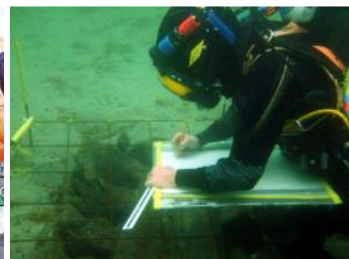
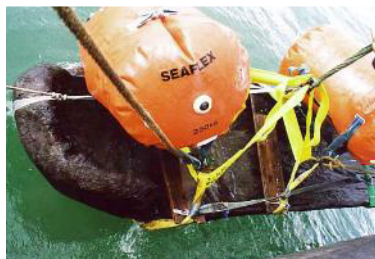
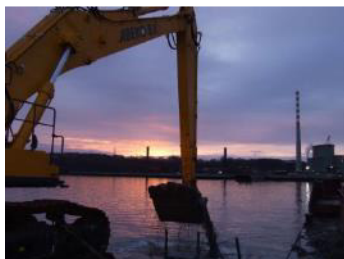
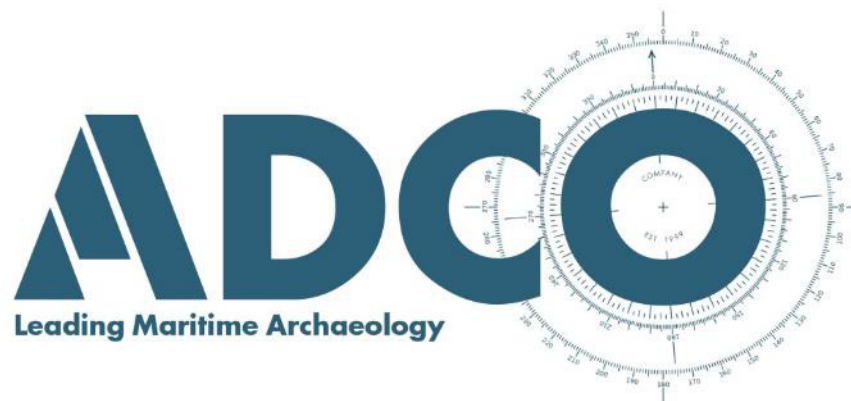




**Underwater Archaeological Impact Assessment (UAIA)
Proposed Rowing Pontoon
River Liffey
Islandbridge, Co. Dublin**

23D0020, 23R0117





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23D0020, 23R0117

Date
Client
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06 June 2023
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LIST OF ABBREVIATIONS

ADCO	The Archaeological Diving Company Ltd
DHLGH	Department of Housing, Local Government and Heritage
DGPS	Differential Geographic Positioning System
ING	Irish National Grid
ITM	Irish Transverse Mercator
GNSS	Global Satellite Navigation System
E	Easting
N	Northing
NGR	National Grid Reference
NIAH	National Inventory of Architectural Heritage
OD	Ordnance Datum
OS	Ordnance Survey
RMP	Record of Monuments and Places
RPS	Record of Protected Structures
SMR	Sites and Monuments Record
UAIA	Underwater Archaeological Impact Assessment
UAU	The Underwater Archaeology Unit

EXECUTIVE SUMMARY

Subject: UAIA, proposed Rowing Pontoon.

Location: Islandbridge, River Liffey, Dublin.

Riverine Impact: localised bankside/riverbed impacts.

Survey Extent: ITM 712282E, 734217N (upstream) - ITM 712300E, 734339N (downstream).

The Archaeological Diving Company Ltd (ADCO) was appointed by Rubicon Heritage, on behalf of the Dublin City Council (DCC), to carry out an Underwater Archaeological Impact Assessment (UAIA) of the footprint of a proposed rowing pontoon located at Islandbridge on the River Liffey.

The archaeological survey was conducted, under licence from the DHLGH, on 18th April 2023; under licence numbers 23D0020, 23R001117.

The following report, based on the current level of information available, recommends that no further pre-construction archaeological measures are required as part of the proposed pontoon development. However, given the developments proximity to the an eighteenth-century Weir (NIAH 5006026) and the potential for existing ground levels/riverbed to retain buried features relating the river's historic use, a number of construction phase mitigation measures are required. This includes Archaeological Monitoring of the following construction items:

- Installation of a temporary access bridge to ensure no impact to the historic elements of the weir structure.
- Excavation/removal of any bankside deposits (regrading of southern bank) required as part of the installation of a temporary access bridge.
- Excavation of the riverbed/bank structure associated with installation of a caisson landing area for the floating pontoon.

The archaeological monitoring is to be carried out by a suitable qualified archaeologist with suitable experience in riverine archaeology. The archaeological work should be carried out in accordance with the terms of Section 5 of the National Monuments Act (2004 Amendment).

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 Ltd was appointed by Rubicon Heritage on behalf of Dublin City Council (DCC) to carry out an Underwater Archaeological Impact Assessment (UAIA) of the footprint of a proposed rowing pontoon at Islandbridge, River Liffey, Dublin (Figure 1).

The UAIA was carried out in accordance with Section 5 of the National Monuments Act (2004 Amendment) by a team of underwater archaeologists on the 18th April 2023, under licence from the DHLGH; licence numbers 23D0020 and 23R0117. The onsite work included the following items:

1. A visual survey of the islands, foreshore and intertidal zone of the River Liffey that may be impacted by the proposed development.
2. A dive survey of the underwater area that may be impacted by the proposed development.
3. Sample metal-detection survey of the underwater area that may be impacted by the proposed development.

The following report presents the findings from the UAIA and assesses the potential level of riverine impact arising from the proposed development, providing a set of specific mitigation measures relating to those impacts.

2.0 PROPOSED DEVELOPMENT

The proposed development is for a rowing pontoon located on a small island in the middle of the River Liffey downstream of the weir at Islandbridge (Figure 2). Rowing clubs currently use a slip on the southern side of this island, but this situation has been deemed insufficient and unsafe due to the difficulty of carrying boats across uneven ground and accessing the lower reaches of the river.

It is proposed to construct a floating pontoon system within the River Liffey, accessed via a gangway and associated concrete platform that extends from the existing riverbank. Two tubular steel piles will be driven through the riverbed to support the proposed pontoon. The concrete platform will measure 5m width and 8m length. The gangway will measure 16m in length and will have a 2m overlap onto the floating pontoon. The pontoon will measure 22m length and 4m in width. The overall design will measure 44m.

The concrete platform will be constructed using a number of precast caisson structures which will be filled with clean, crushed, stone topped by a concrete deck-slab. In order to install the caissons, the existing riverbank will be locally dug-out using an excavator located on the

island¹. Rock-fill, placed against the side of the caissons and the riverbank, will provide scour protection for the edge of the concrete platform.

The works also include the removal of vegetation on the approach to the pontoon and the construction of an access walkway to transport boats between the upper and lower reaches of the River Liffey, either side of the existing weir at Islandbridge.

An existing steel footbridge, located upon the island, is to be removed in order to facilitate the construction works. The structural arrangement of the bridge also needs to be modified to accommodate proposed changes to the adjoining ground levels. The bridge shall be temporarily removed and reinstated upon completion of the other works, with an additional handrail and GRP anti-slip grating included.²

3.0 RECEIVING ENVIRONMENT

3.1 Historic Background

The area around Islandbridge has been inhabited since the Viking era, evidence of which was brought to light by the discovery of a large viking cemetery located nearby; unearthed during construction of the railway around Heuston Station (then called Kingsbridge Station) in the nineteenth century. It contained at least thirty-five (35) individuals who had been interred with swords, shields and spears, as well as trade items such as weights and balances. This discovery of a significant burial, positioned so far west of the Blackpool longphort, has led some archaeologists and historians to suggest that there may have been a second Viking longphort nearby, possibly at the confluence of the River Liffey and the River Camac (culverted under Heuston Station).³

Islandbridge has been an important fording point of the River Liffey since the Medieval era, when Kilmahonock's ford crossed the Liffey nearby Islandbridge. Kilmainham Bridge was built at this crossing in the middle of the fifteenth century, but the stone bridge was swept away by floods in 1545. In 1577, Sir Henry Sidney, Lord Deputy of Ireland, rebuilt the bridge, which spanned the river with eight stone arches. Sidney Bridge, or Islandbridge, stood for over two-hundred years.

The construction of a nearby weir in 1780 allowed for the establishment of flour mills, breweries and fisheries in the area. Liffey floods damaged the bridge to the extent that a

¹ Malone O'Regan, New Pontoon Installation at Islandbridge Construction Methodology (June 2022) p.8

² Development details extracted from Malone O'Regan, New Pontoon at Islandbridge Construction Methodology (June 2022) p.7

³ Dublin's viking warrior burials, irisharchaeology.ie (<http://irisharchaeology.ie/2011/06/dublins-viking-warrior-burials>)

replacement was deemed necessary around that time. In 1780, Parliament granted money to rebuild the bridge; however, poor management and funding issues left the replacement bridge unfinished until 1792.⁴ Its replacement, Sarah Bridge (now known as Islandbridge), still stands 320m down river of the area underassessment. These bridges had a resounding effect on the historical development of the local environment. The strategic importance of this area, as a crossing-point that controls an entrance into the city, is highlighted by the presence of a nearby fort (Magazine Fort, built 1736) and the Royal Artillery Barracks, both of which are depicted on nineteenth-century mapping of the area.

3.2 Cartographic Information

The OS 6-inch First Edition (1829-41) map of the area shows a 'Calico Printing Factory' on the southern shore, downstream of the island (Figure 3A). This is being serviced by a mill race which also serviced a flour mill located further downstream. While the construction of this weir and adjacent mill-race allowed for the construction of mills, it has been postulated by Claire Walsh that the island where this 'Flour Mill' is located has been the site of a mill since at least the twelfth century and that 'the location of the medieval mill/s was at the upper end of the mill headrace'.⁵ The OS First Edition Map also depicts 'Magazine Fort' (built 1736), on the north of the river, and the 'Royal Artillery Barracks' on the south of the river, highlighting the military importance of this river crossing.

The OS 25-inch Edition (1897-1913) map shows the 'Bellevue Maltings' to still be operational along with the mill-race (Figure 3B). The 'Boat Club' has become the 'University Boat Club'. Two trenches were dug at the extremities of an extension that was proposed for the boat house still standing in this location in October of 2000; both trenches revealed only sod and topsoil overlying natural boulder-clay.⁶

The OS 6-inch Last Edition (early twentieth century) map of the area shows the Calico Printing Factory to have been replaced by 'Bellevue Maltings'. The Magazine Fort no longer exists, and the Royal Artillery Barracks have been renamed 'Clancy Barracks', reflecting the post-independence era in which it was made. A 'Boat Club' is shown on the southern side of the river, just upstream of the weir and 'Rowing Clubs' are indicated further upstream on the northern side of the river, suggesting the rich history of rowing along this part of the river.

⁴ Bridges of Dublin, History of Island Bridge (<http://www.bridgesofdublin.ie/bridges/island-bridge/history>) [accessed: 14/4/23].

⁵ Entry 2002:0600, Claire Walsh, 765 South Circular Road, Islandbridge, Dublin, license number 02E14710.

⁶ Entry 2000: 0304, Ian Doyle, Margaret Gowen and Company. Ltd, University of Dublin Boat Club, Inchicore, Islandbridge, license number 00E0271.

3.3 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, 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.

Six (6) RMP sites are listed within a 300m radius of the impact area of the proposed development. These comprise of a bridge site, Kilmainham Bridge (mid-fifteenth century – 1545) which was replaced by Sidney Bridge (1577-1770s) (DU01208), the site of two water mills (DU03690 and DU01210)), a mill (DU03388), and a seventeenth-century house, ‘the Phoenix House’ (DU00978); later becoming a bastioned fort, ‘the Magazine Fort’ (DU00984) (Figure 3/A-B).

RMP Number	ITM	Townland	Site Type	Proximity to Impact Area
DU01208	712583E, 734341N	Dublin South City	Bridge	260m east
DU03690	712569E, 734298N	Dublin South City	Watermill	245m east
DU01210	712599E, 734294N	Dublin South City	Watermill	280m east
DU03388	712600E, 734270N	Dublin South City	Mill	280m east
DU00978	712104E, 734488N	St. James	Seventeenth-century house	250m northwest
DU00984	712092E, 734498N	St. James	Bastion fort	250m northwest

Table 1: Known sites and monuments listed in the RMP within a 300m radius of the impact area of the proposed rowing pontoon development.

3.4 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 nation’s 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).

There are five (5) NIAH sites that are listed within a 50m radius of the impact area of the proposed rowing pontoon development (Table 2, Figure 3 A/B).

NIAH Number	ITM	Description [Rating]	Proximity to Impact Area
50060657	712268E, 734351N	Detached three-bay two-storey house, built c.1870 (Regional rating)	20m northwest

NIAH Number	ITM	Description [Rating]	Proximity to Impact Area
50080003	712343E, 734305N	Freestanding octagonal-plan two-stage folly tower, built c.1870 (Regional rating)	50m east
50060326	712204E, 734228N	Diagonal-plan weir structure, built c.1780 (Regional rating)	Partly within impact area
50080004	712402E, 734236N	Mill race from River Liffey, built c.1770 (Regional rating)	Partly within impact area
50080002	712229E, 734169N	Detached three-bay two-storey boat clubhouse, built 1898 (Regional rating)	50m southwest

Table 2: Sites listed in the NIAH within a 50m radius of the impact area of the proposed rowing pontoon development.

3.5 Topographic Archive

The National Museum of Ireland (MNI) 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.

There are no entries within the NMI topographic files relating to the area under development.

3.6 Excavations Bulletin

The excavations bulletin provides an annual published and online summary of accounts of archaeological excavations undertaken throughout Ireland.⁷ Summaries may also be submitted for inter-tidal survey, underwater assessments, and the archaeological monitoring of marine/ riverine dredging works. The majority of the entries relate to development-led archaeological work. There are no entries for the riverine area under direct assessment.

There have been a number of entries for the areas in the vicinity of the development area. During the 19th and 20th centuries, Viking Age material was recovered from the Kilmainham/Islandbridge area, including a large Viking cemetery. Further remains were

⁷ Isabel Bennett (ed.) *Excavations Bulletin: Summary Accounts of Archaeological Excavations in Ireland*, Wordwell Ltd.; accessed online via www.excavations.ie.

discovered when the War Memorial Park was laid out in the 1930s. Additional material is described as having derived from 'The King's Ford', which was 'just above the weir at Dublin University Boat Club, Islandbridge', Dublin.⁸

A more recent discovery that connects the immediate area of the proposed development with this Viking heritage can be seen with the discovery of an iron sword and spearhead, both of Scandinavian type, during the excavation of a trench in the War Memorial Gardens at Island Bridge (ITM 712519E, 734193N). These artefacts were part of a burial that, although it had been disturbed by the construction of a wall, contained some *in situ* inhumated remains including a vertebral column, one femur and ribs with a nearby copper-alloy, plain-ringed, loop-headed pin.⁹ The discovery of this burial, only 250m to the southeast of the area under assessment alludes to the archaeological potential present for the wider area.

An extension to the Old Coach House on Chapelizod Road, Islandbridge required archaeological monitoring due to its proximity to the possible site of the early historic fording point of the River Liffey, known as 'King's Ford'. The process of piling, however, allowed no visual observation of possible archaeological features and so, none were therefore recorded. This is the closest archaeological monitoring to the area under investigation that has taken place as it lies on the northern bank of the River Liffey. To date, there has been no archaeological investigation within the adjoining river area; the current assessment constituting the first of such endeavours.

While there has been no previous underwater assessment of the river, material of a maritime/underwater archaeological nature was found in the vicinity of the waterway. A post-and-wattle fishtrap was discovered between two substantial walls of post-medieval date in a rebuilt section of the millrace. The dating of the fishtrap is certain, as it is built up against a wall of probable late 18th-century date, and several sherds of glazed blackware (late 18thth - early 19thth century) were recovered from the fill. The northern wall probably dates from the establishment of a printworks on the island in 1786, while the southern wall dates at least from the construction of the main mill buildings and Islandbridge House between 1801 and 1837. It is thought that the trap may have been used for catching eels¹⁰ This stretch of the River Liffey was a known fishing area at the fish-traps discovery indicates the type of archaeological features that are likely to be present. An example of the local history of fishing within the area is that in February 1792, before the opening of the new Sarah Bridge, the public was informed of their last opportunity to buy fresh salmon as it was necessary to close

⁸ O'Brien 1998, 216 in Entry 2000: 0304, Ian Doyle, Margaret Gowen and Co. Ltd., University of Dublin Boat Club, Inchicore, Islandbridge, license number: 00E0271..

⁹ Entry 2008: 467, Maeve Sikora, War Memorial Gardens, Islandbridge, license number: 08E0693.

¹⁰ Entry 2001:432, Claire Walsh, Mill Island, Islandbridge, Dublin, license number: 99E0674. ie

some of the Islandbridge fisheries.¹¹ Some fisheries were still operational shortly afterwards as can be seen by the 'Fish House' on a survey map from 1801 (Plate 1).

The only works that have been conducted along the river was a programme of archaeological monitoring that was undertaken in association with emergency repair works to the River Liffey wall at Bellevue, Islandbridge, Dublin 8, in June 2020. However, no archaeological features or deposits were encountered during this programme of archaeological monitoring.¹²

3.7 Shipwreck Inventory

The Historic Shipwreck Inventory maintained by the DHLGH 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. 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.

There are no wrecking events listed for the specific area under assessment.

3.8 Conclusion

Islandbridge has been a populated riverine environment since the Viking Age with special importance as a crossing point of the River Liffey. This importance was solidified by the construction of a series of stone bridges that spanned the river; the construction of Sarah Bridge (Islandbridge) and the nearby weir in the 1780s instigating major development within the area. In addition, industrial period developments, such as mills and fish houses, are also clearly evident when viewing the available historic mapping for the area.

4.0 SURVEY METHODOLOGY

A visual survey/impact assessment was carried out across the footprint of the proposed development, which included adjoin pathways and temporary bridges, as well as the location of the rowing pontoon itself. The area encompassed the southern riverbank upstream of the

¹¹ Bridges of Dublin, History of Island Bridge (<http://www.bridgesofdublin.ie/bridges/island-bridge/history> [accessed: 14/4/23].

¹² Entry 2020:526, James Hession, Bellevue, Islandbridge, Dublin, license number: 20E0265.

weir, the mill-race created by that weir, the weir itself, the island that is the focal point of the development, its western riverbank and river channel; the survey extending between the ITM 712282E, 734217N (upstream) - ITM 712300E, 734339N (downstream) (Figure 4).

A non-disturbance visual survey was carried out across this area and included both terrestrial and underwater components, as detailed below:

- Systematic walking/wade survey was carried out, across the island and adjoining weir area.
- Underwater assessment of riverbed located along the western side of the island, encompassing the in-river footprint of the proposed development; the survey area extending to encompass a c. 100m-long section of the river channel.

This underwater survey was carried out by a five (5) man, archaeological, dive-team. The area was surveyed in a methodical manner, starting upstream towards the weir's base, then and crossing back and forth across the width of the survey area while moving slowly downstream. Three (3) divers performed this survey pattern during three (3) separate, staggered, two-hour dives. This resulted in the survey area receiving considerable overlap and ensuring maximum coverage. This survey pattern minimised the effects of current on the diver and maximised riverbed coverage. Material found resting on the riverbed that had the potential to inform the UAIA of the survey area was recovered to the surface for further inspection. However, none of this material was deemed to be of archaeological/historical value. After a photographic record was taken, these were redeposited into the river. A detailed account of observations was transcribed after the dives took place and a photographic record was taken to compliment this record. The ensuing visual survey and assessment section of this report will follow this general survey pattern to help the reader visualise where in the river each find or observation was made. It should be noted, however, that due to the highly dynamic nature of this river channel, most of these finds and observations are not *in situ* but are redeposited items.

The resulting archaeological assessment describes the riverbed topography present, assesses the nature of the riverbed deposits to retain material of archaeological potential, and includes an archaeological survey of finds, features and structures that were identified both in-water and adjacent to the river area. Particular attention was paid to the underwater environment, with detailed descriptions of the riverbed topography and riverbank environment being made. All archaeological features encountered, whether actual or potential were described, photographed and measured. No finds warranted conservation and were re-deposited into the river.

In addition, a targeted metal detection survey was employed underwater to assist in the identification of metallic objects across sample areas; highlighting any material concentrations present. All metal-detection hits were logged and, where possible, non-intrusive investigation

took place to identify the types of material present. A finds retrieval strategy dealing with conservation issues, cataloguing, and locational recording was in place to deal with any artefacts recovered during the survey. However, no finds were deemed of archaeological value and so, were not retrieved.

5.0 ARCHAEOLOGICAL ASSESSMENT

5.1 Topography

The topography of the area under assessment is that of a dynamic riverine environment. The survey area encompasses the southern riverbank upstream of the weir, the mill race created by that weir, the weir itself, the island downstream of the weir and the river channel that runs between it and another small island within the River Liffey. The aforementioned weir has had a significant effect on the surrounding topography and must be taken into account when assessing the riverbed and the dispersal of debris present.

The weir and adjoining mill race on the southern shoreline of the River Liffey have affected the topography of the riverbed in the location of where a temporary access bridge is proposed to be built. The riverbed consists of compact silty sand (40% 60% mix) with frequent pebble and gravel inclusions and infrequent cobbles. There is heavy tree branch and leaf litter present as it acts as a catchment area for debris not carried over the weir. The riverbed slopes from the weir at a 30-degree angle for approximately 5m until it reaches its maximum depth of 1.25m. At this central point, the riverbed has been a build-up of silt and leaf litter, allowing for the establishment of a reed-bed (Plate 2).

The riverbed between the two islands downstream of the weir is composed of a gravelly sand (40% 60% mix) interspersed with pebbles, cobbles, and frequent boulders (Plate 3). The riverbed is composed of gravelly sand (with 5-10mm of penetration depth) towards the riverbanks, but as the riverbed becomes deeper, the frequency and density of pebbles, cobbles, and boulders increases until the gravelly sand bottom is completely covered (Plates 4-5). This riverbed material retains a good holding-content and the potential to preserve items (Plate 6). The riverbed slope has a 20-degree gradient until it reaches a maximum depth of 3m (at high tide) in the centre of the river channel.

Siltation is active along the east side of the river channel, this deposition being caused by the weir upstream (Plate 7). A scour pool (1m deeper than the surrounding riverbed) has formed on the western side of the river channel; localised to the area around the base of the weir. This part of the riverbed retains higher frequency of large boulders (300mm x 300mm x 300mm on average) as well as aquatic vegetation (riverweed, etc.) that has anchored itself onto these boulders (Plate 8).

At the propped river impact location, the riverbank is comprised of topsoil and vegetation (above the high-water mark), sitting upon a clay bank (Plate 9). Considerable undercutting of the bank structure was observed (500mm height and 700mm in depth) before it meets with the gravelly sand riverbed previously described (Plate 10). This bankside undercutting appears to run the length of the proposed rowing pontoon, although visual confirmation was obstructed by a number of large, felled tree trunks that lay across the riverbed at the northwest side of the island (Plate 11).

5.2 Visual Survey and Assessment

The visual survey and assessment allowed for comprehensive coverage of the survey area and the resulting observations are presented below.

Upstream of the weir, the riverbank drops at a steep (50-degree) gradient until its vegetation meets with the waterline. This section of the riverbank is near the beginning of the old mill race and has the potential to hold artefacts and/or features related to this element of the riverine landscape (Plate 12). The Construction Methodology states that ‘Some excavation and regrading of the existing riverbank on the southern side of the river will be required in order that construction vehicles can access the temporary causeway and that it is to be built in this section of the river with pre-filled stone gabions or rock-filled bags lowered into place.’¹³ While the pre-filled stone gabions should have minimal impact on any potential archaeological material held within the riverbed, the excavation of the riverbank has the potential to disturb buried archaeological features.

The downstream face of the weir is constructed from angular limestone of various shapes and sizes (between 100mm x 100mm and 300mm x 300mm approximately) and exhibits a 40-degree gradient until its crest. This crest is marked by a sill constructed out of rectangular limestone blocks; varying between 700mm and 1.3m in length, with a uniform width of 270mm that are laid laterally (Plates 13-14). These sill blocks are likely the top of a back wall of the weir. The weir was built with a ramp against the upstream face of this back wall. This ramp shows facing stones that vary in shape and size between squares of 200mm x 200mm and rectangles of 300mm x 120mm. These are also laid laterally in line with the weir (Plate 15). This is relatively uncommon in weir construction as natural sediment build-up against the structure’s back-wall would often be anticipated to serve the same purpose.

There has been a modern addition to the weir, where the temporary access bridge is to be located; *hessian* sacks filled with concrete having been laid on the upstream ramp of the weir, across its eastern section, to form a slipway that provides access to the upper river area (see

¹³ Malone O’Regan, New Pontoon Installation at Islandbridge Construction Methodology (June 2022) p.5

Plate 1). This has raised the local structure and prevented water passing over it. The concrete-filled sacks were stacked to form a relatively level surface so that they stand 200mm above the sill and 400mm above the ramp's upstream side (due that ramps 40-degree gradient). The heightening of the weir with this upper slipway has provided a wide dry section that allows for a crossing point where the existing footbridge begins (Plate 16).

A flow control sluice-gate is located on the east side of the weir (Plate 17). The wooden gate and iron mechanism present suggest a mid-twentieth century construction date (Plate 18). However, it stands at the point where a sluice gate has existed since at least the 1840s, as indicated on the OS 25-inch Edition map. Evidence of previous sluice gates is present in this feature. It sits within a stone-built passage that cuts through the easternmost edge of the weir and the stone-built revetment of the eastern riverbank (Plate 19). This stone-built passage may be contemporary with the rest of the weir. One section which is not contemporary is the rectangular blocks that have been stacked and mortared one on top of the other to fill a vertical recess (280mm wide) within either side of the stone walls of the sluice gate passage (Plate 20). This vertical recess would have been the anchor point for the timber post of a previous sluice gate. A concrete flooring has been built downstream of this 1960s sluice gate. Limestone blocks can be seen underneath this concrete. These may be the stone apron of the original sluice gate as they are integrated with the bottom shelf of the weir. A modern I-beam and a fragment of an oak plank lay within this sluice gate passage and may be debris from repair works (Plate 21).

The bottom shelf of the weir has a shallower gradient (c. 20-degrees) than that of its main body. There is evidence of a timber baffle having existed across the bottom of the weir. This baffle was identified in the river channel between the island and the eastern shoreline of the waterway. It was only visibly extant for a short time during the apex of a Low Tide. It survives to a length of 3.3m until disappearing under vegetation growth on the island. The baffle was constructed from box-cut timber measuring 250mm width and 200mm depth, with 260mm-long, rectangular teeth formed by uniform rectangular notches measuring 100mm depth and 200mm length. Most of the teeth only survive to a height of 50mm, having been eroded down by the action of the river. The purpose of this baffle was to break up the flow of the river at the base of the weir and weaken its hydrodynamic force. It may, therefore, have existed across the length of the weir to prevent scouring and undermining of the base of the weir. This baffle exists within close proximity of the existing footbridge, which is to be removed for a temporary bridge to replace it (Plate 22).

The dive survey of the riverine footprint of the proposed rowing pontoon resulted in comprehensive underwater archaeological assessment of the riverbed. It showed that the

riverbed exhibits a high potential to retain debris as well as archaeological material. The finds and observations encountered during this survey will be detailed below.

A modern bike frame found partially exposed 1m southwest of the proposed caisson base of the rowing pontoon showed how debris can become caught and quickly buried by riverbed material. A racing bike handle found 2m south of the proposed caisson base of the rowing pontoon and a children's bike found 3m west of it reinforced this observation of the riverbed's ability to catch, bury, and retain material.

This propensity to catch and hold material stands true for older material that would be of archaeological value. This observation is highlighted by the identification of various ceramic, bone, metal and glass objects found throughout the survey area (Plates 23-27). These finds dated from the twentieth century with older material presumably remaining buried at depth within the riverbed deposits.

Ceramic fragments encountered as part of the underwater survey predominantly dated to the twentieth century. The majority of the assemblage comprised fragments of utilitarian whiteware with minimal decoration. The exception to this is two (2) small, body fragments of blue willow-pattern whiteware, one (1) handle fragment of creamware (with a sculpted and painted green leaf decoration), and one (1) base fragment of whiteware with a painted brown floral decoration (Plate 23).

One (1) metal strap stamped 'AYLINGS PATENT BUTTONS' with three fastenings was identified on the riverbed 2m west of the caisson base for the pontoon (Plate 24).

Four (4) complete glass bottles and two (2) bottle neck fragments were found in total. The one (1) rectangular of the four (4) complete bottles may date from the first-half of the twentieth century, with the other three (3), as well as the two (2) neck fragments, dating to the second-half of the twentieth century (Plates 25-27).

The capacity for the river current to move pebbles, cobbles, and boulders was illustrated by the presence of four (4) angular limestone boulders (500mm x 400mm x 400mm on average) located in the middle of the river channel, at a point 4m northwest of the proposed caisson base of the rowing pontoon. These were the same type as those seen around the base of the weir, having been relocated during floodwater events. The shape and size of these limestone boulders indicate that they may have broken off from the base of the weir.

A timber trunk was identified lying east-west at a point 2m southwest of the caisson base of the rowing pontoon. Unlike the other felled tree-trunks identified further downstream, this

timber had a flat surface as if milled into a plank. However, its underside was rounded, giving it the profile of a half-split log. The flattening of this timber's upper surface may have been caused by river erosion rather than it having been milled. Nevertheless, it showed no signs of fastenings and did not appear to be a component of any present structure or feature (Plate 28).

A number of bone pieces were identified throughout the survey area. A cow jawbone and a section of cow's teeth were found underneath where the gangway will connect the caissons (Plate 29). A range of other animal bones were also scattered throughout the survey area.

There were three (3) metal pot handles found strewn across the riverbed, located in close proximity to the proposed river impact area. One was found where the north-western corner of the caisson base will be situated. It had a base measurement of 370mm, indicating the diameter of the pot or bucket it was once connected to. A half fragment of an iron pot handle was encountered 2m south of the proposed caisson base of the rowing pontoon (Plate 30). It had an approximate base measurement of 300mm. Another iron pot handle was encountered 3m north-west of this caisson base. It exhibited a base measurement of 170mm (Plate 31). The style and material of these pot handles place their manufacture around the mid-twentieth century.

Larger modern material was encountered in the river channel, indicating the strength of water-flow over the weir. Two (2) tractor wheels were identified in the middle of the river towards the end of the proposed floating rowing pontoon (Plate 32). These lay several metres apart, with one being considerably more buried by riverbed material than the other. A 2m length of metal L-beam rested diagonally between these two tractor tires. The size and weight of these objects suggest the capacity of the river to move objects to this location, as well as to hold and bury those objects.

Several recently felled trees blocked much of the riverbed at the north-eastern extent of the survey area. A total of three (3) trees (with numerous projecting branches) prevented diving along the riverbank of the very north-western extremity of the island. However, this section of the survey area was beyond the footprint of the rowing pontoon.

5.3 Metal-detection Survey

The riverbed was heavily contaminated with modern rubbish mainly comprising of plastic bottles, containers, aluminium tin cans and glass spirit bottles, most of which were likely deposited in this area by the river current. There was also a mixture of general discarded rubbish. Visible targets included aluminium drinks, cans, bottle tops, tin cans, bike frames, reinforcing-bar pieces and pot handles.

No finds of archaeological/historical significance were encountered as part of the metal detection survey.

5.4 Conclusion

The visual survey was systematic and comprehensive, extending well beyond the boundaries of any primary or secondary impacts arising from the installation of the proposed rowing pontoon and related structures. The weir, including its adjoining sluice gate and baffle, are of industrial archaeological interest. The weir has greatly affected the riverine environment that was assessed within the underwater survey area. This survey found that the riverbed exhibits a high capacity for catching, holding, and burying material of various shapes and sizes. Although nothing from before the twentieth century was encountered on the riverbed surface, this river action would suggest that older material of archaeological value could lie beneath the current riverbed level.

6.0 PROPOSED IMPACTS¹⁴

A number of proposed impacts of the development have been detailed below, a number of which will require construction phase mitigation, as detailed in Section 7.0.

The pre-filled stone gabions for the temporary river crossing, extending from the southern shore to weir itself represents a minimal impact to the riverbed. However, the excavation of the riverbank for that crossing has the potential to directly, negatively impact unknown features of archaeological and/or historical significance that may be present. In addition, the removal of the concrete-filled hessian sacks, which have been laid onto the weir ramp to form a slip, has the potential to remove underlying stonework from the weir.

The existing footbridge, that is to be temporarily removed, is supported by concrete foundations built directly onto the weir's stonework (Plate 33). The construction of the replacement to this bridge has been designed to be supported off these concrete foundations and, therefore, poses no new impact to the weir's stonework.¹⁵

Two (2) tubular steel piles will secure the floating pontoon and represent a direct, but localised, impact to the riverbed.

It is understood that minimal excavation is required as part of the proposed development, being limited to the installation of the caisson structure.

¹⁴ 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.

¹⁵ Malone O'Regan, New Pontoon Installation at Islandbridge Construction Methodology (June 2022) p.7

6.1 Impact Categories

Impact/effect categories will typically have regard to those set out in the '*Guidelines on the information to be contained in Environmental Impact Statements*', 2022, EPA; '*Advice notes on Current Practice (in preparation of Environmental Impact Statements)*', 2003, EPA; *Strategic Environmental Assessment (SEA)*, 2010; and *Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes*, no date, National Roads Authority.

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 are 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.

Potential impacts associated with the proposed development and corresponding impact classifications have been tabulated in Table 6 below. There are no impacts (primary or secondary) to any known archaeological material, deposits, or features arising from the proposed works.

Proposed works	Location/ITM	Potential Impacts	Classification of Impact
Removal of concrete sacks.	Surface of ramp of weir. ITM 712292E, 734239N	Possible impact to weir's stonework.	Potential for indirect, negative, impacts to weir stonework; slight in nature.
Stone gabions for temporary river crossing.	Extending from southern riverbank to weir. ITM 712292E, 734238N	Potential to impact archaeological features that may remain buried within riverbed.	No impact to any known features of archaeological significance; moderate in nature.
Ground disturbance works of riverbank for temporary river crossing.	Section of southern riverbank. ITM 712303E, 734219N	Potential to impact archaeological features that may remain buried within riverbank.	Potential for direct, negative, impact to unknown features; moderate in nature.
Removal and replacement of existing footbridge.	Between weir and island. ITM 712297E, 734244N	Not anticipated.	None.
Removal of riverbed; installation of caisson.	c. 8m x c. 5m section of riverbed along western riverbank of island.	Potential to impact archaeological artefacts/features that may be buried within	Potential for direct, negative, impact to unknown features of archaeological significance;

Proposed works	Location/ITM	Potential Impacts	Classification of Impact
	ITM 712275E, 734275N	riverbank.	moderate in nature.
Tubular steel piles to secure floating pontoon.	Two (2) points along western riverbed/bank of island. ITM 712284E, 734296N	Potential to impact archaeological artefacts/features that may be buried within riverbed/bank.	No impact to any known features of archaeological significance.

Table 3: Nature and classification of riverine impacts arising from the proposed development.

7.0 RECOMMENDATIONS

7.1 Pre-construction Measures

No further ameliorative measures are recommended in advance of construction works taking place. However, a number of construction phase mitigation measures are required, as detailed below in Section 7.2.

7.2 Construction Phase Measures

Given the developments proximity to an eighteenth-century Weir (NIAH 5006026) and the potential for existing ground levels/riverbed to retain buried features relating the river's historic use (as detailed in Section 3.0) a number of construction phase mitigation measures have been considered and identified for the proposed pontoon development. This includes Archaeological Monitoring of the following construction items:

- Installation of a temporary access bridge to ensure no impact to the historic elements of the weir structure.
- Excavation/removal of any bankside deposits (regrading of southern bank) required as part of the installation of a temporary access bridge.
- Excavation of the riverbed/bank structure associated with installation of a caisson landing area for the floating pontoon.

The archaeological monitoring is to be carried out by a suitable qualified archaeologist with suitable experience in riverine archaeology. 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 Rowing Pontoon, River Liffey, Islandbridge, Co. Dublin. Should any alteration occur, further assessment maybe required.

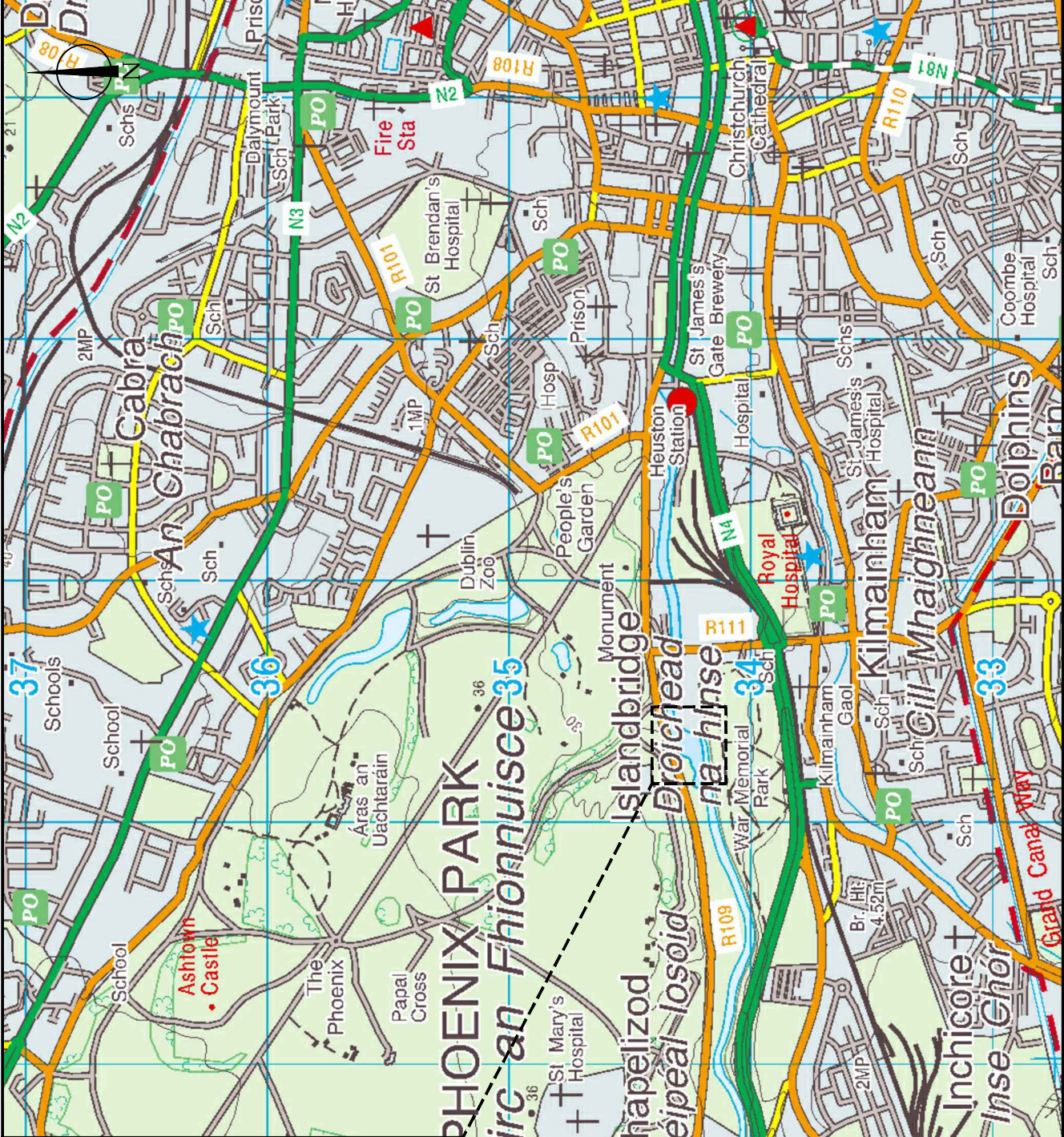
PLEASE NOTE: Recommendations are subject to the approval of The Department of Housing, Local Government, and Heritage and the National Museum of Ireland.

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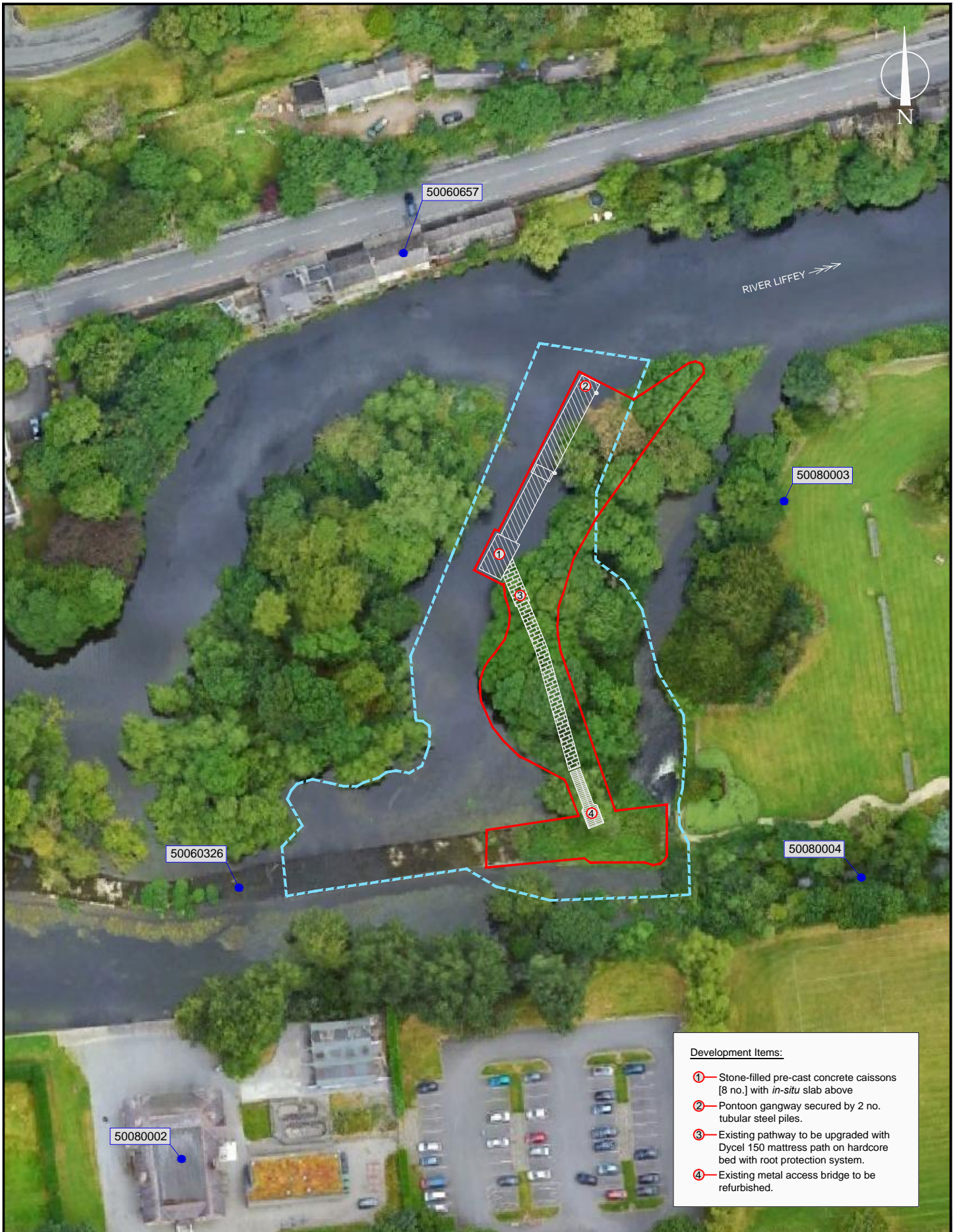
8.0 ACKNOWLEDGEMENTS

Thanks are extended to James Hession (Associate Director) Rubicon Heritage, Christina Dowling (Project Manager) DCC, and Malone O'Regan (Consulting Engineers) for their assistance with the project. The Survey Team comprised Rex Bangerter (Senior Archaeologist), Matthew Conway (Project Archaeologist), Brian McAllister (Dive Supervisor), Ultan O'Shea (Commercial Diver), Liam O'Shea (Tender/ Coxswain). The report was written by Conway and edited by Bangerter. The reports figures were produced by Bangerter.



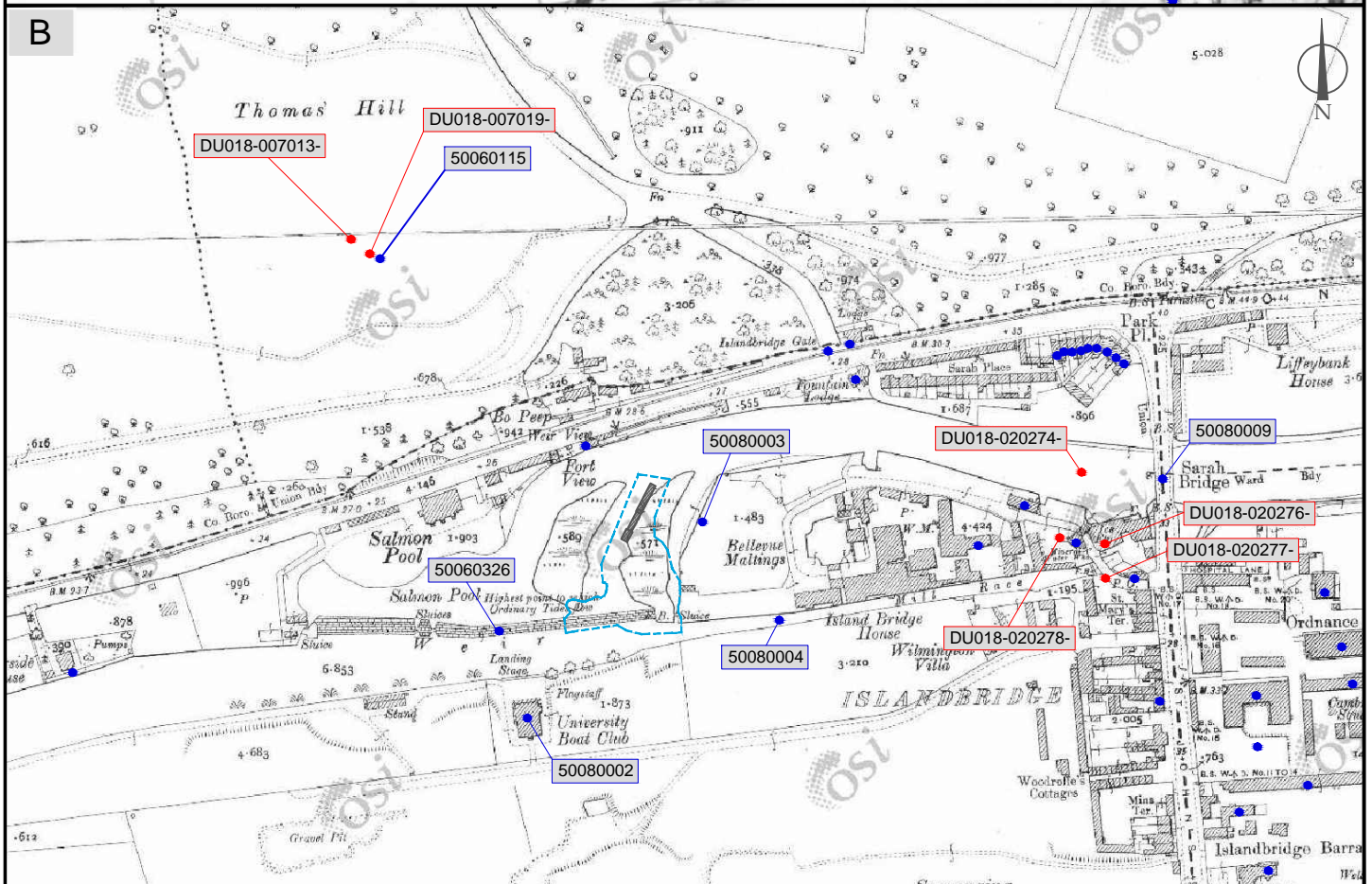
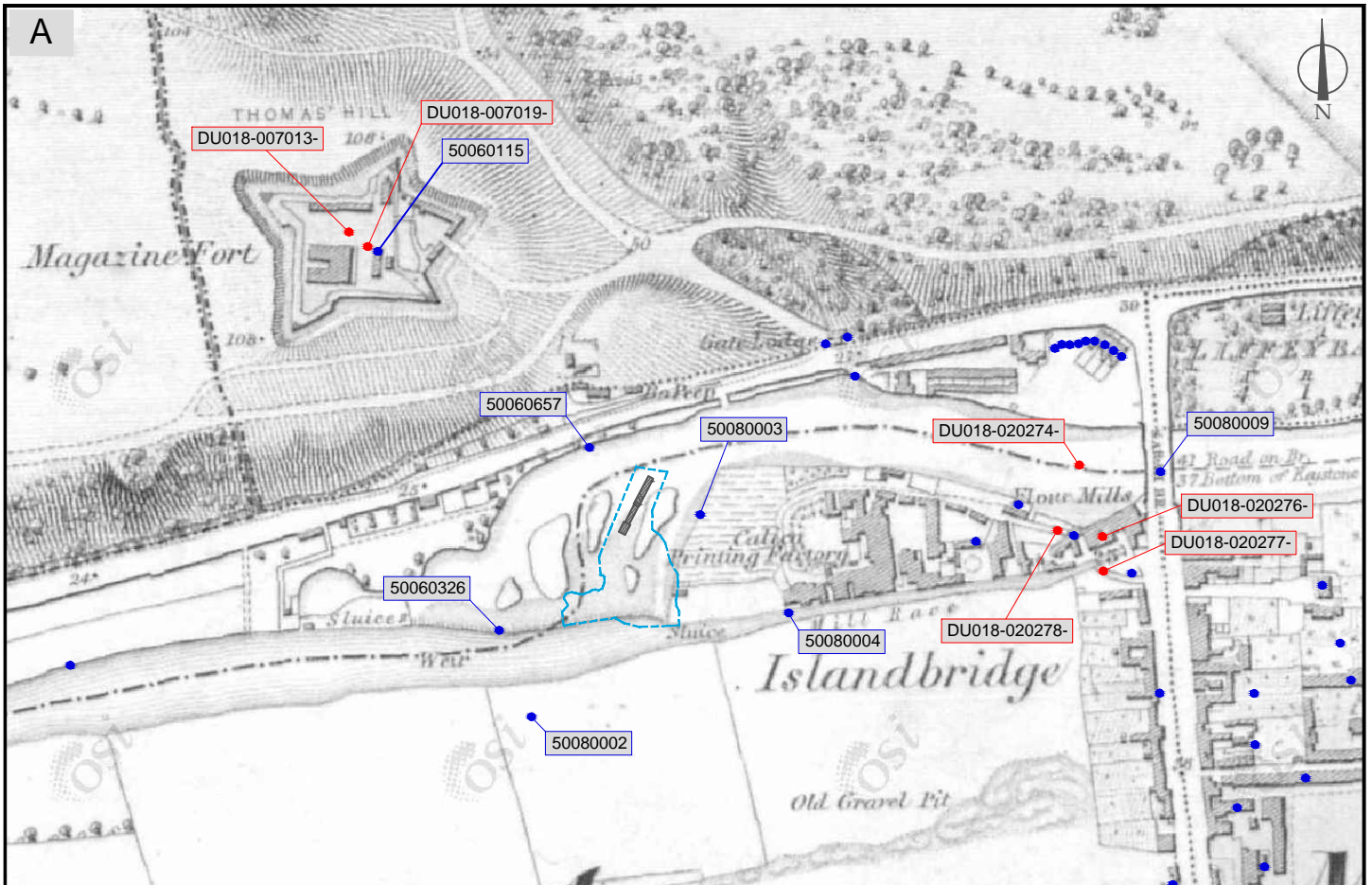
Notes Source: Main- OS Discovery Series Mapping Thumbnail: Google Earth (satellite image captured July 2022).		Job/Exc. No. 23DD0020		Completed by R. Bangertler		CAD reference Islandbridge_Dublin		Client Rubicon Heritage/ Dublin City Council		Title Figure 1- OS Discovery Series map and satellite image showing location of proposed Rowing Pontoon, Islandbridge, Dublin.	
A4		Date 10.05.23		Scale 1:25,000/1:2500		Drawing No. Figure 1		Project UAIA, Rowing Pontoon, River Liffey, Islandbridge			





- Development Items:**
- ① Stone-filled pre-cast concrete caissons [8 no.] with *in-situ* slab above
 - ② Pontoon gangway secured by 2 no. tubular steel piles.
 - ③ Existing pathway to be upgraded with Dycel 150 mattress path on hardcore bed with root protection system.
 - ④ Existing metal access bridge to be refurbished.

	Notes Source: Google Satellite Image [captured July 2022]	Key — Application Redline Boundary - - - ADCO Survey Area Proposed Rowing Pontoon and adjoining features	A4	Title Figure 2- Aerial Image of Assessment Area with Proposed Development, ADCO Survey Area, and nearby Cultural Heritage Assets superimposed.			
	Client Rubicon Heritage/ Dublin City Council	Project UAIA, Rowing Pontoon, River Liffey, Islandbridge	Job/Exc No. 23D0020	Compiled by R.Bangertner	CAD reference Islandbridge_Dublin	Date 10.05.23	Scale 1:1000



ADCO

Client
Rubicon Heritage/ Dublin City Council

Notes

Source: OSi Historic Map Archive

OSi **Ordnance Survey**
Ireland

Key

- Site listed in the RMP
- Site listed in the NIAH
- Proposed Pontoon
- ▭ ADCO Survey Area

A4 **Title**

Figure 3- ADCO Survey Area and nearby Cultural Heritage sites superimposed upon:
A). OS First Edition (1829-1841) Map.
B). OS 25-ich Edition (1897-1913) Map.

Project UAIA, Rowing Pontoon, River Liffey, Islandbridge

Job/Exc No. 23D0020

Compiled by R. Bangarter

CAD reference Islandbridge_Dublin

Date 10.05.23

Scale 1:5000

Drawing No. Figure 3



- Boulder/cobble deposit forming bed on downstream side of weir.
- Area of concentrated riverweed.
- Catchment area for water-bourne debris.
- Juvenile reedbed

- 1- Jaw Bone (Bovine)
- 2- Iron Pot-handle
- 3- Kid's Bicycle
- 4- Bicycle handle-bar
- 5- Animal Bone (Bovine)
- 6- Animal Bone (Bovine)
- 7- Animal Bone (Bovine)
- 8- Iron Pot-handle
- 9- Iron Pot-handle



Notes
Source: Google Satellite Image [captured July 2022]

Key
 ADCO Survey Area
 Proposed Floating Pontoon

A4 Title
Figure 4- Aerial Image of Assessment Area with ADCO Survey Observations superimposed.

Client
Rubicon Heritage/ Dublin City Council

Project
UAIA, Rowing Pontoon, River Liffey, Islandbridge

Job/Exc No.
23D0020

Compiled by
R.Bangertner

CAD reference
Islandbridge_Dublin

Date
15.05.23

Scale
1:750

Drawing No.
Figure 4

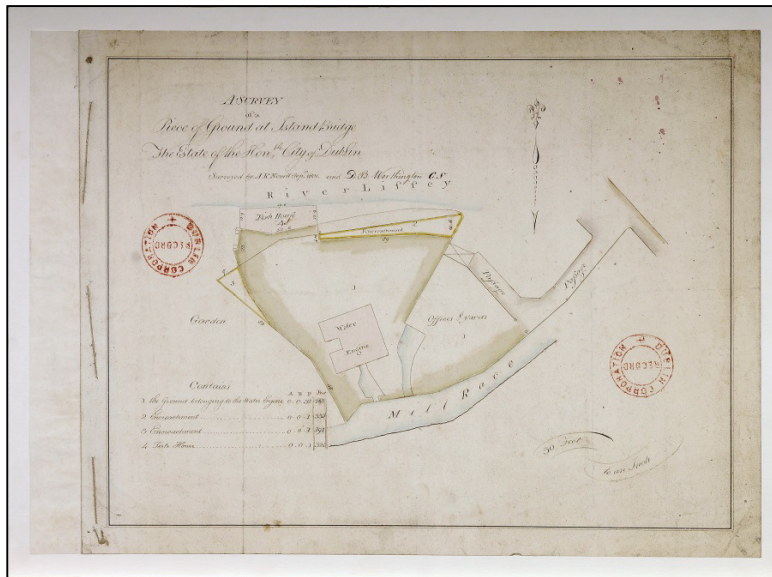


Plate 1: Copy of 'A Survey of a Piece of Ground at Islandbridge' surveyed by A. R. Nevill Sept. 1801, courtesy of the National Library of Ireland.

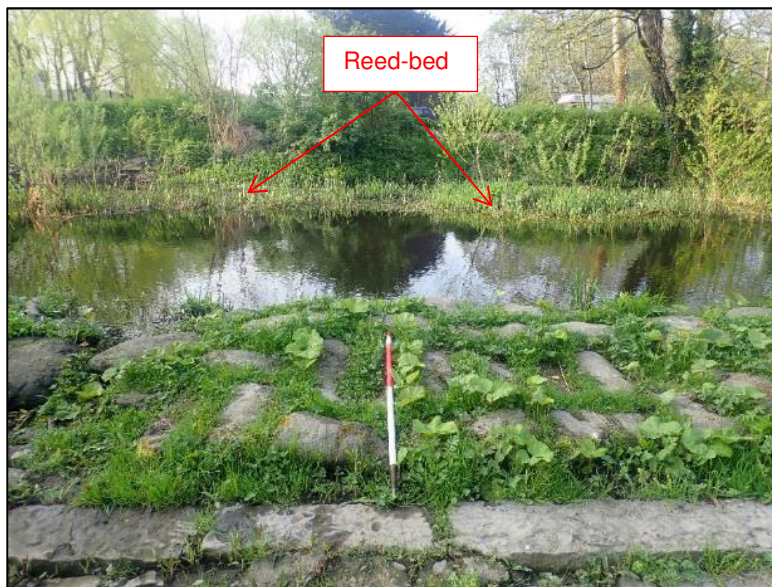


Plate 2: Southern riverbank of Liffey across from mill race created by the weir, showing hessian sack slipway.



Plate 3: Gravelly sand (40% 60% mix) riverbed material (150mm scale).



Plate 4: Gravelly sand (50% 50% mix) riverbed material with higher density of pebbles and cobbles towards middle of the river (150mm scale).

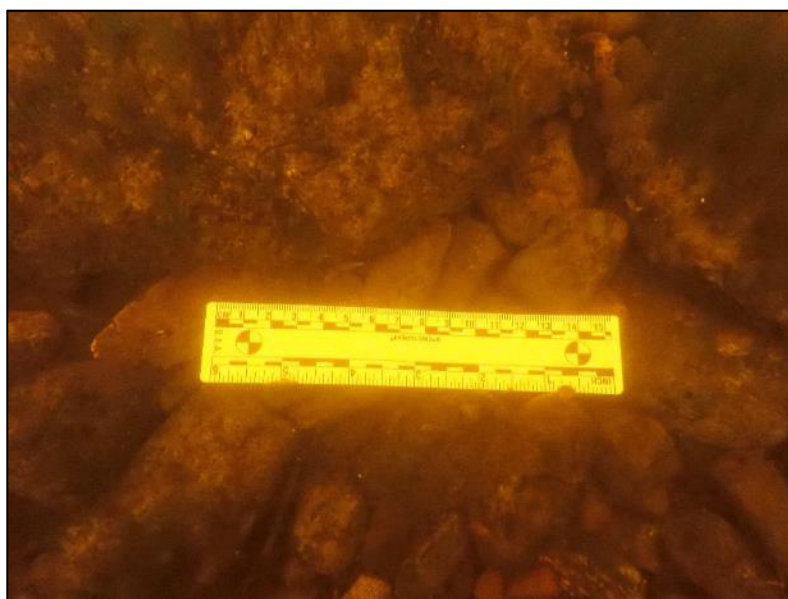


Plate 5: Pebble and cobble riverbed material with infrequent boulders at middle point of the river (150mm scale).



Plate 6: Ceramic base held within the riverbed material (150mm scale).

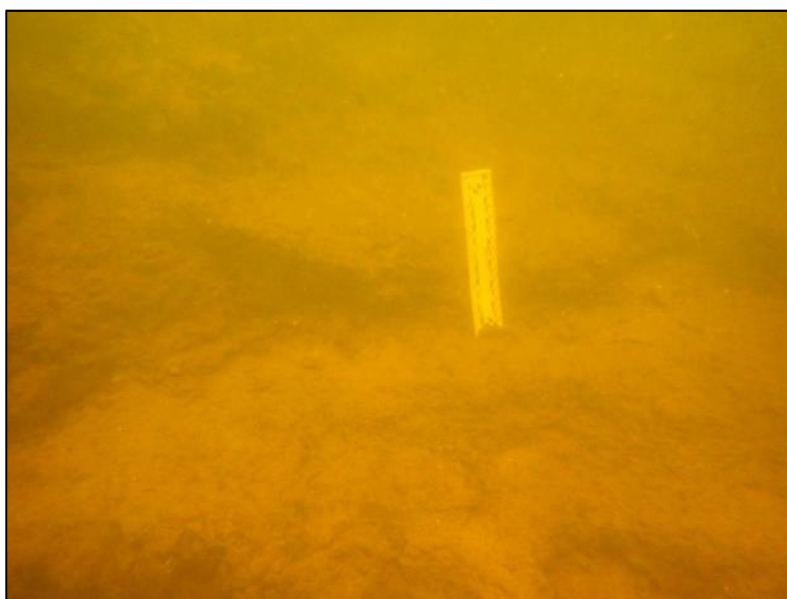


Plate 7: Silt build-up on eastern side of riverbed (150mm scale).



Plate 8: Riverweed coverage on boulders around the base of the weir.



Plate 9: Riverbank at location of proposed rowing pontoon.

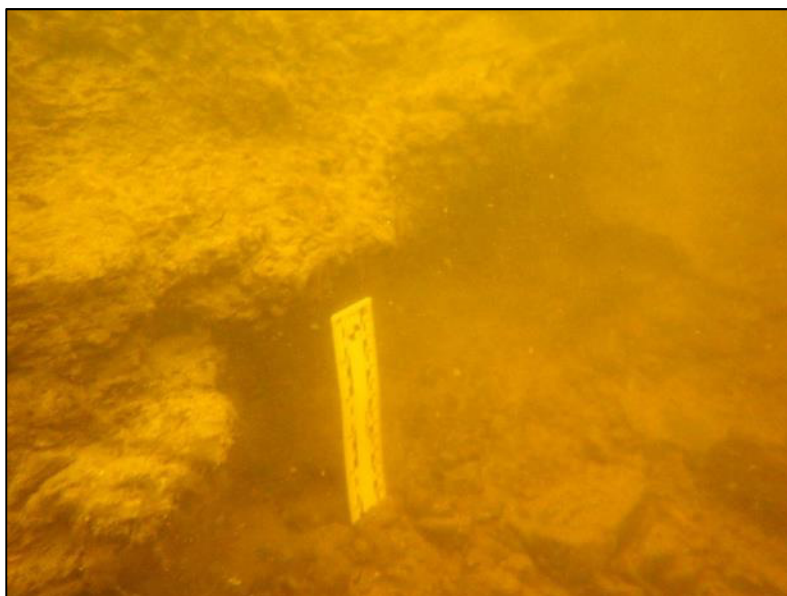


Plate 10: Beginning of undercutting beneath eastern riverbank (150mm scale).



Plate 11: Felled tree trunk lying across riverbed.



Plate 12: Beginning of mill race.



Plate 13: West facing overview of the weir from beginning of mill race.



Plate 14: Weir (left) and weir sill (centre) with hessian sacks (right) (1m/ 150mm scales).



Plate 15: Ramp of weir (underwater) (1m scale).



Plate 16: Dry section of weir in use as crossing point (1m scale).



Plate 17: Upstream side of flow control sluice gate (1m scale).



Plate 18: Downstream side of flow control sluice gate.



Plate 19: Sluice gate passage (1m scale).



Plate 20: Masonry feature indicating the previous presence of an anchor point for the timber post of an earlier sluice gate (1m scale).



Plate 21: Oak timber and steel I-beam resting on concrete covered stone apron.



Plate 22: Existing footbridge proposed to be removed; baffle rests to the left of this bridge (1m scale).



Plate 23: Ceramic fragments found throughout underwater survey area (150mm scale).



Plate 24: Metal strap stamped 'AYLINGS PATENT BUTTONS' (150mm scale).



Plate 25: Three (3) complete glass bottles found throughout underwater survey area (150mm scale).



Plate 26: One (1) complete glass bottle found in underwater survey area (150mm scale).



Plate 27: Two (2) glass bottle necks found in underwater survey area (150mm scale).

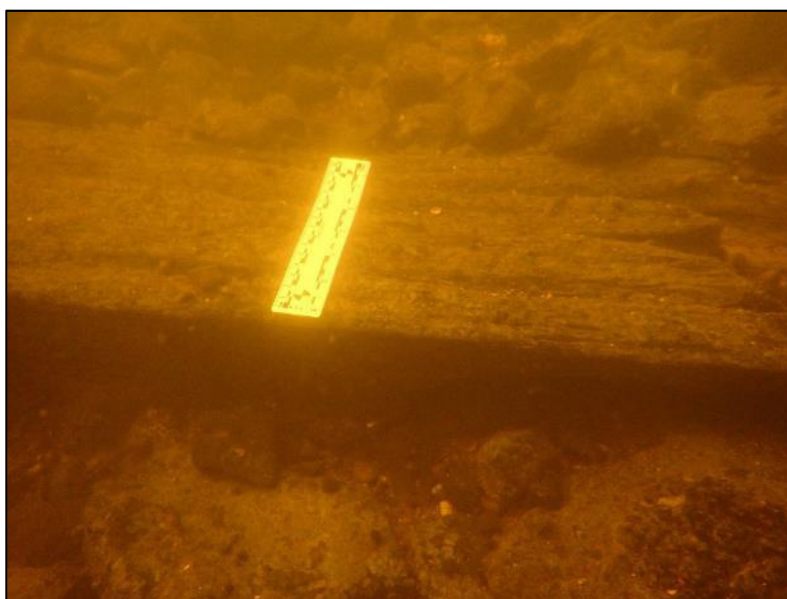


Plate 28: Eroded tree trunk resembling half-split log (150mm scale).



Plate 29: Cow jawbone (150mm scale).

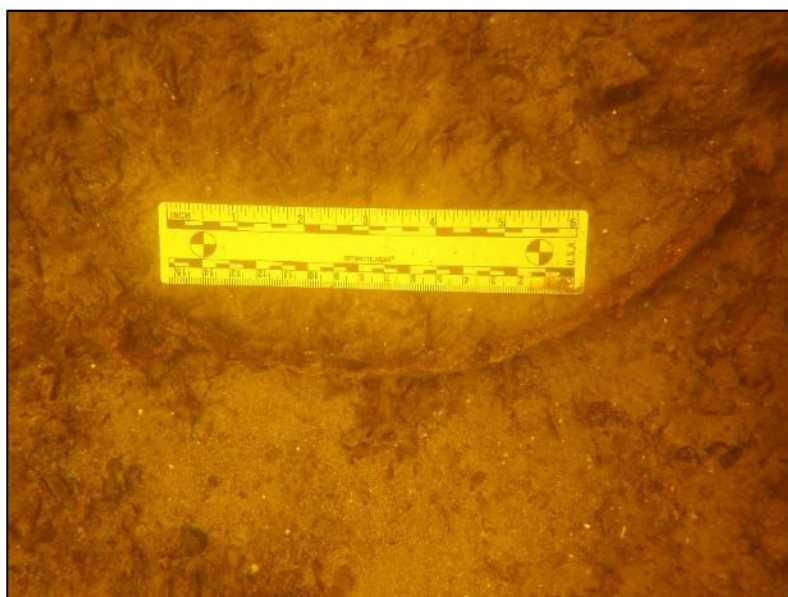


Plate 30: Fragment of iron pot-handle lying on riverbed (150mm scale).



Plate 31: Three (3) iron pot-handles found retrieved from riverbed (150mm scale).



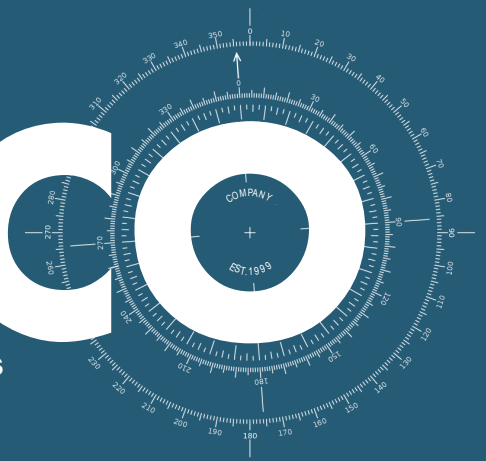
Plate 32: Tractor-tyre on riverbed.



Plate 33: Concrete support of footbridge built onto weir stonework (1m scale).

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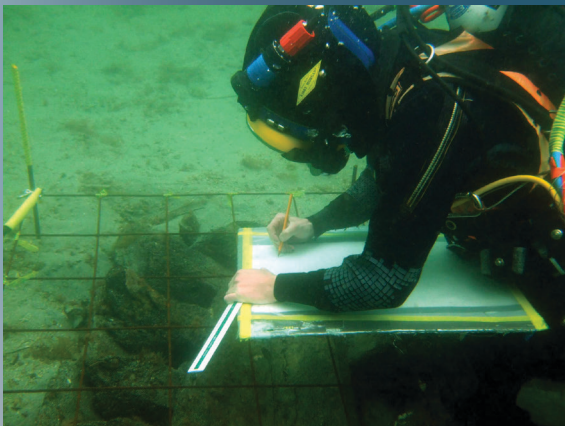
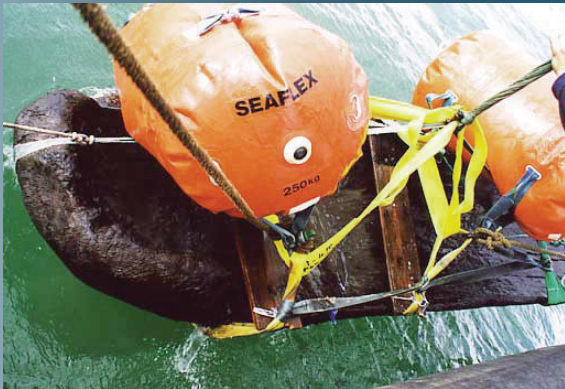


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