



**ElAR Volume 4: Offshore Infrastructure
Technical Appendices
Appendix 4.3.13-4
Archaeology Intertidal Survey
Shanganagh, Dublin Array 21D0046,
21R0071**

Kish Offshore Wind Ltd

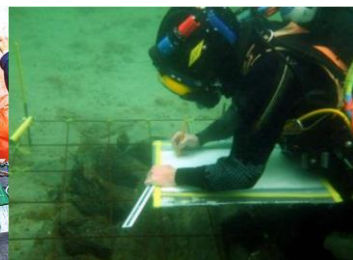
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Archaeology Intertidal Survey
Shanganagh, Dublin Array
21D0046, 21R0071





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Shanganagh, Dublin Array
21D0046, 21R0071**

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Abbreviations

ADCO -	Archaeological Diving Company Ltd
AIA -	Archaeological Impact Assessment
CR -	Cable Route
DHLGH -	Department of Housing, Local Government and Heritage
DA -	Dublin Array
E -	Easting
EIS -	Environmental Impact Statement
GI -	Geotechnical Investigations
ITM -	Irish Transverse Mercator
LA -	Lease Area
LAT -	Lowest Astronomical Tide
MHW -	Mean High Water
N -	Northing
NGR -	National Grid Reference
NIAH -	National Inventory of Architectural Heritage
OD -	Ordnance Datum
SI -	Site Investigations
SMR -	Sites and Monuments Record
UAIA -	Underwater Archaeological Impact Assessment
UTM -	Universal Transverse Mercator

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Executive Summary

Subject: Dublin Array, export cable route landfall option
Location: Shanganagh, Co. Dublin
ITM: North limit: 725991E 723933N
South limit: 726530E 720491N
Status: Intertidal foreshore

Introduction

This archaeological intertidal survey report provides an archaeological assessment of the foreshore at potential Dublin Array cable landfall locations at Shanganagh, Co. Dublin.

The intertidal survey report is based on a desktop review of existing archaeological sources and an inspection of the foreshore that took place at Low Water on 26 May 2021.

Study area

The study area extends along a 3.5km-long stretch of coastline that runs north from Cork Little townland, through Shanganagh, Hackettsland and into Killiney townlands.

Methodology

Desktop study was followed by a site-specific walkover survey, to inform the intertidal baseline archaeology.

Baseline environment

The study area is an area of low cliffs that overlook a rock-strewn/pebble foreshore.

Examination of historic Ordnance Survey mapping indicates a retreating coastline between the mid-1800s and the present day.

The foreshore south of the project area retains the remains of submerged peat deposits and submerged forest remains on Bray North Beach in Cork Great townland.

A series of recorded archaeological sites are indicated on the land above the sea cliffs.

The base of a ruined retaining wall for the nineteenth-century railway line runs along the foreshore extending north from Bray North Beach.

A known shipwreck and a series of recorded marine geophysical survey targets offshore highlight the potential for nearshore shipwreck.

Intertidal inspection

The coastline is one of low cliffs of boulder clay till with layers of sand and gravel that overlook a rock-strewn and shingle foreshore, which overlies sand.

Active coastal erosion is evident.

Elements of the submerged peat deposits and submerged forest are identifiable to the south of the project area, where lower ground is associated with the valley and floodplain of the River Dargle.

The unregistered remains of Battery Tower No. 5 are exposed to active coastal erosion.

The base of the ruined retaining wall for the railway was recorded extending along the foreshore within the project area in Shanganagh townland. Other elements of the former railway line can be traced above the sea cliffs.

A series of small-scale features were recorded along the base of the sea cliffs within the project area.

No shipwreck was recorded within the project area shoreline.

Summary of observations

The Intertidal Archaeology Survey Report is based on a comprehensive desktop assessment and field inspection.

A series of archaeological features were identified within the project area.

Recommendations

Cable installation works should avoid impacting with any of the archaeological sites identified in this report.

Further archaeological assessment would be required should installation works proceed at or close to an archaeological feature. Such further assessment may include detailed archaeological survey, archaeological investigation and reporting.

Should open-cut, test-pitting or other excavation methods be required, additional archaeological assessment may be necessary, and archaeological monitoring of such site works will be required.

The recommendations contained in this Intertidal Archaeology Report are subject to the approval of the National Monuments Service at the Department of Housing, Local Government and Heritage.

1.0 Introduction

This archaeological intertidal survey report provides an archaeological assessment of the foreshore which is the search area for the proposed Dublin Array offshore wind farm cable landfall at Shanganagh, Co. Dublin.

The intertidal survey report is based on a desktop review of existing archaeological sources and an inspection of the foreshore that took place at Low Water on 26 May 2021, under Dive Survey Licence 21D0046 and Detection Device Licence 21R0071 granted by the Department of Housing, Local Government and Heritage, in support of Foreshore Licence FS007029 (FL1).

2.0 Study area

An area of search for offshore cable landfall extends along a 3.5km-long stretch of coastline that runs northwards from Cork Little townland along Shanganagh, Hackettsland and into Killiney townlands (Figure 1).

3.0 Methodology

Information on intertidal archaeology was collected through a detailed desktop review of existing studies and data sets, which include the National Monuments Service's Sites and Monuments Record, Historic Shipwreck Inventory and National Inventory of Architectural Heritage; Dún Laoghaire Rathdown County Council Record of Protected Structures, historic mapping, unpublished reports and relevant publications.

A summary of the site survey undertaken to inform the intertidal archaeology baseline is outlined in Table 1.

Intertidal survey took place on 26 May 2021 at a Low Water Spring tide. It presented the opportunity to view the foreshore when the intertidal zone was exposed to its greatest extent. The day was bright, and the sea state was calm, ensuring good visibility.

A team of four experienced maritime archaeologists carried out the inspection. The team was spread out abreast across the intertidal foreshore at 10m intervals.

A handheld metal-detector was employed by each member, sweeping progressively from east to west as progress forward was made.

Position-fixing of items recorded was achieved with a DPGS Rover unit.

A Drone survey was completed to capture aerial imagery. The Drone was deployed along a pre-determined flight plan focused on the intertidal zone with a 70% image overlap between survey lines to ensure 100% coverage of the survey area. To maintain constant line of sight during flight, the drone was launched from eight separate locations along the route. The survey data was post-processed to provide geo-referenced photo-mosaics at a resolution of 2.6cm/per pixel; allowing objects as small as c. 200mm in diameter to be viewed successfully within the captured data. Geo-tagging of the images was to spheroid WGS84 Lat/Long, with subsequent conversion to ITM.

Access to the site was from Bray North Beach in Bray Commons townland to the south of the site, and progress was made northwards to the northern limit of the site. Site work was completed under consent from the Department of Housing, Local Government and Heritage, Dive Survey 20D0046, and Detection Device 20R0071.¹

Title	Extent of survey	Overview of survey	Survey contractor	Date
Intertidal Archaeology Survey	Offshore export cable landfall	Walkover survey by maritime archaeologists using DGPS, Metal Detector and cameras. Supported by Drone survey	ADCO	May 2021

Table 1: Summary of site-specific survey data.

4.0 Baseline environment, desktop review

4.1 Topography

The wider landscape is part of the low-lying coastal expanse that occurs between the foothills of the Dublin Mountains and the sea. The ground is a boulder clay till and is drained by a series of small rivers and streams that include the River Dargle to the south of the project area and the Loughlinstown River at the north end, which also serves as the townland boundary between Shanganagh and Hackettsland. A mill race (also referred to as the Shanganagh River) that is fed by the Carrickmines River to the north, serves as the townland boundary between Hackettsland and Killiney (Figure 1).

¹¹ The archaeological team comprised Niall Brady, Rex Bangerter, Derek Copeland and Daniel Lenehan.

Examination of historic Ordnance Survey (OS) mapping indicates a retreating coastline between the mid-1800s and the present day. The process can be traced along the full extent of the survey area. Consideration of the Mahera Point location provides an exemplar (Plate 1). When the OS recorded its First Edition 6-inch map series in 1843, there was a clear indication of the land area extending east on to a small shingle spit, and the Martello Tower No 4 (DU026-05501, 02) was visible and set back on to the land (Plate 1a). The OS 25-inch map series was recorded in c. 1907 and was an undertaking that recorded greater detail than previously (Plate 1b). The coastline is better defined, and the shoreline has retreated as it now lies close against the Martello Tower. By 2000, when digital ortho-imagery was recorded, the Martello Tower had succumbed to coastal erosion and the site leaves no trace on the ground today (Plate 1c). Indeed, the railway line that was recorded in 1907 to the west of the Martello Tower has also suffered from coastal retreat, and only the headland provided by Mahera Point preserves a fragment of the line.

4.2 *Palaeo-landscapes within the coastal zone*

The foreshore to the south of the project area holds the remains of submerged peat deposits and submerged forest remains, which are exposed at Bray North Beach in Cork Great townland (Table 2, Figure 1). The 'submerged forest of Bray' was first noted by Robert Lloyd Praeger at the end of the nineteenth century.² The construction of Bray Harbour immediately to the south changed the patterns of sediment transport causing a drop in beach level. As the beach level fell, the ancient forest of Bray emerged from the sands to the north of the harbour. Praeger noted a forest of collapsed 'Scotch pine trees' amid a layer of peat. More recently, the forest has been studied by Jason Bolton, who was able to plot its extent based on fieldwork in 1999 and 2001. Only three trees were partially visible in 1999 and were confirmed as Scots pine. Samples of the wood were taken for dating by radiocarbon analysis and indicated a date of 6,180 (+/-80) years BP (Before Present, with Present determined as AD 1950). This indicates the forest was exposed during the Neolithic period, at a time when people were shifting from hunter-gather existences to agriculture. There is no record of stone tools or other artefacts from among the exposed remains of peat and forest but the potential for such to be recovered is present. In 2001, the beach levels dropped by an average of one metre and sections of the forest were exposed again. Thirty-five trees could be seen during low tide periods found in two locations. The fall in beach levels also exposed a layer of peat embedded with pine cones and other organic material. The submerged peat and forest are not registered archaeological or cultural heritage sites.

4.3 *Settlement history*

² Jason Bolton, 'Lost Forest', *Wild Ireland* March-April 2003, p. 28 and following. What follows is extracted from Bolton's study.

Today much of the wider landscape is suburban sprawl reflecting the growth of Dublin city. During the Middle Ages a large portion of the lands was held by religious houses, and in particular by St Patrick's Cathedral, Dublin and by Christ Church, Dublin.³ Following the redistribution of lands that took place during the sixteenth century, ownership transferred to secular individuals and the area became a landscape of medium-sized estates. In the nineteenth century, a suite of smaller but still grand houses appear, and three examples of these later houses lie close to the present-day shore bordering the study area: Clontra House and its conservatory in Shanganagh townland are registered in the National Inventory of Architectural Heritage (NIAH), and date from the mid-1800s, lying within 80m of the current shoreline (Table 2, NIAH60260138, 60260139, Figure 1). Locksley House is also located within Shanganagh townland and is 180m inland from the shore (Table 2, NIAH60260141, Figure 1), while Rosedale House is a close neighbour and lies slightly further from the shoreline (Table 2, NIAH60260143, Figure 1).

The coastal zone itself appears to have remained relatively undeveloped until the nineteenth century, when Martello Towers and associated features were constructed as part of a coastal defence network to protect Dublin against the threat of Napoleonic invasion.

4.4 Archaeological sites within the coastal zone

The sites and features of archaeological interest identified in the desktop review are summarised in Table 2.

Reference	Detail	Within Cable corridor	Intertidal	Source	Year/author
DU026-014001, 02	Martello Tower and earthwork, Tower No. 6	✓	×	www.archaeology.ie	2018, NMS
None	Battery, Tower No. 5	✓	×	https://irishmartellotowers.wordpress.com/locations-south-dublin/	2012, anon
Shanganagh, 05E0392	Wall fragment close to Martello Tower	✓	×	www.excavations.ie	2005, David O'Connor
DU026-055001, 02	Martello Tower and defensive redoubt. Tower No. 4, site of	✓	✓	www.archaeology.ie	2018, NMS
DU026-026-070	Martello Tower and	×	✓	www.archaeology.ie	2018, NMS

³ Margaret Murphy and Michael Potterton, *The Dublin Region in the Middle Ages. Settlement, Land-use and economy* (Dublin 2010), p. 79.

Reference	Detail	Within Cable corridor	Intertidal	Source	Year/author
	earthwork, Tower No. 3, site of				
NIAH60260138 , 60260139	Clontra House and conservatory	✓	x	www.buildingsofireland.ie	n/a
NIAH60260138 , 60260141	Locksley House	✓	x	www.buildingsofireland.ie	n/a
NIAH60260138 , 60260143	Rosedale House	✓	x	www.buildingsofireland.ie	n/a
None	Historic OS 25-inch map series	✓	x	Railway embankment	None
None	Railway retaining wall	✓	✓	ADCO Report	2017, Niall Brady
None	Submerged peat, submerged forest	x	✓	ADCO Report	2017, Niall Brady
W01828	<i>Loch Fergus</i>	✓	x	https://dahg.maps.arcgis.com/	1899
W11360	Marine geophysical survey target	✓	x	https://dahg.maps.arcgis.com/	Unknown
W11361	Marine geophysical survey target	✓	x	https://dahg.maps.arcgis.com/	Unknown
W11366	Marine geophysical survey target	✓	x	https://dahg.maps.arcgis.com/	Unknown
W11367	Marine geophysical survey target	✓	x	https://dahg.maps.arcgis.com/	Unknown
W11365	Marine geophysical survey target	✓	x	https://dahg.maps.arcgis.com/	Unknown

Table 2: Summary of principal sites and features observed from desktop sources.

Two Martello Towers and one battery are located within the project area, with a further site outside the project area to the south. Additional sites exist to the north of the project area, but these are not discussed here as they lie outside the project area. The first site within the project area is located close to the north end, in Killiney townland: Enoch's Tower (Tower No. 6) is a registered archaeological monument and comprises a Martello Tower and associated earthwork (Table 2, Sites and Monuments Record DU026-014001, -014002, Figure 1). The site was listed as Tower No. 6 in the series of sixteen tower sites constructed along the coast south of Dublin. It is restored as a private residence and overlooks the shoreline.

A battery complex (Tower No. 5) is noted close by to the south in Shanganagh townland, but the battery is not a recorded monument (Figure 1). Archaeological monitoring of a temporary

haul road established during the construction of the Wastewater Treatment Plant at Shanganagh Cliffs exposed a portion of stone wall near the battery that may be related to it (Table 2, 05E0392).

A Martello Tower and associated defensive redoubt site were constructed further south on Mahera Point in Shanganagh townland and are registered archaeological monuments (Table 2, DU026-05501, -005502, Figures 1–2). The tower was listed as Tower No. 4 and is recorded on the First Edition Ordnance Survey six-inch map series (1843) as noted previously (Plate 1). There is a historic photograph that shows it standing (Plate 2). The complex, however, has fallen victim to coastal erosion and does not survive.⁴

Outside the project area to the south is the site of another Martello Tower (DU026-070), known as Tower No. 3, in Cork Great townland (Figure 1). It has also fallen into the sea and there are no traces of the tower visible. The site was recorded on the 1843 map. Local records report that the tower would shake in its foundation during heavy seas and gales. The tower was apparently built ‘on soft rock’ and collapsed into the sea in 1880.

4.5 *Cultural heritage sites within the coastal zone*

If the coastal zone south of Dalkey and Killiney was not exploited for residential purposes in the nineteenth century, it did present itself as a preferred route for the first railway connections from Dublin in the mid-1800s. The Dublin and Wicklow Railway line was routed inland south of Dublin, avoiding the Dalkey/Killiney headland, running through Ranelagh, Milltown, Dundrum, Stillorgan, Foxrock, Carrickmines and Shankill, from where the line continued southeast to the coast to reach Shanganagh Junction in 1854.⁵ From here the line continued the short distance south to Bray where it is understood the presence of the railway connection proved to be of central importance to the success of Bray town in becoming a resort destination in the late nineteenth century.

A spur line was developed extending south from Dalkey to Shanganagh Junction in 1854. The railway line from Dalkey still hugs the coast, as it did south of Shanganagh Junction to Bray. However, the soft glacial till along the coastal route south of Killiney was unable to resist coastal erosion. By 1914 the section of railway between Killiney and Bray had to be diverted inland to gain more protection.

The present-day rail line adjacent to the site area reaches more than 350m inland from its nineteenth-century coastal route. The former route from Shanganagh Junction to Shankill is preserved as a field boundary across Shanganagh Park, while the footings for a retaining wall

⁴ <https://irishmartellotowers.wordpress.com/locations-south-dublin/>

⁵ https://www.railscot.co.uk/companies/D/Dublin_and_Wicklow_Railway/

to support the coastal route are evident on the foreshore at Low Water (Figure 2). The remains are not a registered archaeological or cultural heritage feature.

4.6 *Known shipwreck sites within the study area close to shore*

There is no existing record of shipwrecks or debris along the foreshore, but there is a series of recorded shipwreck sites close to the shore that warrant mention, because their presence highlights the potential for such within the project area. The wreck of the *Loch Fergus* is located approximately 300m offshore of Killiney railway station (Table 1, W01828, Figure 1). The vessel was an 818- / 874-tonne iron barque registered in Glasgow that was *en route* from Glasgow to Brisbane when she was driven ashore on 06/02/1899 during a South-Southeast (SSE) gale and wrecked. The site lies in shallow water at 4–5m deep and is spread over an area measuring 65m by 10m. Five other potential sites are recorded within the study area to the south of the *Loch Fergus* (Table 2, W11360, W11361, W11366, W11367, W11365). The targets were not recorded in the recent marine geophysical survey completed for the Dublin Array project.⁶

5.0 Intertidal inspection

5.1 *Topography*

The sea cliffs extend along the length of the site area from south to north. The cliffs exist between the two principal riverine areas to the south and north, where the rivers have cut low valley areas through the cliffs. To the south of the project area this is associated with the River Dargle at Bray. To the north, and within the project area, this is associated with the Loughlinstown and Shanganagh Rivers as they empty into Killiney Bay

Coastal erosion remains active right along the foreshore, revealing freshly-calved profiles through the sea cliffs. Layers of boulder clay till predominate, with lenses of fine sand and gravel interspersed (Plates 3–4). The sand lenses are frequently colonised by sand martins. There are no clear exposures of bedrock.

The lower-lying land associated with the River Dargle lies outside the project area to the south and retains a low cliff edge that appears to be mostly an artefact of the site having served previously as a coastal landfill site, where the ground level has been built up from dumped spoil and waste (Plate 5). It is in front of this area that the remains of the submerged peat and the submerged forest survive. The natural profile seaward from here is a gradual slope away from the low river valley deposits of the Dargle and its northern floodplain. The lower-lying land

⁶ Maritime Archaeology, 'Dublin Array Offshore Wind Farm. Geophysical Survey 2021: Archaeological Report. Detection Device Licence 21R0027', RWE Renewables Ireland, 2022, p. 31.

associated with the Loughlinstown River at the north end of the survey area is a grassy surface over low elevations of till that merge with a shingle beach.

The High Water Mark extends virtually to the base of the sea cliffs within the project area, and much of the intertidal zone is populated with boulders that would be the heavier fraction of the boulder-clay strata that have collapsed, where the boulders remain as they fall when the sea-cliff calves (Plate 6). Smaller pebbles and shingle are interspersed among the boulders and all the stone overlies sand. Clay horizons are also evident under the stone in places. The shoreline slopes seawards and below the neap Low Water Mark the stone and shingle are progressively replaced with coarse sand, which continues seaward over what is for the most part a gentle shallow descent. A Spring Tide Low Water reveals a wide foreshore, much of which is sandy.

5.2 *Submerged peat and forest*

The submerged peat and forest are clearly present across much of the storm beach that extends north along Cork Great townland at the Low Water line, south of and outside the project area (Plates 7–8). The exposure is one part of a greater extent that in all likelihood continues south into Bray Commons townland, but the imposition of rock armour to protect the premises on the north side of Bray Harbour has buried any element of the former peatland and forest at this point.

The peat is represented by a spongy clay-sand matrix in which small twigs and withies are evident. The forest is represented by substantial trunk bases that appear to be still rooted below the covering sands, and by horizontal members that are partially exposed above the sands.

As one progresses north along the foreshore at Cork Great townland, the visible remains of the ancient landscape fade, but equally the height of the foreshore increases. Therefore, it is possible that such palaeo features will extend further north but are buried under boulders.

The remains appear to extend beyond the limits of the peat and forest identified in 1999 and 2001 to the north and to the east.

5.3 *Martello Tower features*

There is no indication of Martello Tower Nos 3 or 4 today as both sites have been destroyed by coastal erosion. Given that the sites were constructed on the cliff-tops above the foreshore, there is nothing in the foreshore deposits that could be associated with the sites. Nor are there indications in the current cliff edges, where one might expect to see sections through truncated cut features such as pits and trenches if they survived.

There are, however, standing remains associated with the Battery, Tower No. 5. This is not a registered archaeological site and nor is it catalogued in the National Inventory of Architectural Heritage, yet it is integral to the Martello Tower coastal defence system that served to protect Dublin. The Battery site today is starting to fall into the sea. The historic OS First Edition (1843) and 25-inch series (c. 1907) recorded the site as two rectangular-shaped enclosures set at right angles to each other that form an L-shape plan (Plates 9–10). The two principal elements remain (Figure 9). The southern element is overgrown, but the northern element is accessible. It is a stone-walled enclosure with a gable end on its east side that includes a chimney breast. Within the enclosure is a small squat building that has a barrel vault constructed using red brick (Plate 11). The eroding cliff edge is encroaching into the interior of the enclosed space. There are no obvious indications of collapsed stone on the foreshore below (Plate 12). Left in its unprotected state, Battery Tower No. 5 will fall victim to coastal retreat in the near future.

5.4 *Railway retaining wall*

The retaining wall of the railway is a ruinous feature with only the basal courses surviving but it is striking in the sense that much of it remains exposed. The base of the wall can be traced over a continuous length that runs north from Cork Great townland and into the southern half of Shanganagh townland, where it extends 537m into the project area, and the wall-base lies some 40m seaward of the cliff edge (Figures 4–5).

The Ordnance Survey's 25-inch map series (c. 1907) records part of the wall in Cork Great townland to the south of the project area (Plate 13). It shows a series of four buttresses that support a 270m-long stretch of wall, with embankments indicated to the north and south. The presence of the wall or buttresses are not recorded elsewhere on the historic map along this route and suggests a localised attempt to protect the railway line from coastal erosion. The remains of the buttresses survive today (Plate 14).

The 25-inch map (c. 1907) otherwise indicates that the railway line was constructed inside the retaining wall and that the ground sloped down from the railway tracks to the wall (Plate 15). Further north, outside the project area, a retaining wall still supports the existing railway line from Dalkey to Killiney as it passes White Rock beach in this way and provides an understanding of what the retaining wall along Shanganagh might have looked like originally (Plates 16–17).

As plotted on Figure 4 and the very left-hand side of Figure 5, the base of the retaining wall is clearly visible on the foreshore as a continuous wall that extends along the Low Water Mark for 537m, where it is approximately 40m seaward of the current sea cliff.

The retaining wall along this stretch survives as a low-standing wall base that is often not more than 300mm above the foreshore and sometimes reaching 500mm (Plates 18–22). It is clear

that the exposed portion is not the bottom of the wall and that its full depth extends deeper; boulders have accumulated on both sides and while they form the current foreshore, they also clearly overlie the natural underlying bed. The wall retains a façade of shaped granite blocks that is in the order of 400mm deep and is built against a wall core of rounded boulders. The mortared core is in the order of 1200mm deep and stands above the façade stone in places by 200mm (Plate 19). While the wall follows a straight line, there are several points where it appears to step out seawards. These locations may be points where a further base layer or plinth exists, rather than being lengths of buttressing. A boulder field is established seaward of the retaining wall. The boulder field is presumably populated with collapsed wall elements (Plate 21).

There is one location along this stretch of wall where chunks of wall lie collapsed against it, and up to four courses of stonework are in the collapsed portions (ITM 726483E 720777N) (Figure 4, Plates 23–24). A little further along to the north, a stretch retaining three courses survives *in situ* (Figure 4, Plate 25). The façade retains a slight batter, and the granite blocks are all weathered with rounded and smoothed faces.

At the northerly extent of the visible wall (ITM 726393E 721072N), the formation of an oblique line of shingle running from the Low Water Mark towards the cliff follows the historic route of the railway line inland along what was the line from Shanganagh Junction to Shankill. The former embankment survives above the cliff top and continues across Woodbrook Golf Course and Shanganagh Park (Figure 5).

The line of track that connected Shanganagh Junction with Killiney and Dalkey to the north would have run along the coast, but its remains are not visible at this point. The remains are however evident where the line survives as a c. 500m-long embankment along the cliff top at Mahera Point, east of Locksley House and inland from the site of Martello Tower No. 4 (Figure 6). A granite-built underpass still present today would have held the rail line (Plate 26). The underpass provides access from Shanganagh Park on to the beach below, and today that access point has been rendered with modern concrete to present a ramped walkway (Plate 27). The walkway is undercut by coastal erosion.

The coastline bites in slightly to the north of Mahera Point, and the coastal erosion has removed Martello Tower No. 4 and has truncated the former railway line that ran close to the shore (Figure 7). Another granite-built underpass is exposed in the cliff face, and elements of its walling lie collapsed on the foreshore (Figure 7, Plate 28). The historic 25-inch map records the underpass, which extended along a field boundary that linked to Clontra House (NIAH60260138) (Plate 29). The underpass is quite narrow and today a plastic pipe runs down under its ground surface. It is possible that originally the underpass provided private access to the beach for the residents of Clontra House. A length of concreted wall runs north from the collapse on the foreshore for a

short distance and this is a remnant of the railway's original retaining wall (Plates 30–31). This element is quite denuded and is washed smooth from wave action.

There is another access point to the beach where the railway line crossed the seaward side of Corbawn Lane (formerly Canbawn Lane) (Figure 8). There is no clear indication of an underpass here, but the access point remains and is today constructed from various concrete slab that has been reinforced against coastal retreat in recent years with rock armour.

Evidence of the railway is indicated running along the current cliff top at Shanganagh Cliffs, where two parallel lengths of embankment survive to the south of the Napoleonic era Battery (Tower No. 5) (Figure 9). This is the final place where the railway line is exposed close to the foreshore; from here the railway line was set back a little further, as recorded on the historic OS 25-inch map (c. 1907). Today, a footpath that runs along the eastern perimeter of the Wastewater Treatment Plant follows the line of the railway. The footpath continues north across the low ground in Hackettsland townland between the Shanganagh and Loughlinstown rivers, where the former railway line was embanked (Plates 32–33). Where the straight line of the footpath ends in Hackettsland, the historic railway reached further north to the west of Enoch's Tower (DU026-014001, 02), where the DART line runs today.

5.5 *Other features*

A series of sheet-pile alignments extend seaward from the base of the retaining wall south of the project area. The steel-work is eroded and is not modern (Plates 34–35). The alignments lie below the Low Water Mark, but the tips of the steelwork are apparent at low water. It is likely that these features are associated with the railway line and reflect attempts to slow down the coastal erosion by encouraging the deposition of sediment. As such, the sheet piles appear to represent an early attempt to create groynes. The fact that only the steelworks survive today indicates that this engineering solution was not successful.

A steel outfall pipe extends seaward from the public access ramp at Mahera Point (Figure 6).

A wooden drainage pipe extends out from the base of the sea cliff at ITM 726664E 720885N (Figure 5, Plate 36). The timber is square in section with the perforation of a circular bore-hole.

The low sea cliff just north of Battery No. 5 has been cut away and the site protected with a mortared boulder barrier to accommodate the land fall for Shanganagh Long Sea Outfall, which extends 1km offshore (Plate 37).

No shipwreck debris was observed within the project area shoreline.

The metal detector did not reveal any features that were not already visible along the foreshore.

5.6 Summary of observations

The Intertidal Archaeology Report is based on a comprehensive desktop assessment and field inspection. Archaeological features and potential features were identified within the intertidal area along the southern half of the project area, with other sites located in the northern half. The observations are summarised in Table 3.

Reference	Detail	ITME	ITMN	Recommendation
DU026-014001, 02	Martello Tower and earthwork, Tower No. 6	725933	723826	Avoid impact
None	Battery, Tower No. 5	725969	723095	Avoid impact
None	Railway embankment retaining wall, north section	726181	722080	Avoid impact
DU026-055001, 02	Martello Tower and defensive redoubt. Tower No. 4, site of	726287	721836	Avoid impact
None	Wooden drainage pipe	726664	720885	Avoid Impact
None	Railway retaining wall, south section. Note, this continues as an unbroken continuous feature for 537m within the project area to the southern boundary, and it continues further south almost to Bray harbour. The two coordinates given refer to the northern limit and the southern limit within the project area	726393 and 726535	721072 and 720510	Avoid impact

Table 3: Heritage assets observed within the project foreshore area.

The survey highlighted the ruined battery complex (Tower No. 5) on the cliff edge in Shanganagh townland that is part of the wider Napoleonic-era coastal defence of Dublin. The battery is not a registered monument. However, the site is considered to be so, and this report recommends the site is added to the Sites and Monuments Record and is afforded statutory protection.

The survey highlighted the footings of the former retaining wall for the nineteenth-century railway that are exposed along much of the southern section of the survey area in Shanganagh townland and extend into the northern section. The wall base is revealed at Low Water. It is not a registered archaeological site; however, it is a heritage asset and should be considered as such. It is recommended that the site is added to the Industrial Archaeological heritage inventory.

The survey recorded a length of timber drain that is exposed at the base of the sea cliff. The drain is of not great antiquity and presumably dates from the nineteenth/early twentieth century.

6.0 Recommendations

Cable installation works should avoid impacting with any of the archaeological sites and features identified in this report. Those sites and features that occupy the intertidal foreshore are summarised in Table 3.

The need for further archaeological assessment would be required should installation works proceed at or close to a recorded archaeological site or feature. Further assessment may include detailed archaeological survey, archaeological investigation and reporting.

Should open-cut, test-pitting or other excavation methods be required, additional archaeological assessment may be necessary, and archaeological monitoring of such site works will be required.

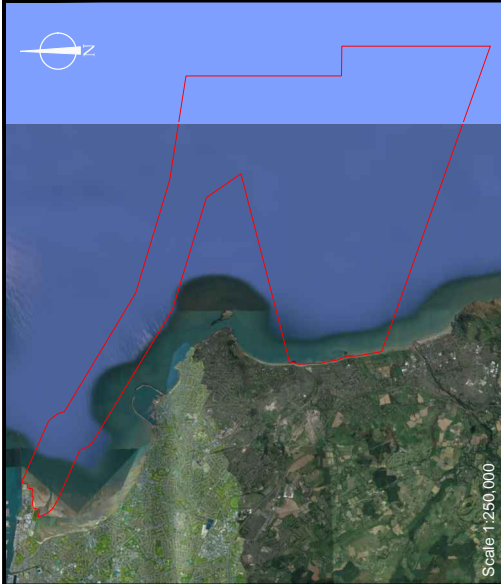
The recommendations contained in this Intertidal Archaeology Report are subject to the approval of the National Monuments Service at the Department of Housing, Local Government and Heritage.

7.0 References

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- Historic Shipwreck Inventory, <https://dahg.maps.arcgis.com/>
- Irish Martello Towers, <https://irishmartellotowers.wordpress.com/locations-south-dublin/>
- Railscot, https://www.railscot.co.uk/companies/D/Dublin_and_Wicklow_Railway/
- Sites and Monuments Record, www.archaeology.ie



Development Boundary

Extent of ADCO Interstitial Survey

Extent of ADCO Aerial Drone Survey

Approximate extent of submerged Peat/Forest

Site listed in the RMP

Site listed in the Shipwreck Inventory; note, positions not fixed.

Scale 1:250,000



Notes
Source: Google Satellite Imagery, April 2021

A4

Job/Exc No.
21D0046

Compiled by
R. Bangerter

CAD reference
Bray_2021

Client
Maritime Archaeology for RWE Renewables Ireland

Project
Dublin Array


Title
Figure 1 - Proposed Shanganagh Cable Landfall corridor with Recorded Cultural Heritage Sites, Natural Features, and extent of ADCO Interstitial Survey Area superimposed.




Notes ADCO Drone Survey thumbnails Source: ADCO Drone Survey thumbnails superimposed upon Open Source Street Map.		A4	Job/Exc No. 21D0046	Compiled by R. Bangerter	CAD reference Bray_2021	Client Maritime Archaeology for RWE Renewables Ireland	Title Figure 2- Map showing location of Aerial Drone Survey Areas A-C.	
			Date 09.09.21	Scale 1:7500	Drawing No. Figure 2	Project Dublin Array		






	Notes Imagery captured by ADCO (R.Bangerter/ D.Lenehan) on 17th July 2021 using an aerial drone [coordinate projection- WGS84]. [Plan view imagery superimposed upon Google Satellite Imagery gathered April 2021].	A3	Job/Exc No. 21D0046	Compiled by R.Bangerter	CAD reference Bray_2021	Client Maritime Archaeology for RWE Renewables Ireland	Title Figure 4- Aerial Drone Survey of a 478m section of intertidal foreshore (Section A) located 1km to the north of Bray Harbour; Plan and Isometric view.
			Date 06.09.21	Scale 1:1400	Drawing No. Figure 4	Project Dublin Array	




	Notes Imagery captured by ADCO (R.Bangerter/ D.Lenehan) on 17th July 2021 using an aerial drone [coordinate projection- WGS84]. [Plan view imagery superimposed upon Google Satellite Imagery gathered April 2021].	A3	Job/Exc No. 21D0046	Compiled by R.Bangerter	CAD reference Bray_2021	Client Maritime Archaeology for RWE Renewables Ireland	Title Figure 5- Aerial Drone Survey of a 524m section of intertidal foreshore (Section B) located 1.478km to the north of Bray Harbour; Plan and Isometric view.
			Date 06.09.21	Scale 1:1400	Drawing No. Figure 5	Project Dublin Array	




	Notes Imagery captured by ADCO (R.Bangerter/ D.Lenehan) on 17th July 2021 using an aerial drone [coordinate projection- WGS84]. [Plan view imagery superimposed upon Google Satellite Imagery gathered April 2021].	A3	Job/Exc No. 21D0046	Compiled by R.Bangerter	CAD reference Bray_2021	Client Maritime Archaeology for RWE Renewables Ireland	Title Figure 6- Aerial Drone Survey of a 430m section of intertidal foreshore (Section C) located 2km to the north of Bray Harbour; Plan and Isometric view.
			Date 06.09.21	Scale 1:1400	Drawing No. Figure 6	Project Dublin Array	




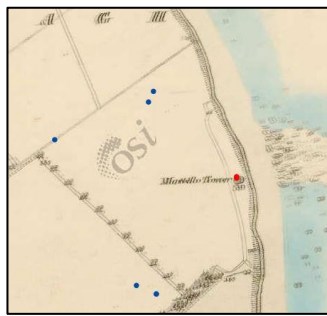
	Notes Imagery captured by ADCO (R.Bangerter/ D.Lenehan) on 17th July 2021 using an aerial drone [coordinate projection- WGS84]. [Plan view imagery superimposed upon Google Satellite Imagery gathered April 2021].	A3	Job/Exc No. 21D0046	Compiled by R.Bangerter	CAD reference Bray_2021	Client Maritime Archaeology for RWE Renewables Ireland	Title Figure 7- Aerial Drone Survey of a 430m section of intertidal foreshore (Section D) located 2.4km to the north of Bray Harbour; Plan and Isometric view.
			Date 06.09.21	Scale 1:1400	Drawing No. Figure 7	Project Dublin Array	



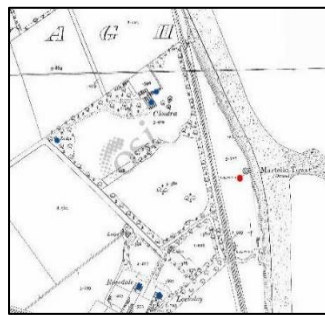
	Notes Imagery captured by ADCO (R.Bangerter/ D.Lenehan) on 17th July 2021 using an aerial drone [coordinate projection- WGS84]. [Plan view imagery superimposed upon Google Satellite Imagery gathered April 2021].	A3	Job/Exc No. 21D0046	Compiled by R.Bangerter	CAD reference Bray_2021	Client Maritime Archaeology for RWE Renewables Ireland	Title Figure 8- Aerial Drone Survey of a 539m section of intertidal foreshore (Section E) located 2.9km to the north of Bray Harbour; Plan and Isometric view.
			Date 06.09.21	Scale 1:1400	Drawing No. Figure 8	Project Dublin Array	



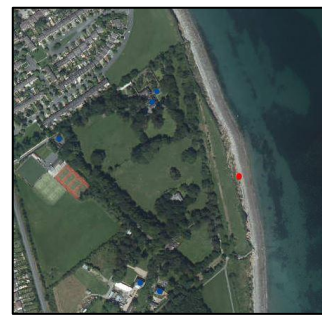
	Notes Imagery captured by ADCO (R.Bangerter/ D.Lenehan) on 17th July 2021 using an aerial drone [coordinate projection- WGS84]. [Plan view imagery superimposed upon Google Satellite Imagery gathered April 2021].	A3	Job/Exc No. 21D0046	Compiled by R.Bangerter	CAD reference Bray_2021	Client Maritime Archaeology for RWE Renewables Ireland	Title Figure 9- Aerial Drone Survey of a 430m section of intertidal foreshore (Section F) located 3.2km to the north of Bray Harbour; Plan and Isometric view.
			Date 06.09.21	Scale 1:1400/ 1:4500	Drawing No. Figure 9	Project Dublin Array	



a



b



c

Plate 1: Mahera Point as recorded by Ordnance Survey in 1843 (a.), c. 1907 (b.) and 2000 (c), with overlay of recorded archaeological sites (red dot) and registered sites of architectural heritage (blue dots).

Source: www.archaeology.ie



Plate 2: Historic photograph looking south from Killiney Hill along shoreline at Shanganagh, showing Martello Tower No. 4 (DU026-05501) on Mahera Point still standing, before it succumbed to destruction through coastal retreat. (Arrow added to highlight tower.)

Source: <https://irishmartellotowers.wordpress.com/locations-south-dublin/>



Plate 3: View looking north along shoreline at Shanganagh, showing nature of sea cliff and slumped till at its base. ITM 726505E 729481N.



Plate 4: View facing sea cliff in Shanganagh, showing nature of exposed till and sand strata. The small holes penetrating the sand layers in the middle of the picture are created by sand martins as part of their nests.



Plate 5: View of landfill site that has infilled the low-lying land area south of the project area close to Bray Harbour and creates a low cliff face of eroding debris and soil.



Plate 6: View looking north along Shanganagh showing boulders and rock that litter the foreshore as natural features that were probably included within the boulder clay strata before the coastline was eroded, removing the clays and lighter fractions and leaving the heavier elements to make up the foreshore.



Plate 7: Example of old tree bough that is one of several timbers exposed at Low Water that reveal the presence of the submerged forest south of the project area.



Plate 8: Elements of peat and timber from the submerged peat and forest that are exposed at Low Water south of the project area.

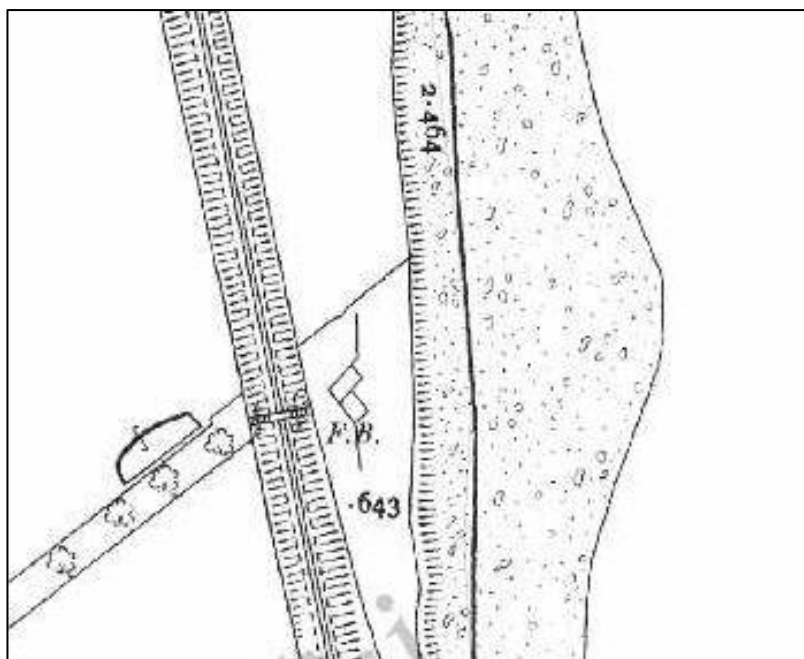


Plate 9: Extract from historic OS 25-inch map (c. 1907) showing Battery Tower No. 5 with still ample space between the complex and the cliff edge. Today the cliff edge is right against the wall (see Figure 9).



Plate 10: View from west showing the perimeter wall of the northern enclosure associated with Battery Tower No. 5, from the outside.



Plate 11: View looking west at squat building that supported a brick barrel vault, within the Battery enclosing wall.



Plate 12: View looking down to the beach below the sea cliff at Battery No. 5, where there are no lengths of collapsed masonry associated with the Battery, yet.

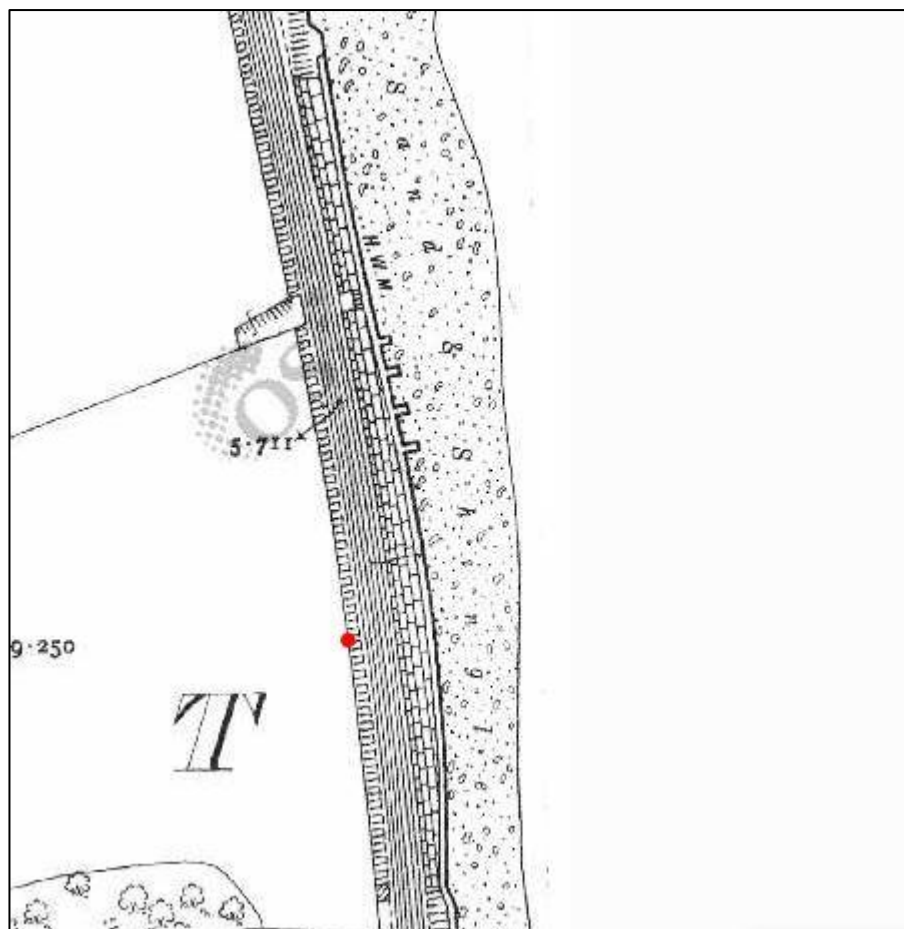


Plate 13: Extract from OS 25-inch map (c. 1907) showing a stretch of buttressing to the retaining wall as it extended along Cork Great townland, south of the project area. The map includes the overlay showing the former location of Martello Tower No. 3 (DU026-070) which, along with the railway line, has fallen victim to coastal erosion.



Plate 14: Example of stone buttress that forms part of the retaining wall south of the project area.

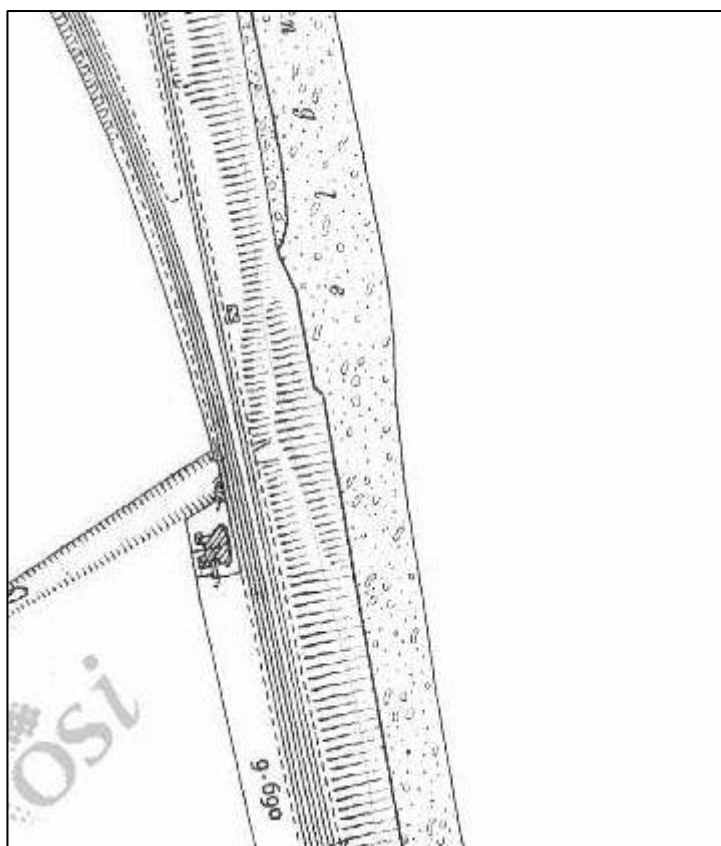


Plate 15: Extract from OS 25-inch map (c. 1907) showing where the line from Shankill merged with that from Dalkey, in Shanganagh townland close to Shanganagh Junction. The detail shows the railway line constructed inside the retaining wall and that the ground sloped down from the railway tracks to the wall.



Plate 16: View of railway retaining wall at White Rock beach north of the project area. The granite-built wall retains a sloped embankment on top of which the railway line runs. It offers a comparator to what might have existed originally in Shanganagh.



Plate 17: View of railway retaining wall and embankment at White Rock beach, north of the project area.



Plate 18: View looking north at base of retaining wall showing intact wall core. Position of image indicated on Figure 4.



Plate 19: View looking north at base of retaining wall showing intact wall core and façade. Position of image indicated on Figure 4.



Plate 20: View looking north at base of retaining wall. Position of image indicated on Figure 4.

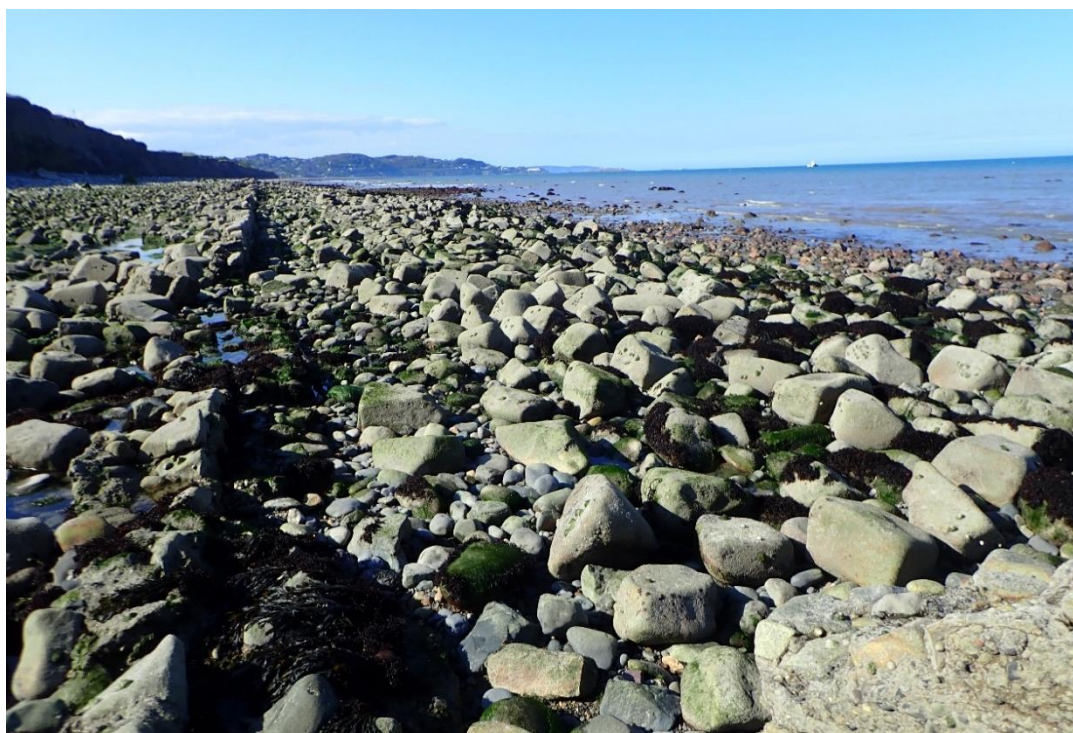


Plate 21: View looking northeast across boulder field that is established seaward of the retaining wall. The boulder field is presumably collapsed wall elements. Position of image indicated on Figure 4.



Plate 22: View looking north at base of retaining wall with external layer that might be an exposed plinth or an additional basal layer. Position of image indicated on Figure 4.



Plate 23: View looking north at base of retaining wall showing location where a chunk of the collapsed wall survives. Position of image indicated on Figure 4.



Plate 24: View looking north at base of retaining wall showing location where a further chunk of the collapsed wall survives. Position of image indicated on Figure 4.



Plate 25: View looking north to where three course of stonework survive *in situ*. Position of image indicated on Figure 4.



Plate 26: View looking west through granite-built underpass that formerly supported the Dalkey-to-Shanganagh Junction spur line, and which continues to provide access to the beach from Shanganagh Park.



Plate 27: View looking inland from the foreshore towards the reinforced access to Shanganagh beach today. Note the modern concrete works are undercut by coastal erosion.



Plate 28: View looking inland from shore at ruined granite underpass that may have provided private access from Clontra House to the beach.

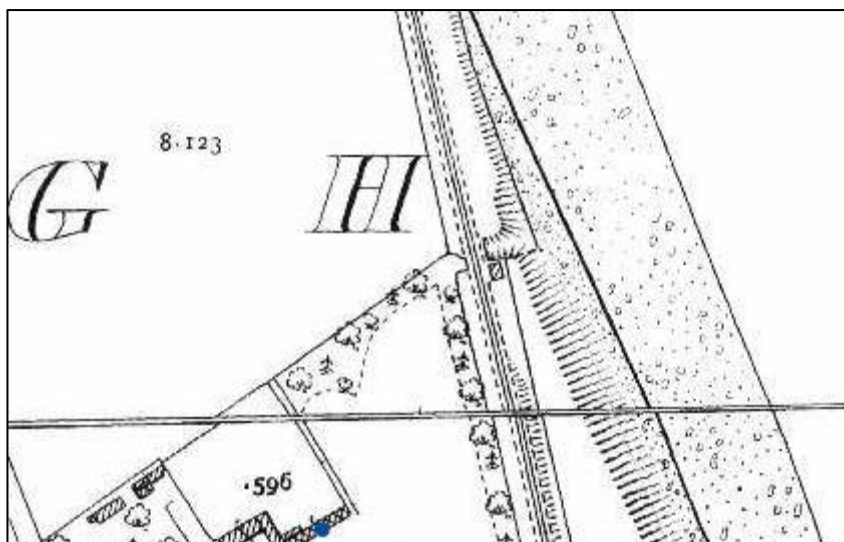


Plate 29: Extract from OS 25-inch map showing the arrangement to provide an underpass from Clontra House (NIAH60260138) on to the beach.



Plate 30: View looking North-northwest at the line of mortared stone that is the base of the railway retaining wall that continued north from the Clontra House underpass.



Plate 31: View looking south at the line of mortared stone that is the base of the railway retaining wall that continued north from the Clontra House underpass. The ruined underpass is visible at the cliff-top.



Plate 32: View looking north along former railway embankment that crosses Hackettsland townland into Killiney and is today a footpath that gives access to Killiney beach.



Plate 33: View looking west and upstream from the mouth of the Loughlinstown River towards a railway bridge that supported the former railway line across Hackettsland townland, and which today is footpath.



Plate 34: View of historic sheet piling that runs along exterior of railway retaining wall to the south of the project area. The steel piles are heavily eroded by coastal processes.



Plate 35: View looking seawards and south of the project area, where steel posts are set out at regular intervals, as the surviving anchor elements presumably groyne features to combat coastal erosion.



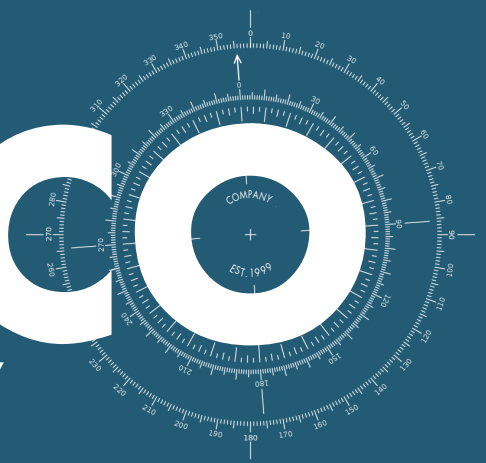
Plate 36: View from north of wooden drain that extends out of the eroding cliff face. Position is indicated on Figure 5.



Plate 37: Landfall location of the Shanganagh Long Sea outfall. The works have cut away the sea cliff and inserted a mortated boulder barrier. The cut is clearly visible on Figure 9, as is the back-filled trench that accommodates the sewer pipe extending out to sea.

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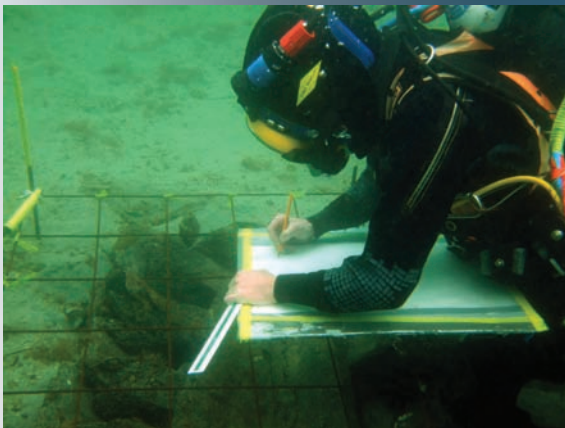
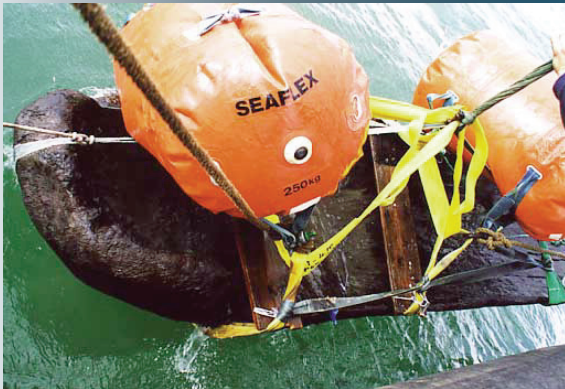


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