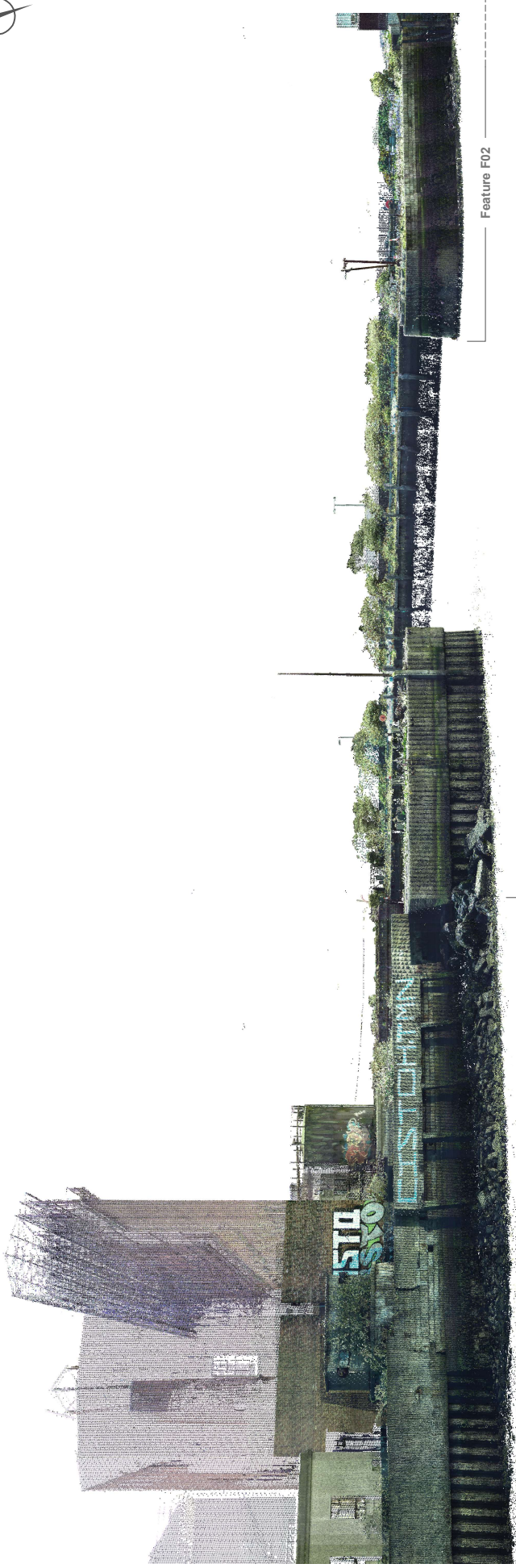
Drawing No.
Figure 32

Client
RPS/ Dublin Port Company (DPC)

Project
Dublin Port, 3FM Project

Title
Figure 32 - Point Cloud Plan and Elevation, Feature F02, sections of quay wall entrance to Pigeon House Harbour, ADCO Survey Area 2/4. [See Figure 33 for Perspective View]

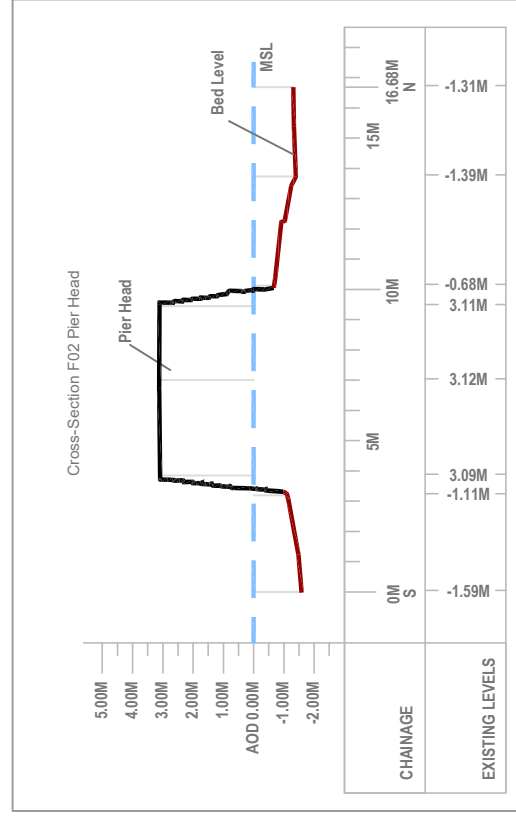
ORIGINAL SIZE - A3
20mm



Feature F02

PERSPECTIVE VIEW
Feature F02 - East Sections
NTS

Feature F02



Notes

Survey Performed using RTK GNSS, Scanning Total Station and handheld Laser Scanner [Not to be used for engineering measurements].
[All levels to Malin Head O.D.]

A4

Job/Exc. No.
23D0037, 23R0148

Date
26.09.23

Scale
NTS

Produced by
D. Copeland

CAD reference
GSW_Cloud

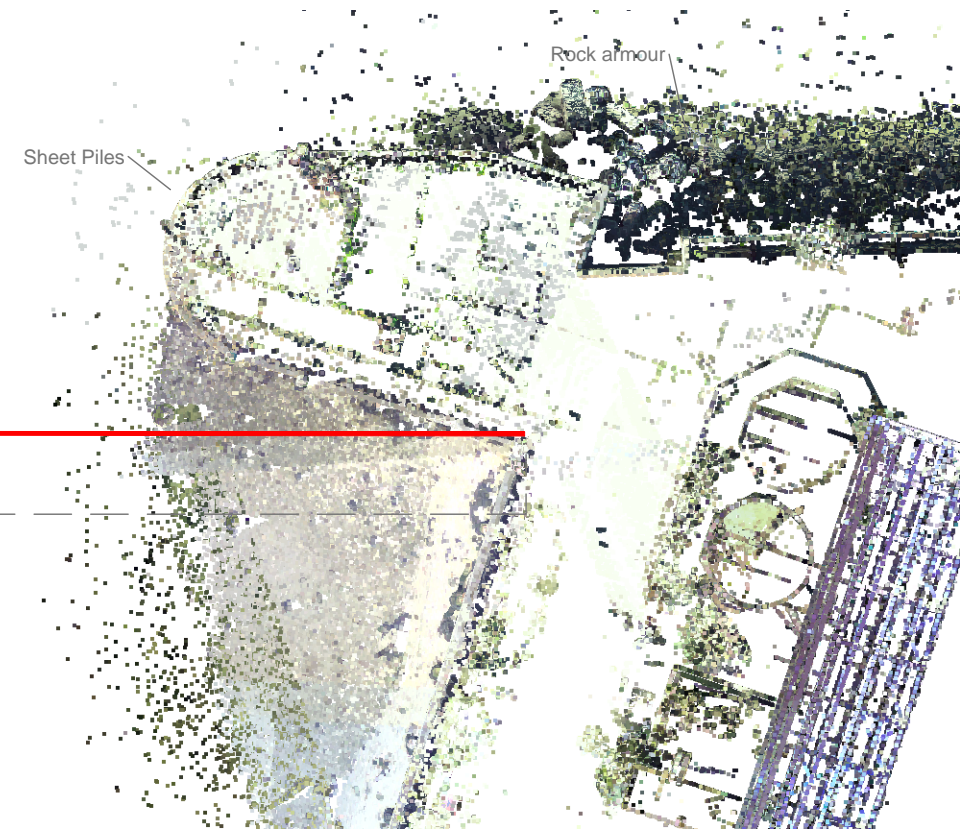
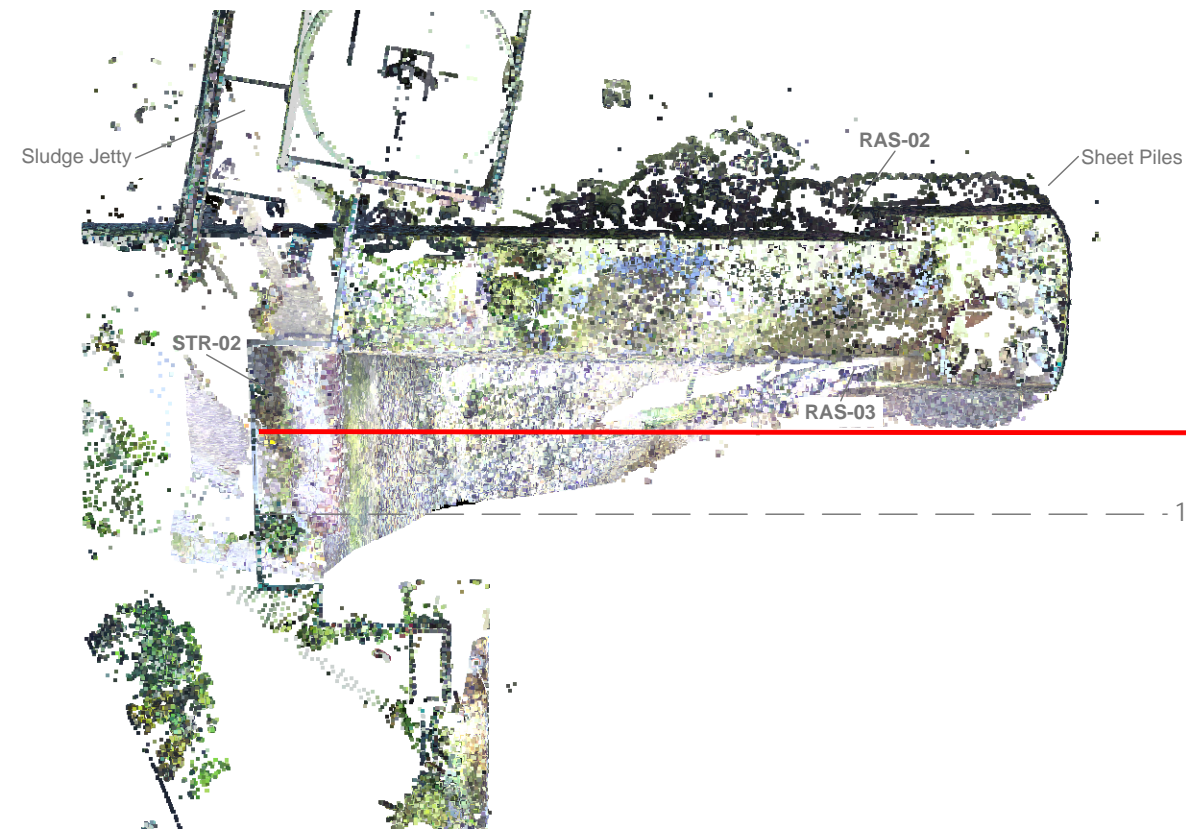
Client
RPS/Dublin Port Company (DPC)

Project
Dublin Port, 3FM Project

Title

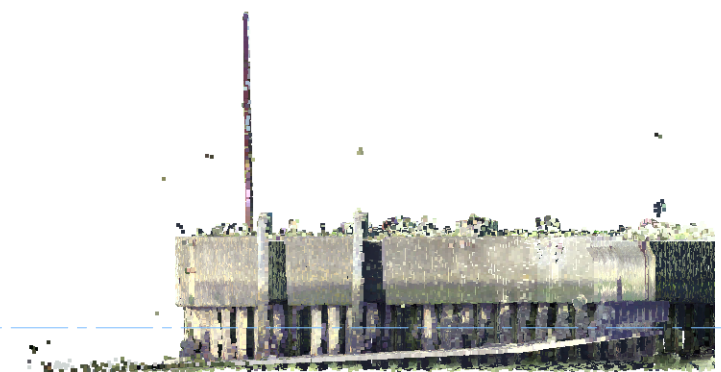
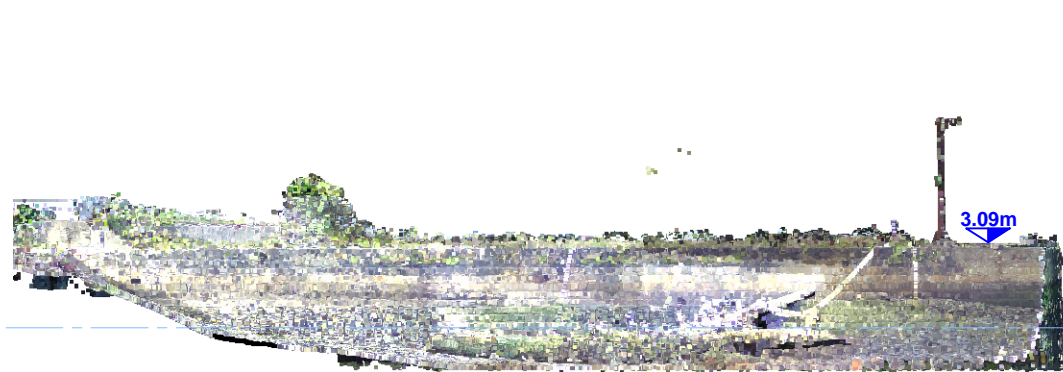
Figure 33 - Point Cloud Perspective View, Feature F02, sections of quay wall at entrance to Pigeon House Harbour, ADCO Survey Areas 2/4.





PLAN
Feature F02 - Internal
Scale 1:400

— Scan Extent [Elevation]



ELEVATION
Feature F02 - Internal Section
Scale 1:300



Notes
Survey Performed using RTK GNSS, Scanning Total Station and handheld Laser Scanner [Not to be used for engineering measurements].
[All levels to Malin Head O.D.]

A3

Job/Exc No.
23D0037, 23R0148

Produced by
D. Copeland

CAD reference
GSW_Cloud

Client
RPS/ Dublin Port Company (DPC)

Title
Figure 34 - Point Cloud Plan and Elevation, Feature F02, Quay Wall at entrance to Pigeon House Harbour, ADCO Survey Area 3. [See Figure 35 for Perspective View]

Date
26.09.23

Scale
As shown

Drawing No.
Figure 34

Project
Dublin Port, 3FM Project

ORIGINAL SIZE - A3
50mm
20mm



PERSPECTIVE VIEW
 Feature F02 – Internal Section
 NTS



Notes
 Survey Performed using RTK GNSS, Scanning Total Station and
 handheld Laser Scanner [Not to be used for engineering measurements].
 [All levels to Malin Head O.D.]

A4

Job/Exc. No.
 23D0037, 23R0148

Date
 26.09.23

Scale
 NTS

Produced by
 D. Copeland

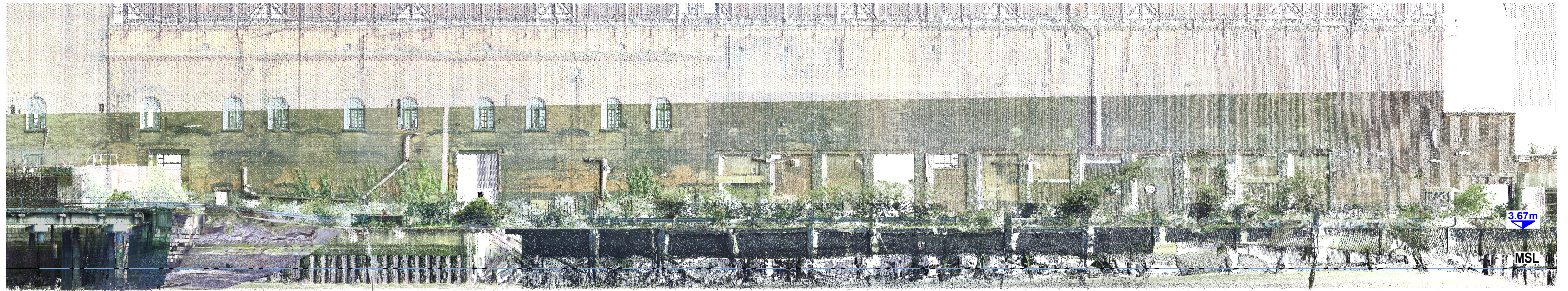
CAD reference
 GSW_Cloud

Drawing No.
 Figure 35

Client
 RPS/Dublin Port Company (DPC)

Project
 Dublin Port, 3FM Project

Title
 Figure 35 - Point Cloud Perspective View,
 Feature F02, Quay Wall at entrance 3 to Pigeon
 House Harbour, ADCO Survey Area 3.



ELEVATION
Feature F03 - East Section
Scale 1:300

Sheet Piles

Feature F03
[quay wall located behind collapse]



PERSPECTIVE VIEW
Feature F03 - East Section
NTS



Notes
Survey Performed using RTK GNSS, Scanning Total Station and handheld Laser Scanner (Not to be used for engineering measurements).
[All levels to Malin Head O.D.]

A3

Job/Exc No.
23D0037, 23R0148

Produced by
D. Copeland

CAD reference
GSW_Cloud

Client
RPS/ Dublin Port Company (DPC)

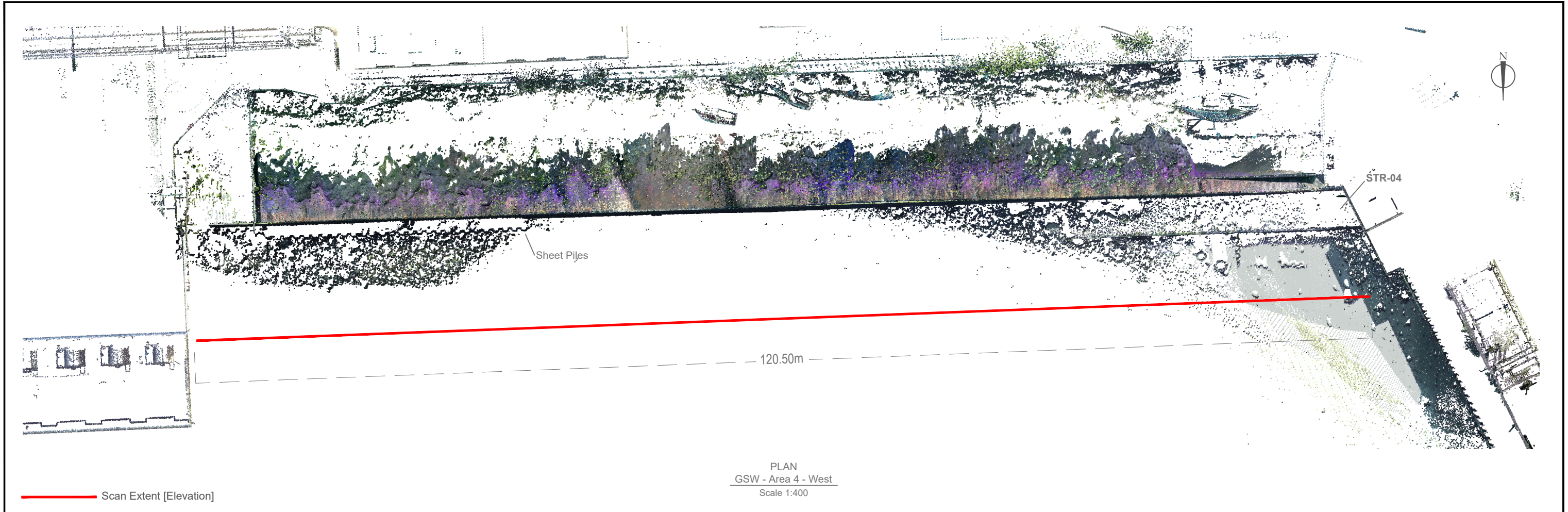
Title
Figure 36 - Point Cloud Elevation and Perspective View, Feature F03, Quay Wall on east side of Pigeon House Harbour, ADCO Survey Area 3.

Date
26.09.23

Scale
As shown

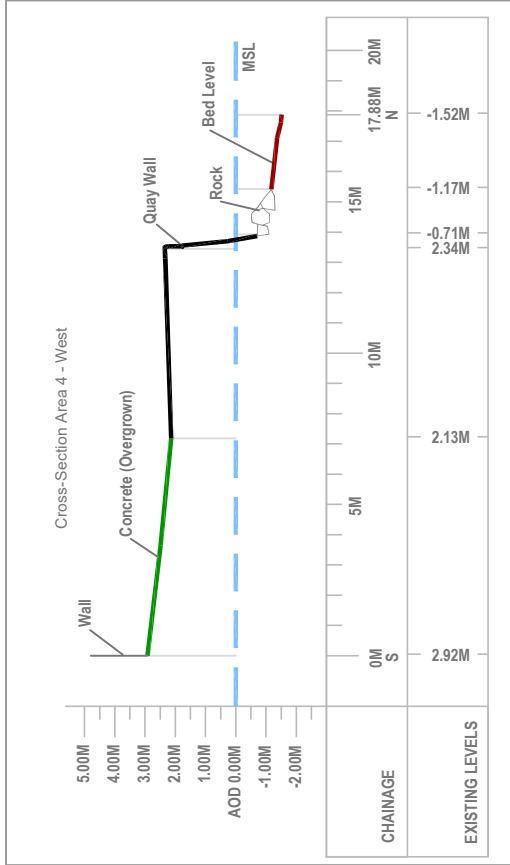
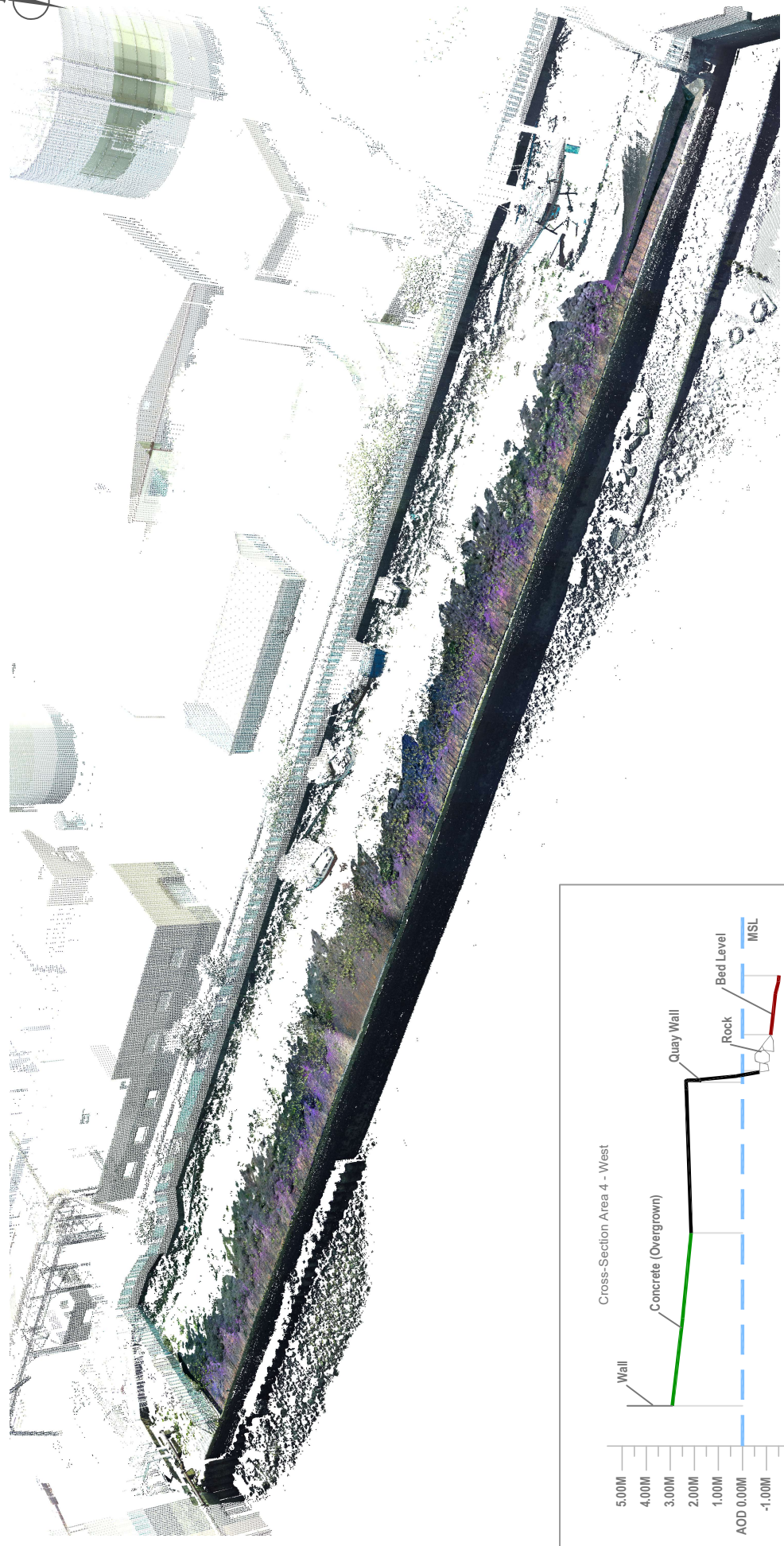
Drawing No.
Figure 36

Project
Dublin Port, 3FM Project



| | | | | | | | |
|--|--|-------------------------|--|-----------------------------------|--|---|--|
| | Notes Survey Performed using RTK GNSS, Scanning Total Station and handheld Laser Scanner [Not to be used for engineering measurements]. GSW corresponds to Site N79 in the Dublin Port Heritage Conservation Strategy. [All levels to Malin Head O.D.] | A3 | Job/Exc No. 23D0037, 23R0148 | Produced by D. Copeland | CAD reference GSW_Cloud | Client RPS/ Dublin Port Company (DPC) | Title Figure 37 - Point Cloud Plan and Elevation, Great South Wall, ADCO Survey Area 4 [West]. [See Figure 38 for Perspective View] |
| | | Date 26.09.23 | Scale As shown | Drawing No. Figure 37 | Project Dublin Port, 3FM Project | | |

ORIGINAL SIZE - A3
20mm



PERSPECTIVE VIEW
GSW - Area 4 - West
NTS



Notes
Survey Performed using RTK GNSS, Scanning Total Station and handheld Laser Scanner. [Not to be used for engineering measurements]. GSW corresponds to Site N79 in the Dublin Port Heritage Conservation Strategy. [All levels to Malin Head O.D.]

Job/Exc No.
23D0037, 23R0148

Date
26.09.23

Produced by
DC

Scale
NTS

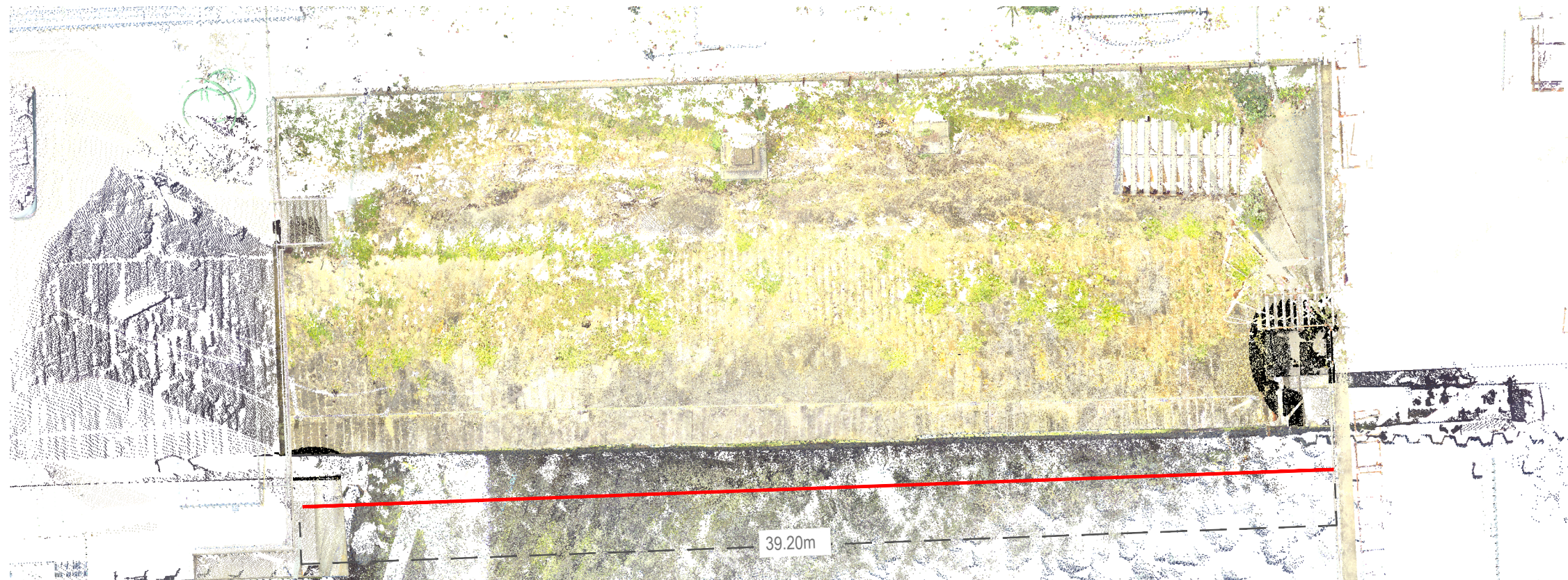
CAD reference
GSW_Cloud

Drawing No.
Figure 38

Client
RPS/Dublin Port Company (DPC)

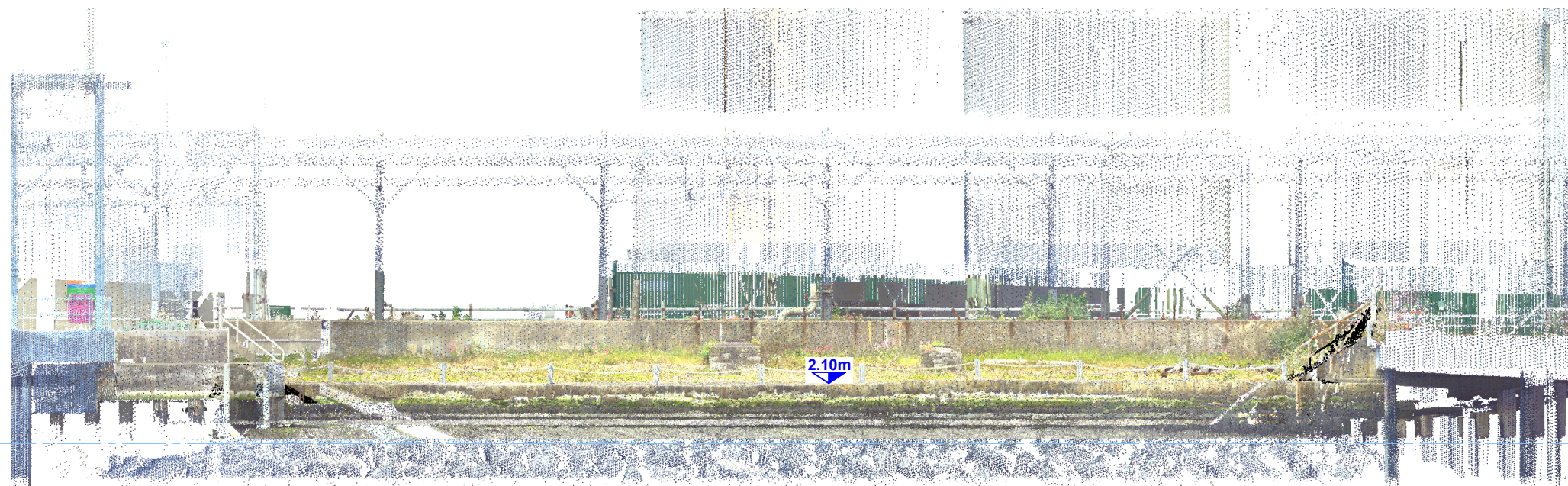
Project
Dublin Port, 3FM Project

Title
Figure 38 - Point Cloud Perspective View, Great South Wall, ADCO Survey Area 4 [West].



PLAN
 GSW - Area 4 - West 1
 Scale 1:200

— Scan Extent [Elevation]



ELEVATION
 GSW - Area 4 - West 1
 Scale 1:200

MSL



Notes
 Survey Performed using RTK GNSS, Scanning Total Station and handheld Laser Scanner [Not to be used for engineering measurements]. GSW corresponds to Site N79 in the Dublin Port Heritage Conservation Strategy. [All levels to Malin Head O.D.]

A3

Job/Exc No.
 23D0037, 23R0148

Produced by
 D. Copeland

CAD reference
 GSW_Cloud

Client
 RPS/ Dublin Port Company (DPC)

Title
 Figure 39 - Point Cloud Plan and Elevation, Great South Wall, ADCO Survey Area 4 [West 1].
 [See Figure 40 for Perspective View]

Date
 26.09.23

Scale
 As shown

Drawing No.
 Figure 39

Project
 Dublin Port, 3FM Project

ORIGINAL SIZE - A3
 50mm
 20mm



PERSPECTIVE VIEW
 GSW - Area 4 - West 1
 NTS



Notes
 Survey Performed using RTK GNSS, Scanning Total Station and handheld Laser Scanner (Not to be used for engineering measurements). GSW corresponds to Site N79 in the Dublin Port Heritage Conservation Strategy. [All levels to Malin Head O.D].

A4

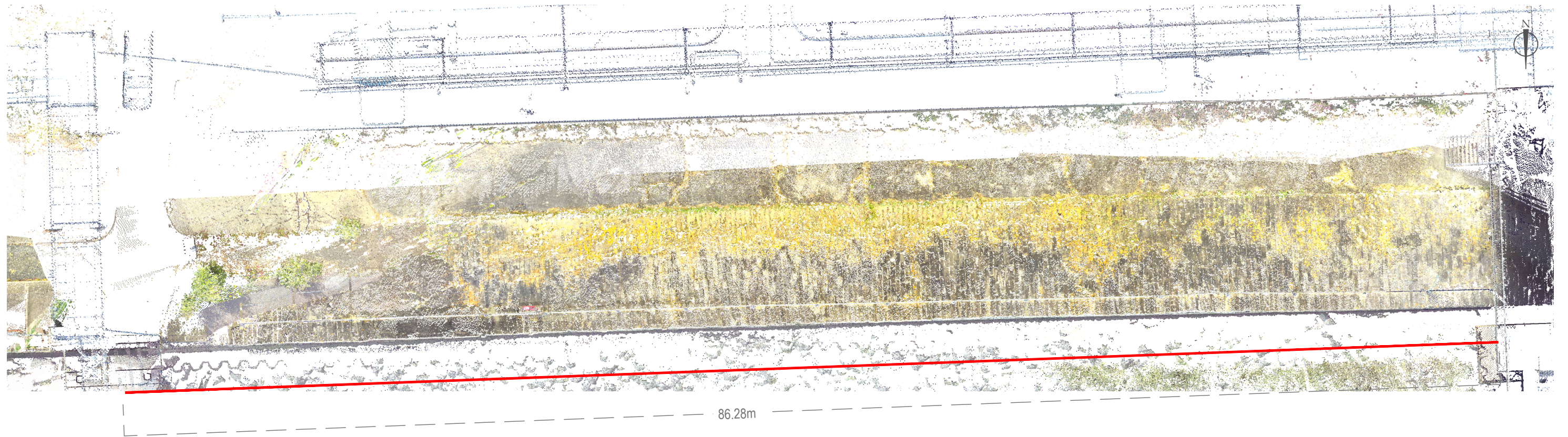
Job/Exc No.
 23D0037, 23R0148
Date
 26.09.23

Produced by
 D. Copeland
Scale
 NTS

CAD reference
 GSW_Cloud
Drawing No.
 Figure 40

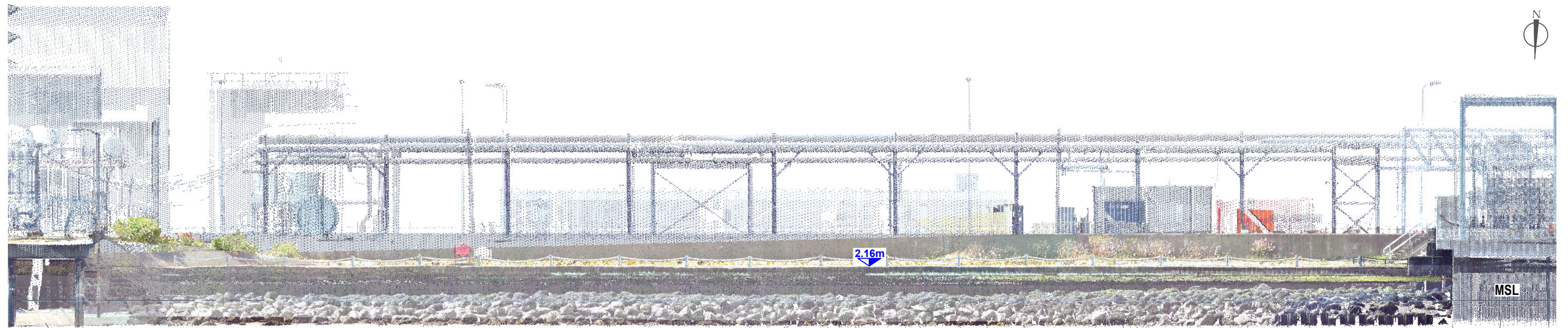
Client
 RPS/ Dublin Port Company (DPC)
Project
 Dublin Port, 3FM Project

Title
 Figure 40 - Point Cloud Perspective View, Great South Wall, ADCO Survey Area 4 [West 1]



— Scan Extent [Elevation]

PLAN
GSW - Area 4 - West 2
Scale 1:250



Oil Jetty

ELEVATION
GSW - Area 4 - West 2
Scale 1:250

ESB Structure



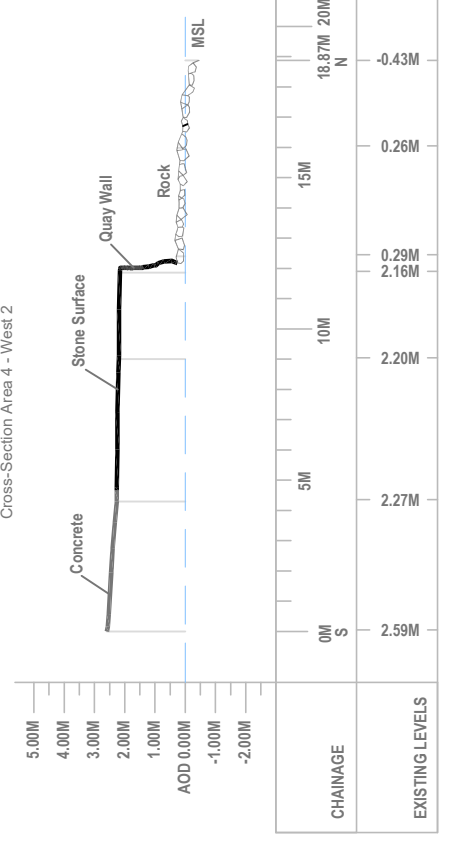
Notes
Survey Performed using RTK GNSS, Scanning Total Station and handheld Laser Scanner [Not to be used for engineering measurements]. GSW corresponds to Site N79 in the Dublin Port Heritage Conservation Strategy. [All levels to Malin Head O.D.]

| | | | | | |
|----|--|-----------------------------------|-----------------------------------|---|---|
| A3 | Job/Exc No. 23D0037, 23R0148 | Produced by D. Copeland | CAD reference GSW_Cloud | Client RPS/ Dublin Port Company (DPC) | Title Figure 41 - Point Cloud Plan and Elevation, Great South Wall, ADCO Survey Area 4 [West 2]. [See Figure 42 for Perspective View] |
| | Date 26.09.23 | Scale As shown | Drawing No. Figure 41 | Project Dublin Port, 3FM Project | |

ORIGINAL SIZE - A3
50mm
20mm



Cross-Section Area 4 - West 2



PERSPECTIVE VIEW
GSW - Area 4 - West 2
NTS



Notes
Survey Performed using RTK GNSS, Scanning Total Station and hand held Laser Scanner (Not to be used for engineering measurements). GSW corresponds to Site N79 in the Dublin Port Heritage Conservation Strategy. [All levels to Mean Head O.D.]

Job/Exc No.
23D0037, 23R0148

Date
26.09.23

Produced by
D. Copeland

Scale
NTS

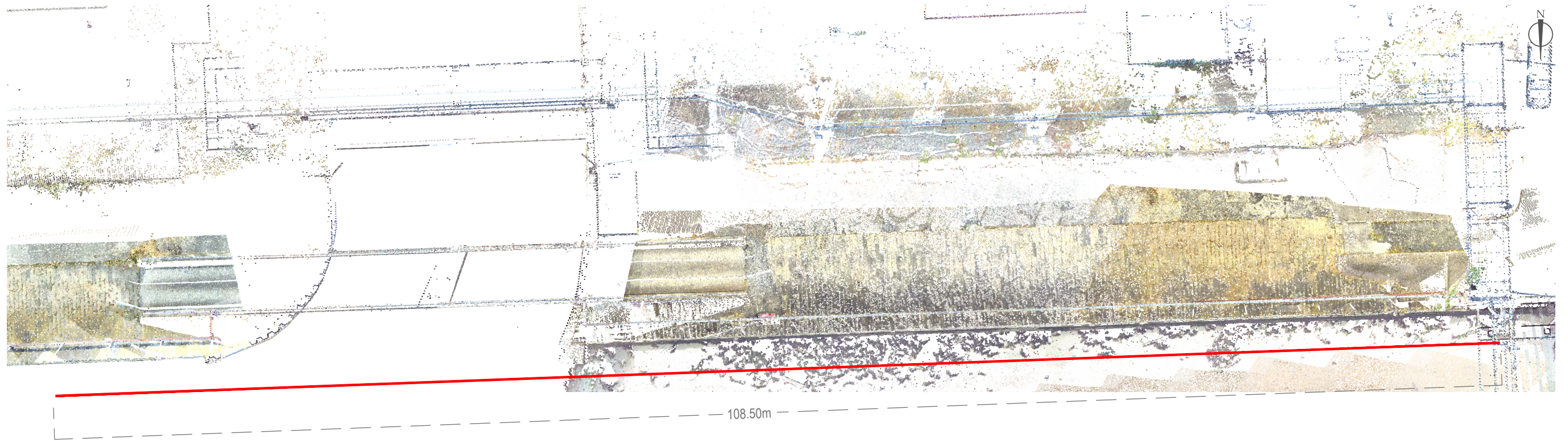
CAD reference
GSW_Cloud

Drawing No.
Figure 42

Client
RPS/ Dublin Port Company (DPC)

Project
Dublin Port, 3FM Project

Title
Figure 42 - Point Cloud Perspective View, Great South Wall, ADCO Survey Area 4 [West 2]



PLAN
 GSW - Area 4 - West 3
 Scale 1:300

— Scan Extent [Elevation]



ELEVATION
 GSW - Area 4 - West 3
 Scale 1:300

Sheet Pile Wall to ESB Outlet

Oil Jetty

MSL



Notes
 Survey Performed using RTK GNSS, Scanning Total Station and handheld Laser Scanner [Not to be used for engineering measurements]. GSW corresponds to Site N79 in the Dublin Port Heritage Conservation Strategy. [All levels to Malin Head O.D.]

A3

Job/Exc No.
 23D0037, 23R0148

Produced by
 D. Copeland

CAD reference
 GSW_Cloud

Client
 RPS/ Dublin Port Company (DPC)

Title
 Figure 43 - Point Cloud Plan and Elevation, Great South Wall, ADCO Survey Area 4 [West 3]. [See Figure 44 for Perspective View]

Date
 26.09.23

Scale
 As shown

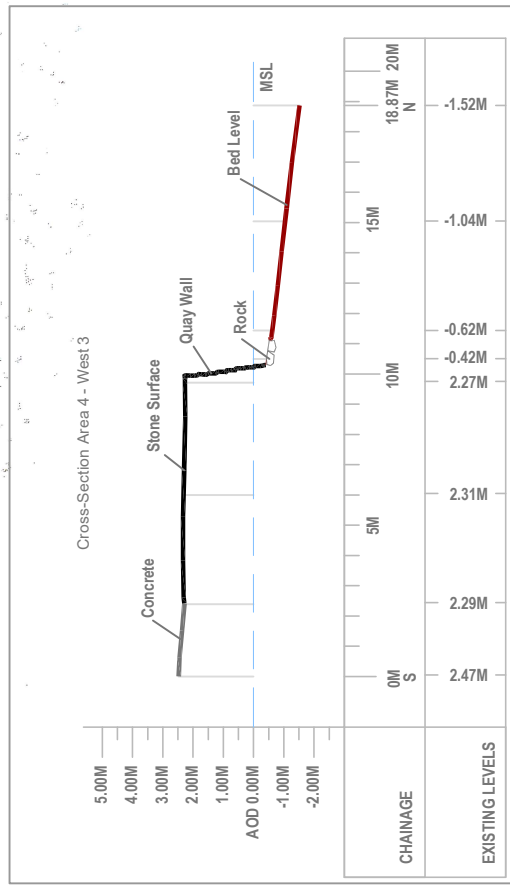
Drawing No.
 Figure 43

Project
 Dublin Port, 3FM Project

ORIGINAL SIZE - A3
 50mm
 20mm



PERSPECTIVE VIEW
GSW - Area 4 - West 3
NTS



Notes
Survey Performed using RTK GNSS, Scanning Total Station and handheld Laser Scanner (Not to be used for engineering measurements). GSW corresponds to Site N79 in the Dublin Port Heritage Conservation Strategy. [All levels to Mean Head O.D].

Job/Exc No.
23D0037, 23R0148

Date
26.09.23

Produced by
D. Copeland

Scale
NTS

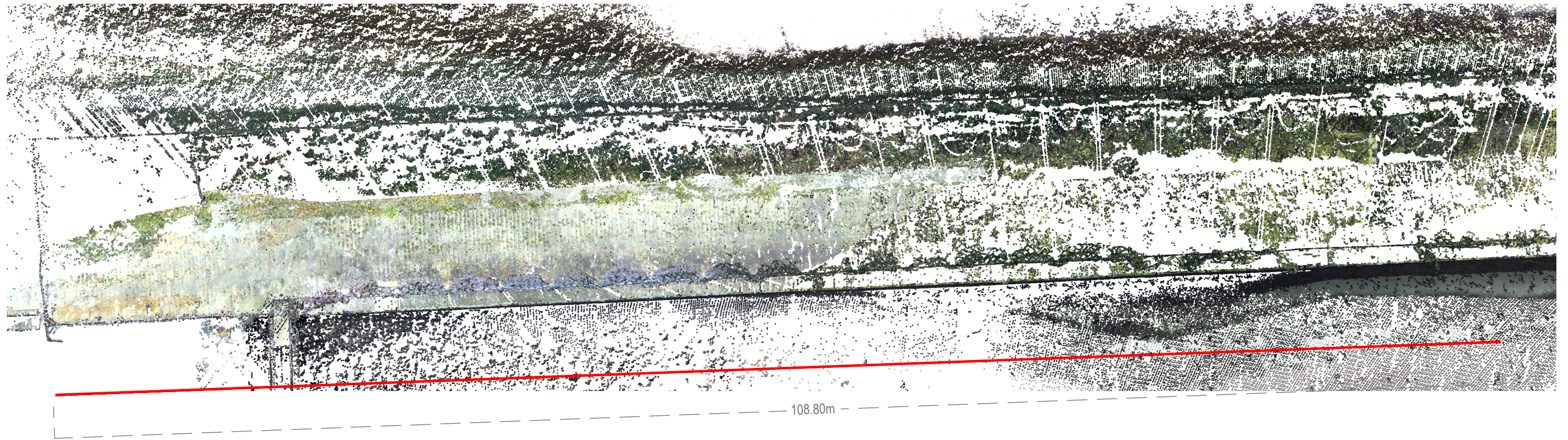
CAD reference
GSW_Cloud

Drawing No.
Figure 44

Client
RPS/ Dublin Port Company (DPC)

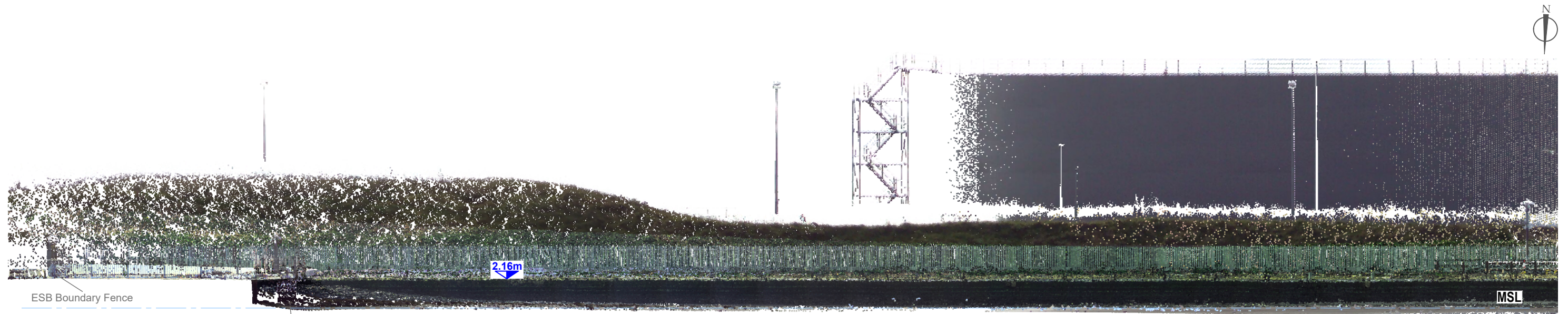
Project
Dublin Port, 3FM Project

Title
Figure 44 - Point Cloud Perspective View, Great South Wall, ADCO Survey Area 4 [West 3]



PLAN
 GSW - Area 4 - East
 Scale 1:300

— Scan Extent [Elevation]



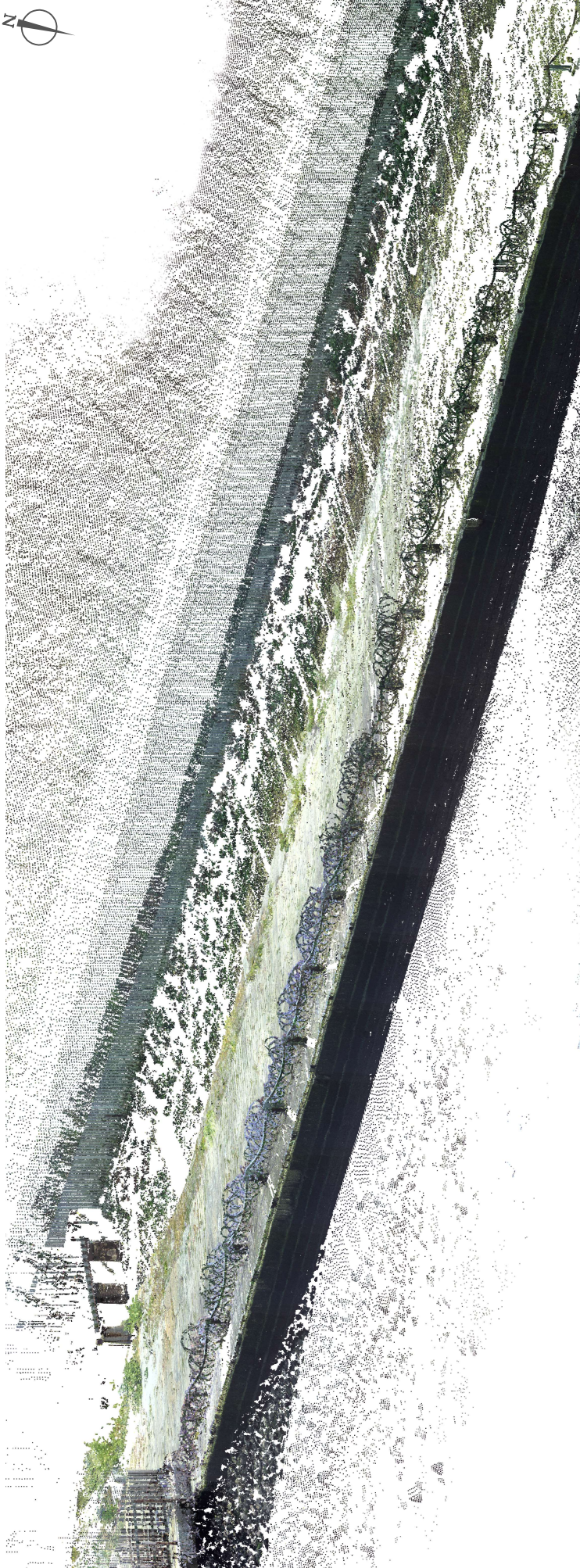
ELEVATION
 GSW - Area 4 - East
 Scale 1:300



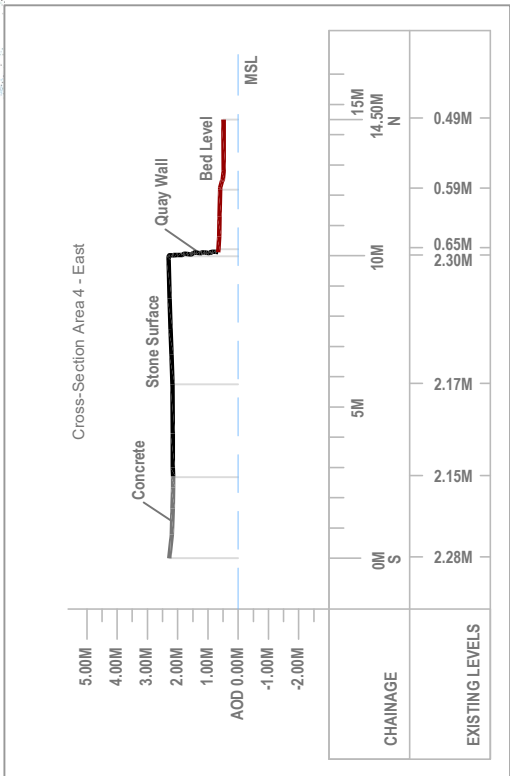
Notes
 Survey Performed using RTK GNSS, Scanning Total Station and handheld Laser Scanner [Not to be used for engineering measurements]. GSW corresponds to Site N79 in the Dublin Port Heritage Conservation Strategy. [All levels to Malin Head O.D.]

| | | | | | |
|----|--|-----------------------------------|-----------------------------------|---|---|
| A3 | Job/Exc No. 23D0037, 23R0148 | Produced by D. Copeland | CAD reference GSW_Cloud | Client RPS/ Dublin Port Company (DPC) | Title Figure 45 - Point Cloud Plan and Elevation, Great South Wall, ADCO Survey Area 4 [East]. [See Figure 46 for Perspective View] |
| | Date 26.09.23 | Scale As shown | Drawing No. Figure 45 | Project Dublin Port, 3FM Project | |

ORIGINAL SIZE - A3
50mm
20mm



PERSPECTIVE VIEW
GSW - Area 4 - East
NTS



| | | | | | | |
|---|-------------------------|--|-----------------------------------|--|---|--|
| Notes Survey Performed using RTK GNSS, Scanning Total Station and handheld Laser Scanner (Not to be used for engineering measurements). GSW corresponds to Site N79 in the Dublin Port Heritage Conservation Strategy. [All levels to Mean Head O.D.] | A4 | Job/Exc No. 23D0037, 23R0148 | Produced by D. Copeland | CAD reference GSW_Cloud | Client RPS/ Dublin Port Company (DPC) | Title Figure 46 - Point Cloud Perspective View, Great South Wall, ADCO Survey Area 4 [East]. |
| | Date 26.09.23 | Scale NTS | Drawing No. Figure 46 | Project Dublin Port, 3FM Project | | |





Plate 1: Detail from Rocque's map of 1756, indicating degree of maritime activity alongside the city's quays [source: bilibotecdigitalhispanica.bne.es].

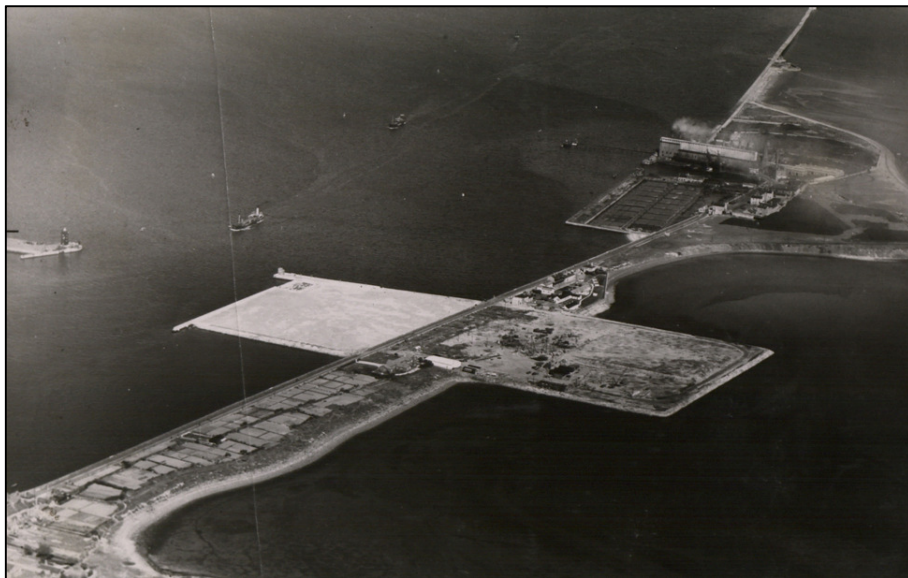


Plate 2: East-northeast facing aerial view of Dublin Port, showing development of port facilities on the south side of the River Liffey in the 1970s [source: Dublin Port Archive].



Plate 3: South-facing view of the construction of the East-link Bridge (1983-84) showing reclamation of the foreshore on the south side of the channel [source: Bridges of Dublin, DCC].

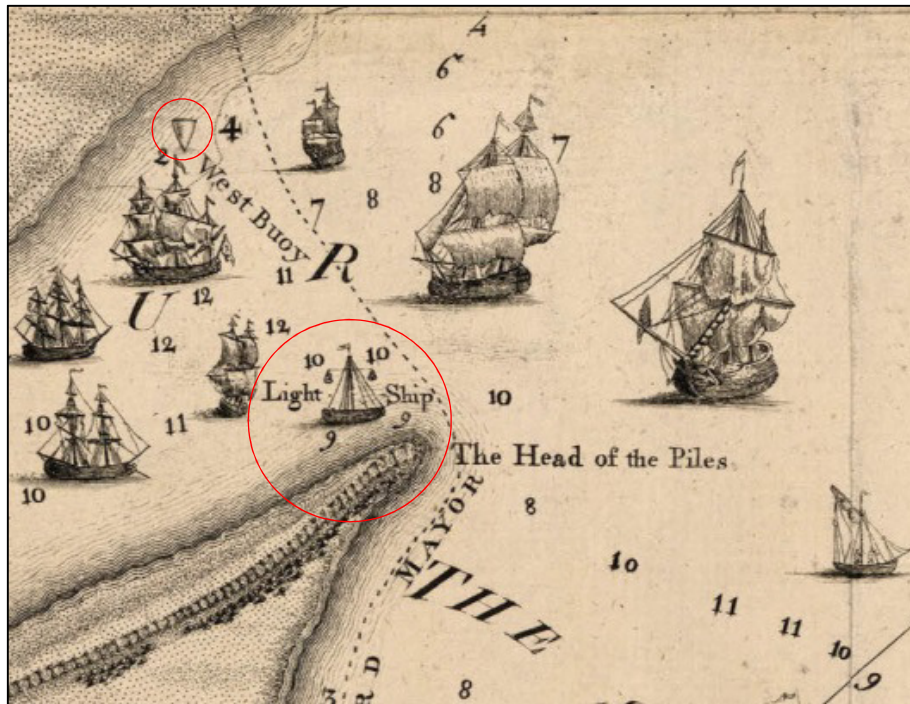


Plate 4: Detail from Rocque's map of 1757, showing the entrance to the navigation channel, demarcated by the 'West Buoy' to west, and a 'Light Ship' 'The Head of the Piles' to the east [source: bibliotecdigitalhispanica.bne.es].

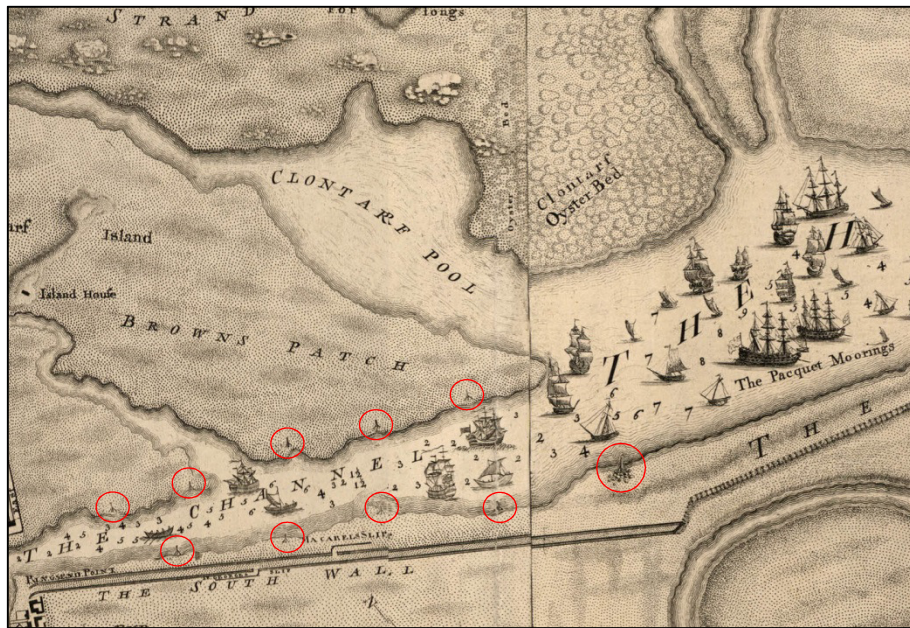


Plate 5: Detail from Rocque's map of 1757 depicting a series of timber frame navigation marks running along the LWM on either side of the channel [source: bilibotecdigitalhispanica.bne.es].



Plate 6: Nineteenth-century view of the terminus of North Wall Quay and lighthouse, looking from the south [source: *The Dublin Penny Journal*, 1834].

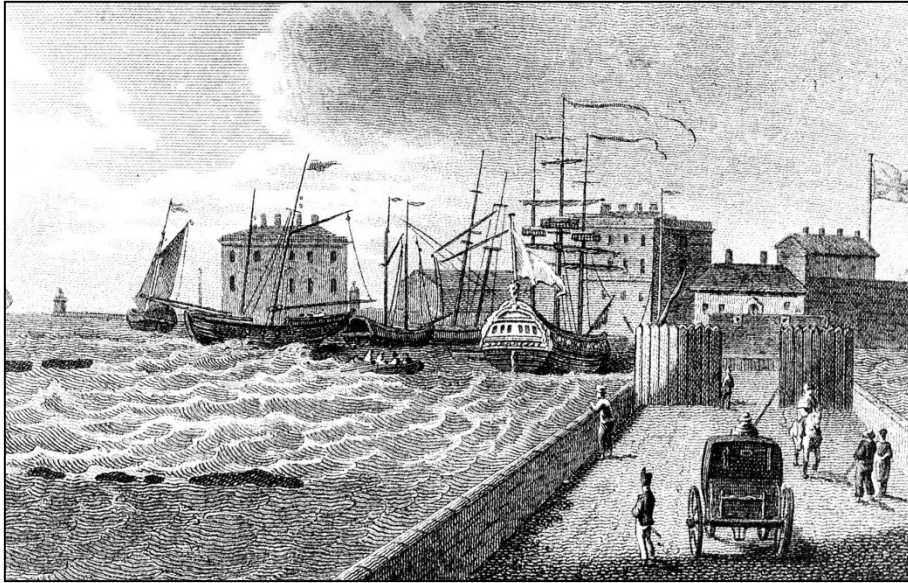


Plate 7: Engraving showing western approach to Pigeon House Fort, c. 1824
[Source: *Patrick Healy Collection*, South Dublin Libraries, Local Studies Collection].



Plate 8: Dublin Port, oblique aerial photograph taken from west, 1933
[source: Britain from Above].



Plate 9: West-facing view along the NWQE (photograph taken 1905) showing crane-and-rail infrastructure and adjacent goods sheds [source: Dublin Port Archive].



Plate 10: Example shot of diver entering water to carry out underwater survey [location: northwest corner of Survey Area 4, west of Buoy Number 14].



Plate 11: Laser-scan survey in progress at entrance to Pigeon House Harbour; scanning from the east dolphin of the Sludge Jetty.



Plate 12: Boat-wreck (Shetland Motorboat), upstanding from riverbed at target location of SS_15; ITM 718416E, 734145N (1m scale).



Plate 13: East-facing view along rock-armour that delineates the foreshore on the south side of the River Liffey, within Survey Area 1 (1m scale).



Plate 14: East-facing view of intertidal foreshore on south side of the River Liffey, Survey Area 1; Poolbeg Marina in distance (1m scale).



Plate 15: West-facing view of intertidal foreshore on south side of the River Liffey, Survey Area 1; Tom Clarke Bridge in distance (1m scale).



Plate 16: Example shots of early twentieth-century ceramic fragments located within foreshore deposits on south side of the River Liffey, Survey Area 1 (150mm scale).



Plate 17: Example shots of nineteenth-/ early twentieth-century bottles present within foreshore deposits on south side of the River Liffey, Survey Area 1 (150mm scale).



Plate 18: Modern metallic debris, machinery-part reused as mooring, located towards the western limit of Survey Area 4.



Plate 19: Northwest-facing view of river access steps (RAS-01) located on downstream side of Tom Clarke Bridge (1m scale).



Plate 20: Detail shot showing eroded boat tie-off fitting from RAS-01 (150mm scale).



Plate 21: West-facing view of river access steps located immediately upstream of Tom Clarke Bridge.



Plate 22: Detail shot showing well-preserved boat tie-off fitting from upstream river access steps; these being inset into every second step (150mm scale).



Plate 23: West-facing view of bullnose terminus to cascading masonry on the west side of the upstream river access steps.



Plate 24: Early twentieth century photograph showing the use of floating caissons in the construction of new quaysides within Dublin Port [source: Dublin Port Archive].



Plate 25: East-northeast facing view along NWQE, Berth 18.



Plate 26: Northeast-facing view along NWQE, coming onto Low Water.



Plate 27: Two (2) sets of iron mooring-hoops (MH-01 and MH-02) which adorn the top of the NWQE at ITM 718048E, 734384N and ITM 718063E, 734382N (1m scale).



Plate 28: Cast-iron mooring bollard (MB-01) located between mooring hoops MH-01 and MH-02, at ITM 718034E, 734383N (1m scale).



Plate 29: River access ladder and associated grab-handle (AL-01) located at ITM 718051E, 734383N (50mm scale).

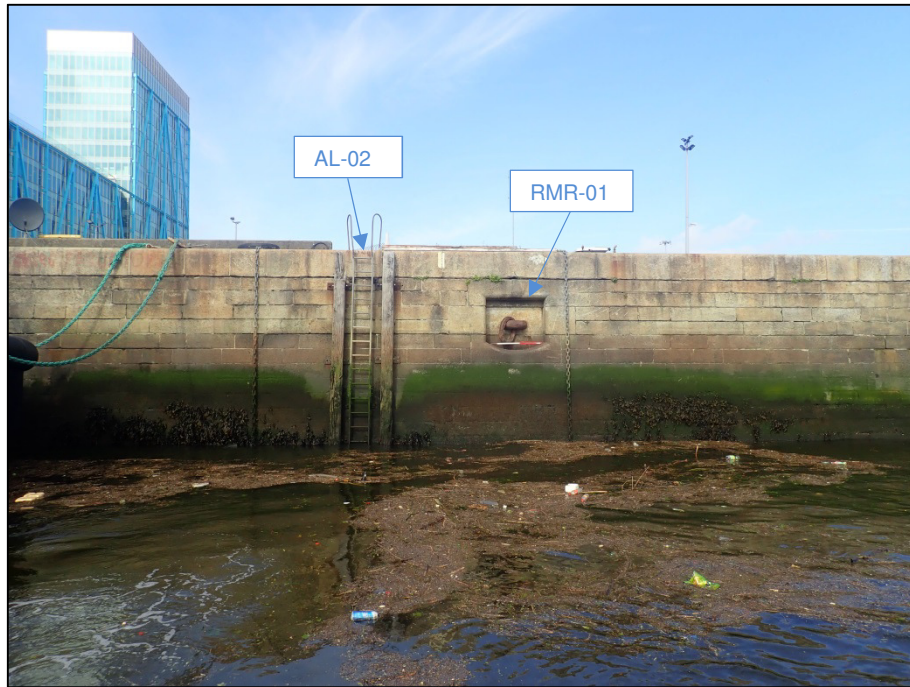


Plate 30: River access ladder (AL-02) and associated timber fenders located at ITM 718066E, 734382N; recessed mooring-ring (RMR-01) located c. 3m downstream (1m scale).



Plate 31: Recessed mooring-ring (RMR-01) located at ITM 718069E, 734381N (1m scale).

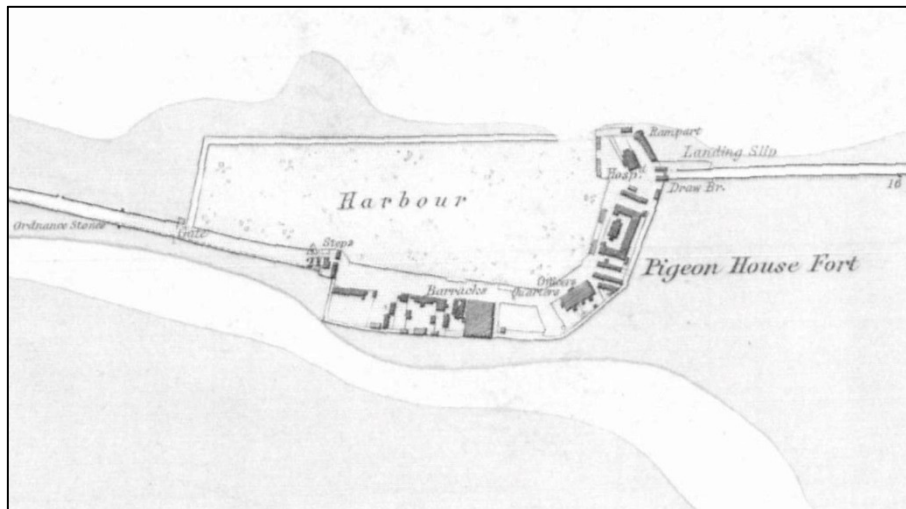


Plate 32: Extract from OS First Edition Map (1837) showing layout of Pigeon House Fort.



Plate 33: East-facing view of Feature F02, quay-wall on channel side of Pigeon House Harbour, to the west of the Sludge Jetty (1m scale).



Plate 34: East-southeast facing view of Feature F02 showing impacts to the quay-wall from a box-culvert and the downstream Sludge Jetty (1m scale).



Plate 35: West-facing view along top of Feature F02; shot taken from west side of the entrance to the Sludge Jetty, note reclamation area in distance (1m scale).



Plate 36: East-facing view of channel side façade of historic pier-head (Feature F02) at entrance to Pigeon House Harbour (1m scale).



Plate 37: North-facing view of masonry comprising internal façade of pier-head, Feature F02 (1m scale).



Plate 38: Shot looking down the external façade of the pier-head (Feature F02) showing a stepped profile to the masonry courses (1m scale).



Plate 39: Opposing access steps, RAS-02 and RAS-03, located on the north and south sides of pier-head at the entrance to Pigeon House Harbour (1m scale).



Plate 40: Detail shot showing masonry steps in-set into quay-wall at pier-head, RAS-02 (150mm).



Plate 41: West-facing view along channel side of Feature F02, showing collapsed masonry from the pier-head access steps (RAS-02) in foreground and upstream Sludge Jetty in the background (1m scale).



Plate 42: View looking down the set of access steps (RAS-03) located on the south side of the pier-head (1m scale).



Plate 43: Cast-iron mooring bollards, MB-02 and MB-03, inset into deck of the pier-head of Feature F02 at entrance to Pigeon House Harbour (150mm scale); ITM 720299E, 733844N and ITM 720315E, 733844N respectively.

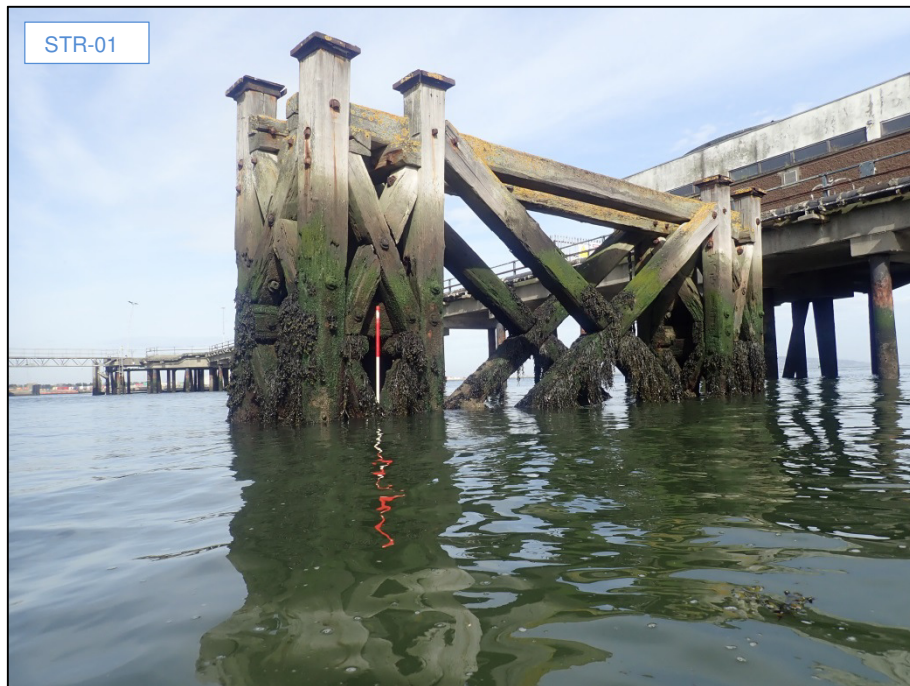


Plate 44: Timber structure (STR-01) located c. 14m north of a culvert for the Pigeon House outfall works at ITM 720262E, 733622; STR-01 is thought to be associated with those works, completed in the 1906 (1m scale).



Plate 45: Southwest-facing view of section of angled retaining-wall (STR-02) located at northwest corner of Pigeon House Harbour (modern extent), ITM 720283E, 733836N; STR-02 comprises the remains of a substructure to a boat launch (1m scale).



Plate 46: Northwest-facing view across face of angled retaining-wall STR-02 (1m scale).



Plate 47: North-facing of sheet pile wall forming a c. 50m-long section of quayside on east side of harbour basin, leading onto modern pier-head at harbour entrance (1m scale).



Plate 48: Southeast-facing view of pier-head forming east side of harbour entrance, note presence of original quay-wall behind this structure.



Plate 49: South-facing view of 34m-long section masonry façade from quayside (Feature F02; east) that originally delineated the harbour entrance, on its east side; ITM 720379E, 738546N to ITM 720414E, 733847N (1m scale).



Plate 50: West-facing view along sheet-pile wall located to the east of a section of masonry façade comprising remains of Feature F02; east (1m scale).



Plate 51: West side of nineteenth-century gun emplacement/viewing platform (STR-03), located c. 45m east of pier-head at the entrance to Pigeon House Harbour (1m scale).



Plate 52: South side of gun emplacement/viewing platform (STR-03) with probable twentieth-century pillbox structure above (1m scale).



Plate 53: South-facing view of masonry quay that delineates the southeast part of the harbour basin (Feature F03) with defensive parapet-wall above (1m scale).



Plate 54: East-facing view of masonry quay that delineates the southeast part of the harbour basin (Feature F03), note underpinning of quay and timber wharf to left of picture (1m scale).



Plate 55: North-facing view of collapsed, twentieth century, quayside on east side of harbour basin, behind which an original masonry quay are located (1m scale).



Plate 56: Original quay-wall (Feature F03) located behind the jumble of collapsed debris from a later quayside (1m scale).



Plate 57: Example of wrought-iron mooring rings that are retained along the façade of masonry quay Feature F03; on east side of harbour basin (150mm scale).



Plate 58: East-facing view along a 120m section the GSW, where it extends between Pigeon House Fort and an ESB Jetty; Survey Area 4, GSW-west (1m scale).



Plate 59: East-facing view along surface of the sea-wall; Survey Area 4, GSW-west (1m scale).



Plate 60: East-facing view of sheet-pile wall and associated rock-armour placed along eastern part of the sea-wall, leading onto the ESB Jetty; Survey Area 4; GSW-West (1m scale).



Plate 61: West-facing view of the surface of the sea wall where slumping/separation of masonry has occurred; Survey Area 4; GSW-West (1m scale).



Plate 62: West-facing view of the surface of the sea wall at a point where there is a noticeable drop in the deck-level; Survey Area 4; GSW-West (150mm/1m scales).



Plate 63: South-southeast facing view of masonry boat-slip (STR-04) located alongside the sea-wall on the east side of Pigeon House Fort Survey Area 4; GWS-west (1m scale).



Plate 64: West-facing view of along the surface of masonry boat-slip STR-04; Survey Area 4; GWS-west (1m scale).



Plate 65: Concreted cast-iron cannon ball, Find No. 23D0037:01; Survey Area 4; GWS-west (150mm scale).



Plate 66: Concreted cast-iron cannon ball, Find No. 23D0037:02; Survey Area 4; GWS-west (150mm scale).



Plate 67: Concreted cast-iron cannon ball, Find No. 23D0037:03; Survey Area 4; GWS-west (150mm scale).



Plate 68: West-facing view of ESB Jetty located on the west side of Survey Area 4, GSW-West 1 (1m scale).



Plate 69: East-facing view of ESB Jetty located on the east side of Survey Area 4, GSW-West 1 (1m scale).



Plate 70: East-facing view of the surface of the sea-wall; Survey Area 4, GSW-west 1 (1m scale).



Plate 71: Example shot of deck masonry forming surface of the sea-wall (Survey Area 4, GSW-west 1); repointed using cement (150mm scale).



Plate 72: East-facing view of the surface of the sea-wall; Survey Area 4, GSW-west 2 (150mm/1m scales).



Plate 73: Example shot of deck masonry forming surface of the sea-wall (Survey Area 4; GSW-west 2); repointed using cement (150mm/1m scales).



Plate 74: West-facing view of the surface of the sea-wall with NORA Oil Jetty in background; Survey Area 4, GSW-west 3 (1m scale).



Plate 75: East-facing view of the surface of the sea-wall with outflow channel background; Survey Area 4, GSW-west 3 (1m scale).



Plate 76: West-facing view of outfall channel that truncates c. 22m section of the GSW between ITM 720820E, 733815N and ITM 720840E, 733518N (1m scale).



Plate 77: East-facing view of the surface of the sea-wall, leading onto bridge over outfall channel; Survey Area 4, GSW-west 3 (1m scale).



Plate 78: East-facing view of channel formed by the GSW and the adjacent sheet-pile wall; Survey Area 4, GSW-east (1m scale).



Plate 79: Northeast-facing view of the surface of the sea-wall with adjacent sheet-pile wall located 22m to the north; Survey Area 4, GSW-east (1m scale).



Plate 80: West-facing view along the surface of the sea-wall; Survey Area 4, GSW-east.



Plate 81: West-facing view of the surface of the GSW at the location of an outfall pipe that truncates the structure, Survey Area 4, GSW-east (1m scale).



Plate 82: West-facing view of the façade of the GSW at a point c. 15m west of the ESB Jetty; Survey Area 4, GSW-east (1m scale).



Plate 83: South-facing view of the GSW from the terminus of the ESB Jetty.



Plate 84: East-facing view of the channel-side façade of the GSW at a point c. 20m east of the ESB Jetty (Survey Area 4, GSW-east); note four masonry courses visible below capping stones before being covered by rock-armour protection (1m scale).



Plate 85: East-facing view GSW (north façade) showing extent of associated rock-armour protection, Survey Area 4, GSW-east (1m scale).



Plate 86: Example shot of large gaps in the rock-armor protection.



Plate 87: South-facing view of the GSW at location of set of masonry access steps, located short distance upstream of a boat-slip (STR-04); twelve (12) masonry courses visible for this section sea-wall (1m scale).

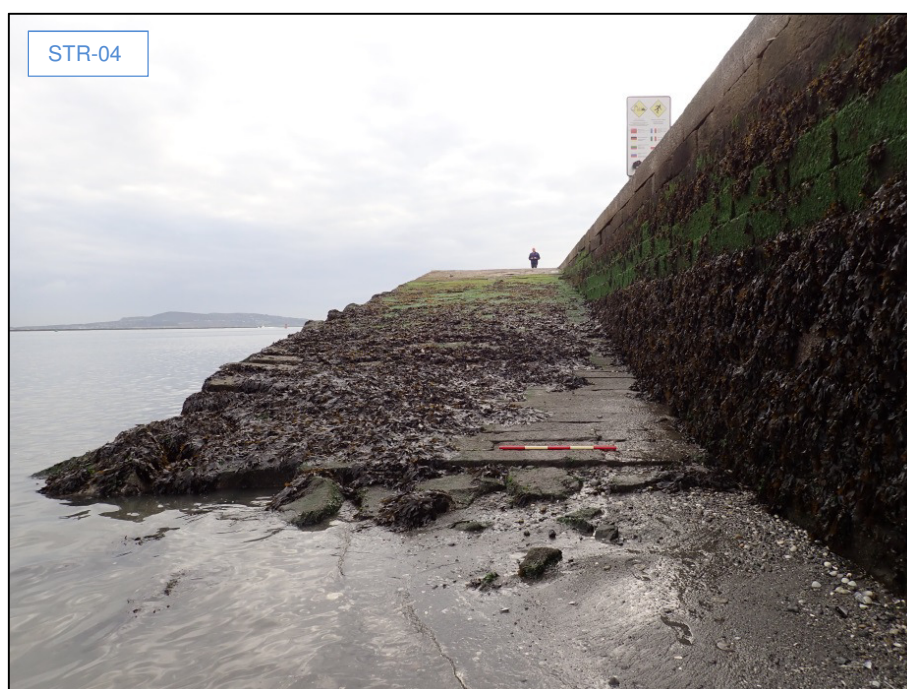
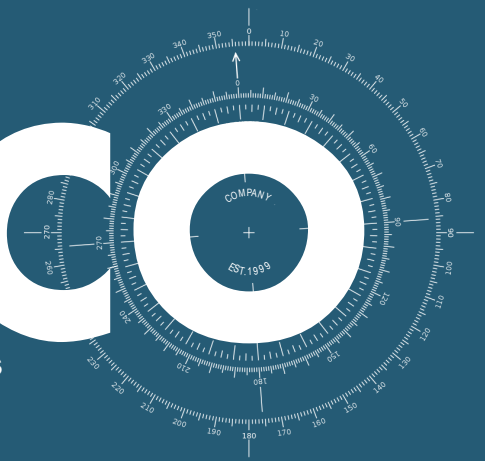


Plate 88: East-facing view of masonry slipway (STR-04) that abuts the north side of the GSW at the eastern limit of Survey Area 4 (1m scale).

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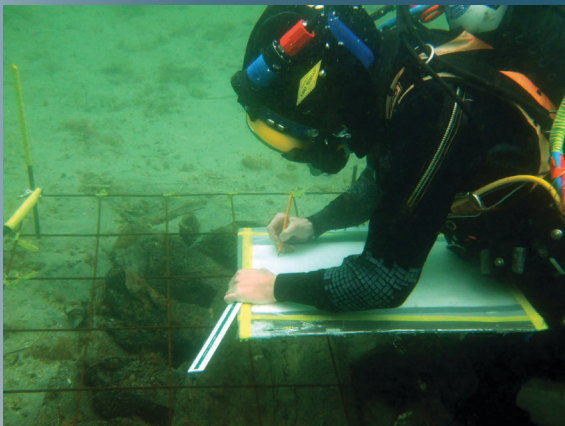
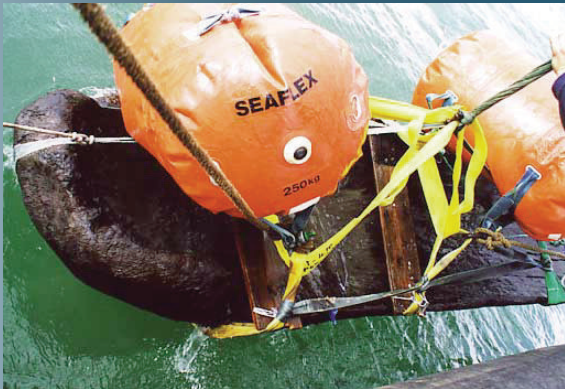


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