



The Welsh Government

Bute Dry Dock, Cardiff

Level 3 Historic Building Record





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Type of document (version) Confidential

Project no. 70043727

Our Ref. No. 70043727-300

Site Code: BDC22

Date: July 2023

WSP

4th Floor

6 Devonshire Square

London

EC2M 4YE

Phone: +44 20 7337 1700

Fax: +44 20 7337 1701

WSP.com



Quality control

| Issue/revision | First issue | Revision 1 | Revision 2 |
|----------------|--|--|------------|
| Remarks | First issue | Second issue | |
| Date | 9/06/2023 | 10/07/2023 | |
| Prepared by | George Knight Luke Tremlett | Luke Tremlett | |
| Signature | | Digitally signed by Tremlett, Luke (UKLTT001) DN: cn=Tremlett, Luke (UKLTT001), ou=Active, email=Luke.Tremlett@wsp.com Date: 2023.07.10 13:21:07 +01'00' | |
| Checked by | Anna Nicola | Toby Gane | |
| Signature | | Digitally signed by Toby.Gane@wsp.com DN: cn=Toby.Gane@wsp.com Date: 2023.07.10 14:35:42 +01'00' | |
| Authorised by | Toby Gane | Toby Gane | |
| Signature | | Digitally signed by Toby.Gane@wsp.com DN: cn=Toby.Gane@wsp.com Date: 2023.07.10 14:36:39 +01'00' | |
| Project number | 70043727 | 70043727 | |
| Report number | 1 | 2 | |
| File reference | \\uk.wspgroup.com\ukcentral\Environmental\ARCHAEOLOGY\WALE\Bute Dry Dock HBR 70043727\B Report | | |



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Executive summary

WSP UK Limited (WSP) has been appointed by the Welsh Government (WG, the Client) to undertake a level 3 historic building record (HBR) of the Bute Dry Dock, Cardiff CF10 4GA (the site). The Bute Dry Dock and its surrounding area are owned by WG and fall within a Masterplan area known as Porth Teigr. It is proposed to develop a masterplan for the area immediately surrounding the dock, thus the dock itself will form a long-term and integral part of the planned redevelopment.

The Bute Dry Dock formed part of wider Roath Basin complex that opened in July 1885 and was listed Grade II in 1992 (Cadw ref: 14062). It measured 190m x 29m and was formed in stone with altars c. 35m wide. The gate was located to the north and comprised a floating caisson which above water level was formed in steel. As part of the Roath Basin complex, it holds evidential and architectural value as a surviving example of a large mid-late 19th-century dry dock, a significant engineering feat with historical significance for its role in commerce and industry in Cardiff during the industrial evolution. It forms a group with the other assets included within the designation that comprises the adjacent Roath Basin, sea walls, dry docks and locks. These were constructed in the latter half of the 19th-century and together form part of the functioning port of Cardiff.

1 Introduction

1.1 Site background

- 1.1.1. This document presents the results of a level 3 HBR by WSP of Bute Dry Dock (the site), Cardiff CF10 4GA in the Borough of South Glamorgan (Figure 1. The record was appointed by the Welsh Government (the Client). The site was located along Teigr Way, Butetown, Cardiff, CF10 4GA, with an approximate centre of the site at National Grid Reference (NGR) 319532 174178.
- 1.1.2. The dock was orientated north to south, with a steel caisson at the north end of the dock which maintained water levels. There was approximately 17m of scrub land (with some foundations and concrete areas remaining) extending to the west of the dock, with approximately 22m of scrubland extending to the east of the dock.
- 1.1.3. At the time of the site survey, the site was unused open space, and sealed from public access by a 1.8m high chain link fence which extended the whole of the site boundary.
- 1.1.4. The on-site survey was undertaken using an unmanned aerial vehicle (UAV, or “drone”) piloted by Dr Pete Rauxloh of MOLA (Museum of London Archaeology) and accompanied by senior historic buildings archaeologist Anna Nicola of WSP. The site survey took place in February 2023 under fair weather conditions, with some strong winds. Processing of the drone footage, including the provision of video, photographs, and a 3D model was undertaken by MOLA on behalf of WSP who examined the data for information on the historical construction and phasing of the dry dock, and producing the subsequent drawings for this report.
- 1.1.5. The proposed long-term plan includes developing the primary infrastructure across the site including plateaus and east roads, footpaths, cycleways, statutory services, off site highway works, foul and surface water drainage, public open spaces, marine moorings, landscaping, and associated engineering operations to provide serviced sites for future development.
- 1.1.6. The Bute Dry Dock opened in 1885 and formed part of the wider Roath Basin complex that opened in July 1874. The dock was originally constructed in stone and measured 180m in length and 26m wide. A 20th-century caisson to the north was present between the dry dock and the Roath Basin and regulated the water flow and access for vessels transiting between the Roath Basin and the dry dock to move in between the two.
- 1.1.7. All work was carried out in accordance with professional standards and guidelines set out in Understanding historic buildings: a guide to good recording practice (Historic England, 2016), and Standards and guidance for the archaeological investigation of standing buildings or structures (Chartered Institute for Archaeology, Oct 2020).

1.2 Planning background

- 1.2.1. Bute Dry Dock was Grade II listed in 1992 as part of the wider Roath Basin complex to the immediate north listed as, 'Dock Walls of Roath Basin, including Sea Walls and Sea Lock, Walls of Locks, and Dry Docks' (Cadw monument ref: 14062). The site does not fall within any conservation areas, or any archaeological priority areas.
- 1.2.2. There are currently no confirmed design proposals for the redevelopment of the area comprising the dry dock, and therefore no current planning application has been submitted. The level 3 historic building record of the dry dock was recommended by WSP, in order to provide an in-depth analytical record of the asset, as previous heritage reports were not detailed enough to inform Cadw for the purposes of consulting fully on any future proposals or applications. In order to provide sufficient information WSP recommended a level 3 record of the dock in its entirety, in order to understand the full impacts of submerging it (Memo to Lindsay Neville dated 21 December 2021). A recommendation was made for draining the dock, which in turn would also require finding a permanent solution for the current caisson which is in need of some repair. Upon recommendation from WSP, the dock was not drained as it was unclear at this stage whether this would affect the stability of the structure.
- 1.2.3. The extent of the HBR was set out in accordance with a detailed Written Scheme of Investigation (WSI) (WSP, 2022) where it was stated that the record would comprise a level 3 report on Bute Dry Dock. The WSI presented the recording scope and methodology, reporting and archiving processes that were agreed upon with Cardiff Council and Cadw.
- 1.2.4. The historic building recording was carried out in accordance with Historic England specifications in *Understanding Historic Buildings. A Guide to Good Recording Practice* (Historic England, 2016) and other applicable standards and guidance, including ClfA Standards and guidance for archaeological investigations of standing buildings or structures (ClfA, 2014a).
- 1.2.5. The investigation of the site corresponds to a **level 3** HBR according to Historic England specifications (Historic England, 2016). A level 3 record is an analytical record and comprises an introductory description followed by a systematic account of the structures' origins, development, and use. The record includes an account of the evidence on which the analysis has been based, allowing the validity of the record to be re-examined in detail. It will also include all drawn and photographic records that may be required to illustrate the structures' appearance and structure and to support historical analysis.
- 1.2.6. In Memo between Lindsay Neville (Welsh Government/Cadw) and WSP (Elizabeth Murray) dated 21 December 2021, it was suggested that the survey would detail:
 - The use, phasing and development of the dock structure including the former structures on its periphery, for which only the footprints remain.

- The interior form and function of the dock, including those elements below the current waterline.
- How the infrastructure and fittings around the dock performed in the function of the dry dock, and how these may demonstrate any advances/changes in technology
- An understanding of the water management system between this and the adjacent dock structures and how that will be taken into account with any design proposals.

1.2.7. Due to the presence of deep water it was not possible to answer some of the questions posed in the Memo, however where possible additional data such as that generated by the LiDAR survey were examined to attempt as best as possible to answer the questions above.

1.2.8. Whilst the dock structure retains water and was originally structurally sound when dry, it may be that the pressure of the water when flooded proves damaging i.e., that water ingress behind the dock wall stonework causes it to fall away from the structure.

1.2.9. All work was carried out in accordance with the Written Scheme of Investigation (WSI), which was submitted to the Cadw Archaeological Advisor for information.

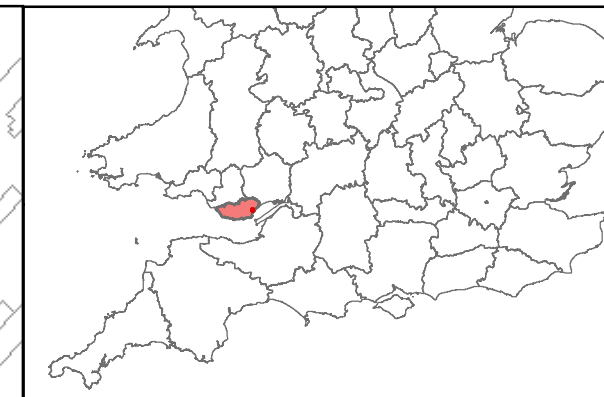
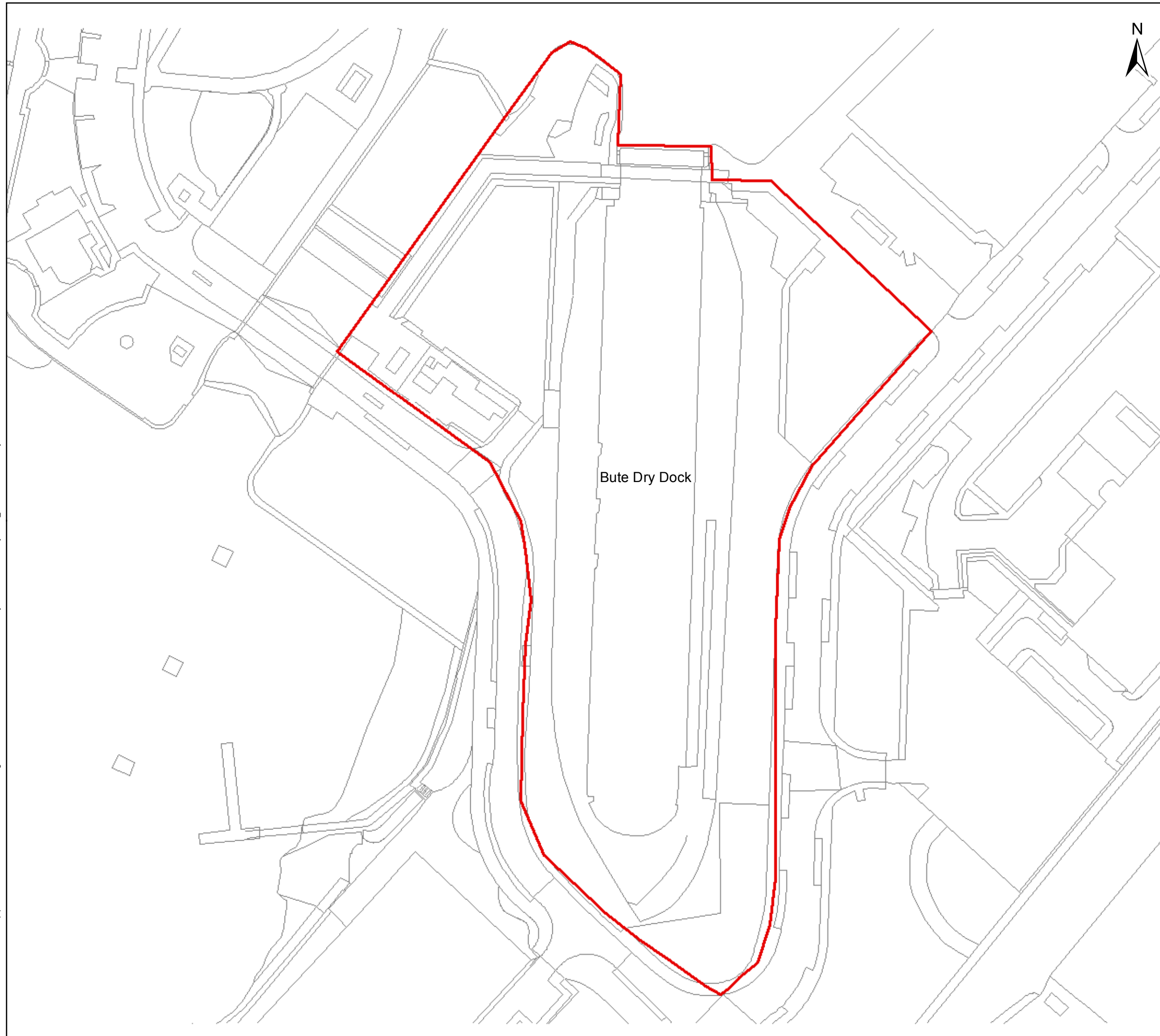
1.3 Limitations

1.3.1. Due the presence of deep water and debris over unstable ground, the site survey was undertaken using an unmanned aerial vehicle (UAV, 'drone') only.

1.4 Organisation of the report and conventions used

1.4.1. This report is organised in line with the scope of the WSI (WSP, 2022) providing an analytical account and a detailed photographic record of the Bute Dock. Only a selected number of photographs have been presented in this report in order to illustrate the construction of the dock. A list of all photographs with their description and archive identifier taken on the site visit can be found in Appendix C of this report.

1.4.2. The Bute Dry Dock is orientated approximately north to south. All maps and plans show true north, and measurements may be given in both metric and imperial where appropriate.



Key

Site Boundary

0 10 20 30 40 50

Meters



| | |
|-----------------|--|
| Client: | The Welsh Government |
| Project: | Bute Dry Dock, Cardiff, Level 3 Historic Building Record |
| Title: | Figure 1 Location of site |
| Date: | 23/11/2022 Scale: 1,000 @ A3 |
| Drawn: | RK Checked: AN Approved: AN |

1.5 Research aim and objectives

- 1.5.1. The research aim and objectives of the historic building survey were fully defined in the site specific WSI (WSP, 2022). The aim was to provide an improved understanding of Bute Dry Dock through a level 3 historical building record primarily for the purposes of supporting a planning application to redevelop the dock and to inform on any design mitigation, conservation and enhancement, but also for the purpose of preserving by record, the significance of the heritage asset for future generations.
- 1.5.2. This aim was achieved through the following objectives:
- **Objective 1:** Establish the character, history, dating, form and development of Bute Dry Dock through desk-based research supported by site-based investigation.
 - **Objective 2:** to make a detailed record of the dry dock in its present condition, in both 2-D and 3-D formats, by means of UAV and hand-held photography and with the use of existing scale drawings, along with a written record.
 - **Objective 3:** to report the results in suitable form to support the project aim and disseminate the results where appropriate in a suitable project archive repository, including the Historic Environment Record.
- 1.5.3. The Research Framework for the Archaeology of Wales (IFA Wales/Cymru, 2008) notes the following research priority relevant to the project:

“The utilisation of the Welsh shores for trade and settlement and the development of the coastal infrastructure of ports, harbours, and of coastal and estuarine navigation systems are of enormous importance. The study of the establishment of trading and supply routes across seas A Research Framework for the Archaeology of Wales Version 01, Final Paper Maritime This document’s copyright is held by contributors and sponsors of the Research Framework for the Archaeology of Wales. and along coasts and rivers will enhance understanding of settlement and control at every period” (IFA Wales/Cymru, 2008)

1.6 Site Specific research questions

- 1.6.1. The objectives of the historic building record set out above addresses the general need for recording and historical analysis to describe the structure of the Bute Dry Dock, its’ architectural detail, and archaeological evidence.
- 1.6.2. The following research questions have been proposed which will contribute to a wider archaeological research framework for the client by identifying new information concerning Cardiff’s archaeological past:
- What is the potential for the preservation of original fixtures and fittings associated with the dry dock to be present within the structure, which is currently obscured by the body of water which fills it?
 - What is the physical nature of the mechanism or system that links the caisson and Bute Dry Dock?

- Can the documentary record of Bute Dry Dock and the associated Roath Basin complex contribute to what is understood of the earlier harbours in the south-east Wales area, which were later abandoned and replaced by the large industrial-period ports?
- Using documentary sources and through the on-site investigation of historical fabric, what comparisons can be made with other national (and possibly international) sites of a similar nature in their historical use, design and appearance, as well as their present-day status? How have similar sites been treated post-closure?
- The Archaeological Research Framework for Wales identifies a complication that many nineteenth century port engineering drawings have been disposed of and no longer exist. Is it possible to identify any previously unknown drawings for the Roath Basin Complex and the associated Bute Dry Dock, either held by public institutions or by private collectors/bodies?
- Can the documentary analysis of the Bute Dry Dock contribute to the understanding of the use of river supply routes, and the wharfage of medieval strategic sites such as castles and towns?
- What can an investigation of Bute Dry Dock contribute to the present understanding of the use of Welsh shores for trade and settlement patterns, as well as the development of the coastal infrastructure of ports, harbours, and of coastal and estuarine navigation systems?
- Can any Welsh boat-building traditions, geographical traditions, or traditional industrial activities (such as slate, copper, and coal mining) be identified within the historical narrative of the Bute Dry Dock? If not, what patterns could be identified over a wider landscape?

1.7 Survey methodology

Introduction

- 1.7.1. Physical investigation of the dry dock was carried out by one buildings archaeologist and one UAV pilot. This aspect of the investigation was aimed at elucidating significant details regarding fabric, function, or the elements, methods/order of construction and development. All works were non-intrusive and did not include entering any confined spaces.
- 1.7.2. At the time of the site survey the dry dock was filled with a deep body of water. For this reason, no structural survey took place within the interior of the dock itself. However, a LiDAR MBES survey of the below water are of the dock was undertaken by Unmanned Survey Solutions (Kerry Beckwith, email) and assessed as part of this report, along with a report for the Inspection of Bute Dry Dock and Conditional and & Dimensional Inspection report (Kaymak Marine and Civil Engineering, 2018). A dynamic risk assessment at the time of the site survey found the ground littered with debris, with uneven footing. As the works were also taking place alongside ground investigations to extract bore hole data, and as the body of water was deep and not well fenced, it was decided on the day that the heritage team would undertake the survey from outside the perimeter of the fenced site,

with only a drone survey. Therefore, external surveys were not carried out around the dock edge, as these areas were not deemed safe to attend to.

1.7.3. The recording was undertaken in accordance with the following standards and guidance:

- *Understanding Historic Buildings: A guide to Good Recording Practice (Historic England, 2016),*
- *Standards and Guidance for the Archaeological Investigation and Recording of Standing Structures (ClfA, 2014)*
- *The Presentation of Historic Building Recording in CAD (English Heritage, 2005) and Photogrammetric Applications for Cultural Heritage (Historic England, 2017)*

1.7.4. In addition to the Historic England and ClfA guidance referred to above, the historic building recording was carried out in accordance with the site-specific WSI (WSP, 2022).

Photographic record

1.7.5. The photographic record was limited due to safety constraints as detailed in 1.7.2 above, and the presence of a perimeter fence obscuring the camera view from outside the site. Site photographs were taken using the drone.

1.7.6. The full photographic record, together with annotated plans and photographic registers, form part of the project archive. Selected images from the photographic record are used to illustrate this report. The report figures include plans showing the location of photographic plates used in the report.

UAV Photography

1.7.7. The UAV survey has captured photographic imagery of the dock using a mounted digital camera where water levels have allowed, and the context and surroundings of the dock from a greater variety of angles and heights than would have been possible with a hand-held camera.

1.7.8. The UAV comprised a DJI Mini 2 (weighing 249g) fitted with a digital camera sensor, which was capable of capturing images at 16 and 21 MP resolution (in uncompressed .TIFF format), and video in 4k resolution. The UAV was operated by a fully qualified and experienced operator from MOLA (Dr Peter Rauxloh) in accordance with an appropriate RAMS, licencing, and permissions.

1.7.9. The photogrammetry was carried out by flying the UAV over the site in a systematic fashion, capturing numerous overlapping oblique and nadir (vertical downwards) images (Figure 2).

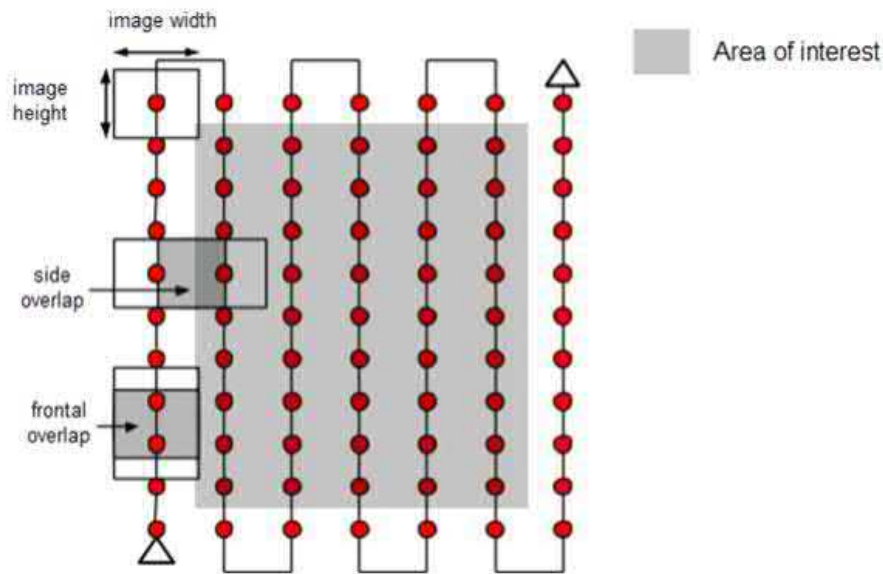


Figure 2- Photogrammetry employed on site

Video record

1.7.10. The UAV flights captured short high-resolution videos of the dock, and this footage was collected to be of use for the client for their own purposes. The imagery gathered allowed an engaging aerial view of the site and has formed a part of the project archive. Any specific requirements of the client, if within the agreed scope of the recording work, were communicated with the pilot prior to mobilisation to site.

Physical investigation

1.7.11. No physical investigation of the dock was carried out on site, due to the deep body of water, uneven ground, and debris. the site record was achieved using a drone only.

Written records

1.7.12. Due to safety constraints, hand-written notes, including hand-measurements of the dock structure was not made on site, due to unsafe site conditions. The 3-d model produced using the drone survey was scaled and measurements were extracted through this.

Drawn records.

1.7.13. At the time of the site survey there were no measured surveys of the dock. The 2-D and 3-D imagery of the dock collated by the UAV were used to create a digital drawn record in CAD, with a series of drawings created for illustrative purposes for the HBR report at a scale of 1:50.

1.7.14. In addition, a high resolution multibeam sonar (MBES) and lidar survey of the Bute Dry Dock was undertaken by Unmanned Survey Solutions (USS) on 14th February 2023. An Unmanned Surface Vessel (USV; Inception MKII.5), a vessel weighing 285g including payload and launch trolley, was used to collect the data from the water level of the dry

dock. Due to the accessibility of the dock, this was launched and recovered to the survey area using a crane. The MBES survey provided imagery of the vertical surfaces and base of the dry dock below the water line. A laser scan survey of the above water area, immediately surrounding the dry dock, was also performed for tie-in to wider topographic surveys of the study area.

Documentary research

- 1.7.15. A single day visit to Glamorgan Archives was undertaken as part of this record on 23rd March 2023 and an appropriate level of documentary archive research commensurate with a level 3 record was carried out to give an analytical account of the history and development of the site. Documentary sources for the history of the dock were consulted to provide evidence for dates of construction and significant modifications, along with any information on the activities undertaken in the dock during its use. The archival research was supported by desk-based research which included local history and community websites, as well as on-line newspaper and photographic archives.

Site archive

- 1.7.16. A digital (PDF) copy of this report will be deposited with the RCAHMW, and the Historic Environment Record for Wales, on the understanding that it will be made available as a public document after an appropriate period (not exceeding 6 months from the completion of fieldwork); a further hard copy will be sent to the client.
- 1.7.17. The Project Archive will include all drawn, and photographic records relating directly to the investigations undertaken. The archive will be quantified, ordered, indexed and internally consistent before permanent transfer to the Royal Commission on Ancient and Historical Monuments of Wales (RCAHMW / Comisiwn Brenhinol Henebion Cymru).
- 1.7.18. The site has been allocated the site code **BDC22** which will be used to identify the physical and digital archive.
- 1.7.19. Physical records will be curated and be made available for public consultation in a site archive compatible with other archaeological archives in the RCAHMW and adhering to standards set out in the following:
- Archaeological Archives: a guide to best practice in creation, compilation transfer and curation (Archaeological Archive Forum, 2011)
 - Standards in the Museum Care of Archaeological Collections (Musems and Galleries Comission, 1992)
 - Retention and Dispersal of Archaeological Collections (Society of Museums Archaeologists, 1992)
 - Towards an Accessible Archive. The Transfer of Archaeological Archives to Museums: Guidelines for Use in England, Northern Ireland, Scotland and Wales. (Society of Museums Archaeologists, 1995)
 - United Kingdom Institute for Conservation Guidelines for the preparation of excavation archives for long term storage (United Kingdom Institute , 1990)

1.7.20. Copyright of the written archive will be vested in the project archive repository.

1.7.21. The archive will include:

- A cover sheet formed of a tabulated list of drawings/notes with description, sheet number, date and initials of surveyor.
- A full colour printed and bound copy of the Level 3 historic building record.
- A list of photographs archived digitally through ADS, which will include site code, original file name, and direction of view.
- Any reports or historical documentation (photographs, newspapers etc) discovered during the record and not otherwise archived elsewhere. This would be subject to agreement with Maidstone Archives
- Printed full colour (if applicable) copies of any digital drawings made onsite, if not included in the report.

1.7.22. The archive will be presented to the archive officer at the RCAHMW in Wales within 12 months of the completion of any publication work (unless alternative arrangements have been agreed in writing with the Local Planning Authority).

1.8 Limitations

1.8.1. At the time of the site survey the dry dock was filled with a deep body of water. For this reason, no structural survey took place within the interior of the dock itself. A dynamic risk assessment at the time of the site survey found the ground littered with debris, with uneven footing. As the works were also taking place alongside ground investigations to extract bore hole data, and as the body of water was deep and not well fenced, it was decided on the day that the heritage team would undertake the survey from outside the perimeter of the fenced site, with only a drone. Therefore, external surveys were not carried out around the dock edge, as these areas were not deemed safe.

2 Historical background

Prehistoric period (800,000 BC – AD 43)

2.1.1. Prehistoric activity within the site and its surrounds would have varied significantly due to the nature of its marshland environment. The available archaeological evidence suggests that the area of the site would have been located to the immediate south of the 'Taff delta', where the rivers Taff, Ely and Rhymney meandered into the Severn Estuary. During this period, the site itself was either submerged, or occupied by intermittent raised bogland, as is suggested by prehistoric finds recorded nearby, which include a Neolithic axe head recovered from within a peat bed. Archaeological investigations have also recorded several peat deposits which measured roughly 1.25km to the north-east of the site (SLR Consulting, 2012). Activity within the site and surrounding area had likely increased during the Bronze and Iron Age, as is evidenced by residual finds recorded further inland. Activity within the site however, likely remained seasonal due to the fluctuating wet environmental conditions (Davies, 2017).

Roman period (AD 43-410)

- 2.1.2. During the early 1st century AD, the area formed part of a territory which belonged to a warrior-like Celtic British tribe called the Silures, but the area of South Wales increasingly came under the influence of Roman military presence and its administration. By the early 60s AD the Romans had advanced into South Wales, and by AD 78 had completed the conquest of the region. This was quickly followed by the construction of forts and roads, which gave the Romans an opportunity to establish control and implement a Roman way of life (Webster, 1984).
- 2.1.3. The Roman conquest culminated in a period of peace, and although very little evidence is recorded about the lives of the native tribes, it is possible that some form of tribal identity continued (Ashley M. , 1998). During this time, Roman-style buildings were constructed, such as villa farmsteads, which would have co-existed as elite residences alongside traditional native building types.
- 2.1.4. A Roman fort was constructed between AD 55-75 near the mouth of River Taff, roughly 2.75km to the north-west of the site (Sherman, 2004). This military outpost, from which the name 'Caerdyf' meaning 'the fort on the Taff' likely originates, was constructed to first assert dominance over the local 'Silures' tribe, but later acted as a maritime trading hub and civilian settlement. The settlement was rebuilt up to four times and expanded on until the 4th century, when it was subsequently abandoned (Spurgeon, 2001).
- 2.1.5. During the Roman period the area encompassing the site would have remained marshland and may have periodically been submerged, depending on the fluctuating environmental conditions. Residual finds recorded at Mount Stuart Graving Dock, 500m north-west of the site, included coinage dated to the reign of Emperors' Gallienus (218-268 AD) and Carausius (d. 293 AD) which suggests maritime activity within this area. In addition, a

brass of late Roman Emperor Honorius (384-423 AD) was recorded in Grangetown, 1.75km to the north-west (Evans E. , 2001).

- 2.1.6. Following the withdrawal of the Roman army from England in the early 5th century AD the whole country fell into an extended period of socio-economic decline. Wales also witnessed a decline of Roman occupation, and this is reflected in the archaeological record of the Cardiff area (Evans E. , 2003). The site and its surrounding areas came under the control of either of two the petty kingdoms of Glywysing or Gwent in the 6th century, which continuously disputed the marshland around the site. By the 8th century the kingdoms of Glywysing and Gwent had been united under King Morgan ab Athrwy, who was also known as Morgan Mwynfawr, meaning “Morgan the Generous” (Wales, National Library of Wales, 2023a). This king is thought to be the origin of the name Morgannwg (Glamorgan) which meant 'territory of Morgan', although other historians have argued that Morgannwg refers to the later 10th century King Morgan Hen (Ashley M. , 1998). At the beginning of the 10th century the majority of Wales except Morgannwg was ruled by King Hywel Dda. From the 9th century sporadic Scandinavian raids took place along the south coast of Wales, impacting coastal settlement, and no doubt the rulers at the time would have had to contend with these invasions (Richards, 2008).

Medieval period (AD 410-1540)

- 2.1.7. With the conquest of the kingdom of Glamorgan by the Normans in the late 11th century, settlement was re-established in Cardiff. Building out of the existing Roman fortifications, King William I in 1081 began the construction of a motte and bailey castle and a new surrounding ‘borough’, in which the medieval town gradually arose. Even at its peak, prior to its near complete destruction in 1403 by Owain Glyndŵr, the Welsh rebel and later Prince of Wales, the urban area of the medieval city only just extended beyond St Mary’s Church and the Benedictine monastery (Spurgeon, 2001) roughly 2km northwest of the site.
- 2.1.8. Following the Norman Conquest, Morgannwg was the second part of Wales, after Gwent to be absorbed by a Norman lord, Robert Fitzhamon, feudal baron of Gloucester (Cardiff Castle, 2023). Fitzhamon died in 1107 and in 1122 the lordship of Glamorgan was given to Robert Fitzroy, the illegitimate son of King Henry I and Earl of Gloucester, who was married to Fitzhamon’s daughter Mabel (English Monarchs, 2022).
- 2.1.9. The centuries that followed the Norman conquest saw the manorial system of Wales develop along English lines, and the landscape of Glamorgan began to change with the construction of Norman churches, castles and the development of nucleated villages. Manorial open fields were established for crops, and parishes were characterised by their nucleated plans formed by dwellings around a church, inn and a manor house and located in great open fields, meadows, and fallow land on which the community depended (Jones, 1994).
- 2.1.10. The English monarchy struggled to control the lordships in Wales in the later Medieval period, and this threat was only neutralised after the Despenser War in 1321-1322 which

made Marcher independence less important. The Despensers held the region intermittently from the 13th century until 1400, where it was passed on to the Beauchamps (Holmes, 1972). Whilst under Despenser authority in 1320, a survey was undertaken for Hugh de Despenser, Lord of Glamorgan in order to assess ploughlands in the region, and coastal areas were well established for arable purposes.

- 2.1.11. Increased maritime activity in the Severn Estuary between the 11th and 14th centuries, particularly with the growth of ports at Bristol and Watchet, would likely have meant activity passing over the site (Richards, 2008). In 1326, alongside Carmarthen and Shrewsbury, Cardiff was given the status of a staple port by King Edward III for its crucial role in the exports of wool and hides (BHO, 2023), although this privilege was later revoked in 1332 (Richards, 2008). By 1340 the city's ports continued to expand as quays on the River Taff (2.7km north-west of the site) had become significant enough for them to secure self-governance, under a charter between the town burghers and Lord Hugh le Despenser (BHO, 2023). In the 15th and 16th centuries, the port continued to operate as a smaller, but significant hub under the wider network of trading operations based out of Bristol, whose ports had grown capable of taking larger trading vessels (Richards, 2008).
- 2.1.12. Within the site itself, no archaeological evidence has been found nearby to suggest any changes. A late 12th century charter of Henry, Bishop of Landaff, referred to salt marshes further inland at Grangetown to the monks of Magarm located 2km west-northwest of the site. This suggests that the site was still formed of a salt marsh and open water, having been located farther out. A subsequent charter dated to 1423 refers to Grangetown as a 'moor' and as having a profitable farm, which could suggest that gradual land reclamation and drainage was slowly approaching the site, but it is assumed the site during this period remained submerged.

Post-medieval period (AD 1540 - present)

- 2.1.13. For various political reasons, seigniorial control had weakened by the 15th century giving the middling English and Welsh farmsteads the opportunity to build their estates, some of them substantial enough to become gentrified. This stimulus of land development and ownership was instigated further by the Dissolution of the Monasteries in the 16th century which made more land available, but also led to greater enclosure (Jones, 1994). The increase in the population of the 16th century put pressure on resources and had the effect of creating an external market of provisions such as butter, malt and oats which were in constant demand from Ireland, France and England. Timber was needed for the construction of buildings, but also for shipbuilding, and charcoal to supply the metalworking industries (Jones, 1974). Mining had been important in Glamorgan since the 13th century but had increased during the 16th century when the king was reluctant to rely on continental sources (Jones, 1974). Production took place on a small scale and gentry families were often associated with these enterprises as they realised the value of the minerals on their estate; in later centuries these were exported to Ireland, western England, and France.

- 2.1.14. By the 17th century, Cardiff gradually began to expand beyond its medieval walls and had acquired considerable trade networks with continental ports at Bordeaux and La Rochelle. Its considerable cargo enterprise even made it a target for naval pirates who preyed on merchant vessels near the port in 1626 (Richards, 2008). Despite its increasing prestige, the extent of the city remained distant from the current area of the site and only gradually began to move southwards. John Leland in 1536 described a lesser suburb and roads developing outside of the South Gate in St Mary's Parish (roughly 2km north of the site), suggesting that gradual land reclamation had begun (Spurgeon, 2001). This evolution is illustrated in John Speed's 1610 map, which shows foliage and trackways going towards the salt marshes beyond the southern city boundary (not reproduced, *ibid*). This expansion towards the site, however, was slow by frequent reoccurrences of extreme flooding from 1607 which led to the abandonment of St Mary's Church. By 1802, however, the had evidently continued as the demolition of the South Gate was directly requested of by the residents of the newly reformed St Mary's Parish, which occupied the land immediately north of the site.
- 2.1.15. During the 17th century the iron industry faced disruption during the Civil War, preceded by concerns over the amount of timber being felled to provide the charcoal fuel needed. Charcoal remained the fuel for the blast furnace until the mid-18th century, but coal was increasingly used for forging iron which resulted in a gradual shift of this industry towards the coalfields.
- 2.1.16. By 1750 dramatic economic changes were driven by numerous wars such as the Seven Years' War in which Britain required the production of metal on an industrial scale to produce cannonry and projectiles (Jones, 1994). This in turn further stimulated coal production, and it became necessary to experiment with transportation to ease supply lines. Improvements in transportation were also required in order to increase the speed and the quantity at which goods could be moved (Mathia, 1979). These factors led to deteriorating conditions for labourers, and a direct threat to the farmworker's livelihood, ultimately culminating to the widespread unrest known as the Swing Riots (Buckley, 2023).
- 2.1.17. Central to these enterprises was Cardiff, which though the head port of the Monmouthshire and Glamorgan coast, was still a very simple quay and wharf during the late 18th century. Additionally, there was a smaller port elsewhere in Glamorganshire, but this was unable to accommodate larger shipping vessels as the dock was too shallow which made transportation slow and expensive. This led to the passing of the Glamorgan Canal Act in 1791, leading to the construction of a network of waterways to serve the iron manufacturing industry then developing at the heads of the Taff valleys. These areas were well suited for iron-manufacturing as they had readily available resources such as extensive forests which were needed to provide charcoal, along with local sources of ironstone, limestone, coal, and water. In 1796, the Act was extended to permit the construction of a sea lock, which in turn stimulated further ironworks and collieries in the local area.

- 2.1.18. In 1839 the West Bute dock was opened, led by the need to improve capacity of commercial traffic through the canals (Parliament, 2023). At the same time, the Merthyr ironmasters formed the Taff Vale Railway Company and constructed a railway from Merthyr Tydfil to Cardiff which eased the transportation of goods to such an extent that it was not long before West Bute dock was unable to keep up with the demand in volume (Craig, 1980). Further improvements included in 1859 a new tidal harbour, an entirely new dock at Penarth was also opened in 1856 and the Roath Basin which had been envisioned in the 1860s was opened in 1874 after some delays caused by the American Civil War.
- 2.1.19. By the end of the 19th century Cardiff had grown to become one of the largest towns in Wales with its port facilities handling more coal than anywhere else in the world. Coal exports reached their peak on the eve of the First World War in 1913, when over 13 million tonnes were transported abroad. It was during this period that the international price of coal was struck in the Coal Exchange building in Cardiff, where the world's first £1 million-pound deal was signed. The international demand for coal slumped after the Second World War, and by the 1960's coal exports had virtually ceased (Cardiff Bay, 2022).

Bute Docks & Port of Cardiff

- 2.1.20. The growth of industry in Wales during and prior to the industrial revolution led to the expansion of Cardiff and its port, notably because of the increased exportation of iron and coal materials. Their increasing trade through Cardiff's docks from the mid-18th century onwards necessitated the development of more efficient modes of transport, which was answered in the form of the Glamorgan Canal. The construction of canal was mandated by a Parliamentary Bill in 1787 and it was quickly built and finalised in 1794, with a further extension of a sea lock onto the Seven Estuary in 1796 (Richards, 2008). The increasing demands of industry, however, soon meant the canal became over-subscribed and the Marquesses of Bute (the landowners) found it necessary to expand the docking capabilities (Richards, 2008). The need to expand also became pertinent due to the increased competition from Taff Valley Railway company, whose plans to build their own independent docks were negated by allowing them to lease the eastern portion of the new Dock for 250 years (*ibid*). After acquiring consent through the first Bute Dock Act 1830, work began on First Bute (West) Dock and the attached housing called 'Butetown' in St Mary's Parish, just north-west of the site. Both were funded by John Chrichton-Stuart, 2nd Marquess of Bute and were designed Admiral William Henry Smyth and engineer George Turnball. As the 1845 Tithe Map show, at this time, the site was still situated in open water, approximately 300m south of salt marshes, meadow and reservoir allotments and the new West Bute Dock (Figure 3).

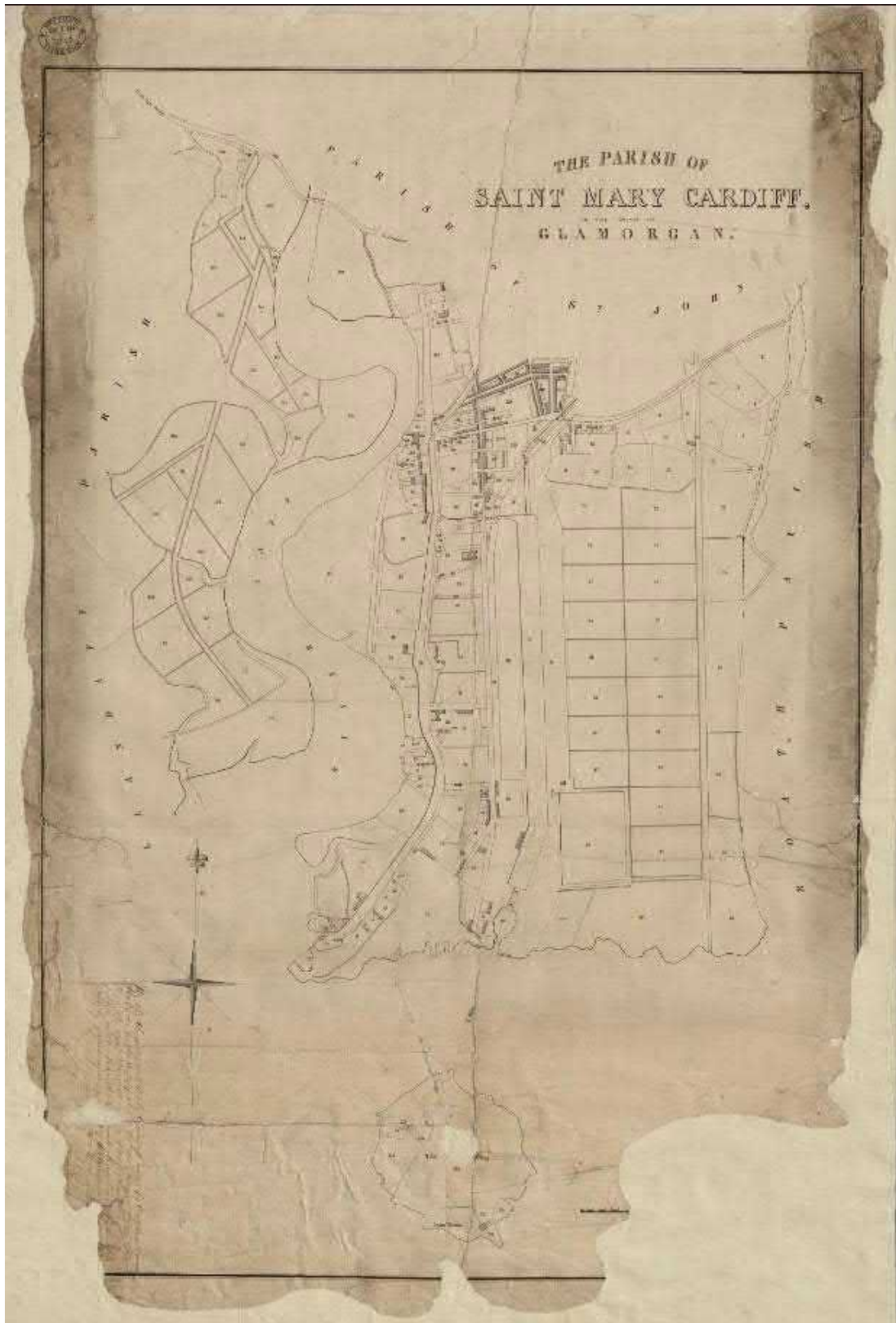


Figure 3 – 1845 Tithe Map of St Mary's Parish, Cardiff, Glamorgan (Wales, National Library of Wales, 2023a)

- 2.1.21. As a result of the dock’s early success and the rise in competition from rival docks in Penarth, the Bute Trustees built East Bute Dock, 900m north of the site, for £193,284 between 1855-59 (Richards, 2008). Following permissions granted by the Bute Dock Act 1866, the Trustees then proceeded to build the Roath Basin and reclaim the open water and marshes that the site occupies in 1874 (Hutton, 2008).
- 2.1.22. The Ordnance Survey 1st Edition 6” : mile map of 1880 (Figure 4) shows the surrounding Roath Basin and Lock, and the new raised stone quays constructed within the site. The map shows that the site area to the south-east of main lock into Cardiff Bay; it was occupied by several rail sidings and buffers, as well as a rectangular structure within the western part of the site, which remains extant as the Grade II listed Workmen’s Hut (Cadw ref: 14061).

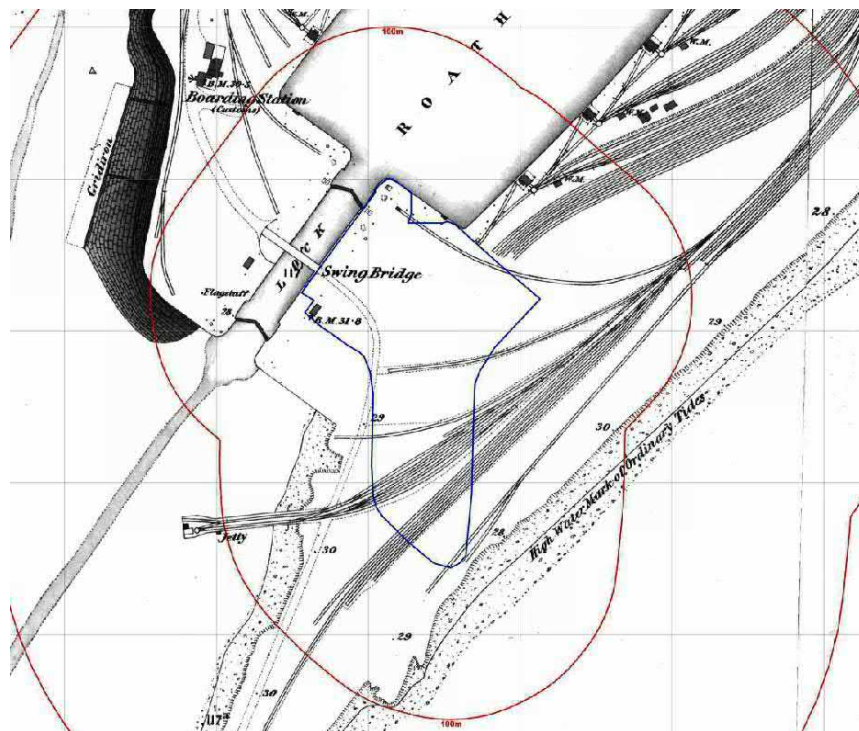


Figure 4– The Ordnance Survey 1st Edition 6” : mile map of 1880

- 2.1.23. In 1882, permission was granted by parliament to the ‘Trustees’ of the Marquess of Bute in the Bute Dock Act 1882 to ‘extend their Docks and Railways’, particularly with the construction of several dry docks. This was undertaken by the newly formed Bute Shipbuilding, Engineering & Dry Dock Company who began operations on the 22nd March 1883. The company began the construction on Bute Dry Dock, whose initial purchase cost was around £175,000 (Glamorgan archive, ref. D746), and is the asset recorded as part of this historic building survey.
- 2.1.24. The construction of Bute Dry Dock was led by Chief Engineer John McConnochie, who had been elected as Mayor of Cardiff with a salary of £300 and who was in 1882

responsible for the design and oversight of the construction of the Roath Basin (ICE Publishing, 08) (BHO, 2023).

- 2.1.25. Although no original plans or drawings for the construction of the dry dock could be found, an account produced by McConnochie himself and dated to the construction phase of the dry dock in 1884 is crucial as it provides some constructional details about the dry dock itself. According to this account, which coincided with a tour given to members of the Institute of Mechanical Engineering, the structure measured 600 ft / 183m long, 87 ft / 25.5m wide at the north end, and 28.5 ft / 8.7m deep (McConnochie, 1884). The account also describes the dry dock as having been emptied by two centrifugal pumps with a 4ft diameter, each located in a separate well and powered by two horizontal non-condensing engines which comprised a 16-inch diameter with a 3ft. stroke and processed 80 lbs steam. The account also reveals that the dock could be filled either from the Roath Basin or the tideway and had been fitted with a moveable caisson which could be placed at any of the three recesses near the centre of the dock. The same 1884 report, demonstrated to the Institution of Mechanical Engineers in August 1884, this barrier measured '87ft. / 26.5m length, 16ft / 4.8m wide and 29ft / 8.9m depth' (McConnochie, 1884). Illustrations from McConnochie's report shows that pressure pipes extended under the northern and western edges of the site, emanating from Bute Dry Dock out into the lock and Cardiff Bay (Figure 5).
- 2.1.26. The account records that the iron gates for the dock were being produced by Bute Shipbuilding, Engineering and Dry Dock company's iron works, and the construction of the dry docks was nearing completion. This is also confirmed by the company's annual shareholders report of March 1884, which recorded that it expected the works to be finalised around McConnochie's tour (Glamorgan Archives, ref. D746). Although not illustrated by McConnochie, the company's new buildings and associated dock machinery were also under construction at this time, resulting in total cost of £3,133.6.2. The construction was completed in early 1885 and the first ship entered Bute Dry Dock on the 22nd January (*ibid*).

Fig. 1. Plan of Bute Docks.

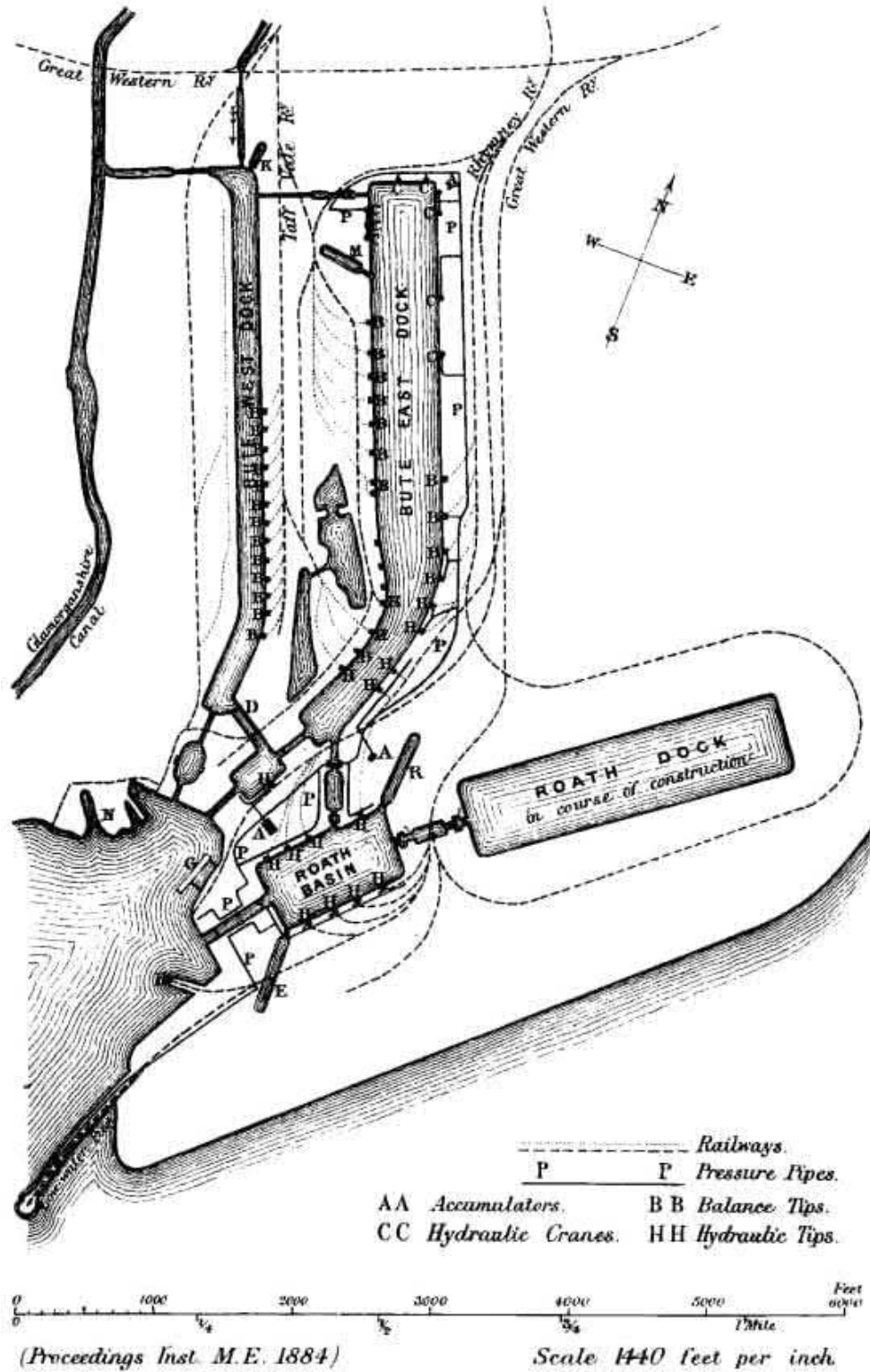


Figure 5– Institute of Mechanical Engineer, 1884, plan of Cardiff Dock (McConnochie, 1884)

- 2.1.27. Expansion around the site continued rapidly with further expansion being sanctioned by Acts of Parliament (the Bute Dock Act) in 1888, 1890, 1892 and 1895 (Cown and Database, 2023), extending the quays to the east and south. Roath Dock, 500m to the north-east of the site, opened in 1887 and the Channel Dry Docks and Pontoon Co. open was completed 60m south-west of the site in 1895. The railway lines were extensively expanded over the quays resulting from the growth of the overarching Bute Docks Company who bought the quays from John Patrick Crichton-Stuart, the 3rd Marquis of Bute in 1886 (Richards, 2008). They later rebranded as the 'Cardiff Railway' company in 1897, to capitalise on the increasing coal railway trade that was being contested by Barry Docks further west along the Glamorgan coast (Hutton, 2008). By this time, coal exports from Cardiff Docks were exceeding 9 million tonnes per annum, much of which was exported by local steamboats who utilised the Bute Dry Docks and its neighbouring rival Mountstuart Dry Docks Co. (founded in 1882) who gradually expanded their dry docks from one to three in 1906 (Hutton, 2008).
- 2.1.28. The continual expansion of shipping and trade can be seen in the Ordnance Survey 2nd Edition 6" mile map of 1901 (Figure 6), which shows the recently constructed Bute Dry Dock and the adjacent Channel Dry Dock to the south. According to the Bute Shipbuilding company's shareholders meeting minutes, this increase in exports was bringing larger and more modern vessels, which were continuously struggling to be accommodated in the dry dock (Glamorgan Archives, ref. D746). As such, the shareholders agreed to extend the dock 'on one side' (BHO, 2023), but it remains unclear which side was extended as the dimensions of the dock (600ft x 87ft) mentioned in 1884 remains in place (McConnochie, 1884). However, it is worth noting that the eastern length of the dock showed signs of repair and possible reconstruction, where the elevations are seemed to have been formed of concrete block instead of stone.
- 2.1.29. What is made clear by the 1901 map, however, is that the dock had a chevron caisson in the form of canal lock style gates which open northward to Roath Basin. It had some rail lining the east and west sides of the dock for a travelling crane. Otherwise, the dock structure appears much as it does today with a semi-circular southern end showing the two staircases leading to the bottom of the dock and recesses midway along its length to accommodate a caisson which is conveniently depicted in position.
- 2.1.30. Across the wider compound, several warehouses and workshops line Bute Dry Dock to the east and west. Those along the north-western extent contain four buildings set in an angular formation away from the dock. The southernmost of this range most likely represented an arched throughway over the dockside path, which was opened facing south-east.
- 2.1.31. A range of buildings are depicted along the southern half of the dock, along the western extent. The southernmost is shown as a continuous long structure, and probably represented storage areas. A small structure abuts it to the north. The northernmost building is far smaller, with an angled end which faced north-east.

2.1.32. To the west of the site area, the Workman’s Hut remains visible. The buildings constructed along the eastern length of the dry dock are much larger and are set farther back. These three rectangular buildings are shown to have small angular structures fronting the deck of the dock, which may represent an office of sorts fronting workshop. According to the 1901 Trade Directory of Wales, these buildings were occupied by the Bute Shipbuilding, Engineering & Dry Dock Company’s various branches of production, notably ‘Boiler Markers’, ‘Coppersmiths’, ‘Iron founders’ and ‘Ship and Boat Builders’ (Trades’ Directories Limited, 1901).

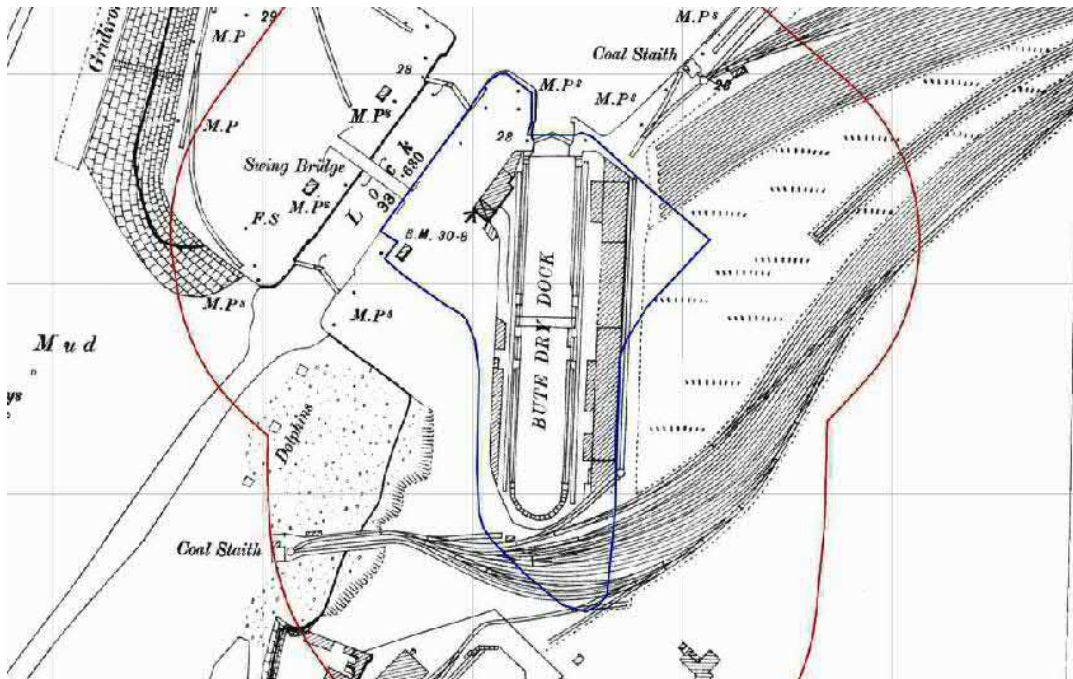


Figure 6 - Ordnance Survey 2nd Edition 6”: mile map of 1901

2.1.33. Further eastward the dock buildings are fed by a single line of rail with a turntable joining sidings south of the dock that led to and from a coal staithe 100m south-west of the dock in Cardiff Bay. To the east of the dry dock a number of railway tracks are seen to terminate close by, with several shed buildings distributed across the landscape. At the south-east corner of the site a number of tracks sweep below the site and out over the sea to a coal staithe, whilst another appears to feed this coal directly into the southernmost building within the dry dock.

2.1.34. By 1906, the Bute Shipbuilding, Engineering and Dry Dock company was flourishing and were able to afford the latest technology for the docks. A visit by the Institute of Mechanical Engineers in 1906 recorded a number of technological improvements such as a crane railway which was able to lift 30 tons, and with a lifting power of 11 tonnes over a radius of 50 feet between the dock and workshops (Institution of Mechanical Engineers, 1906). The tracks for the moving crane were still visible at the time of the site visit, as well as on the historic mapping. The 1901 OS Map (**Figure 5**) shows that the crane tracks were present on both sides of the dry dock at this time and were located close to the edge of the

dock in order to facilitate lifting loads direct to and from ships. The company was also reported to have invested in new and modern machinery, plant, and tools, as well as having upgraded the workshops, yard and the dock itself to benefit a 'complete electric-light installation' meaning that the dock workers could later, and even overnight. The 1906 report detailed that Bute Dry Dock itself had been slightly upgraded since its construction and described how the dock had been since fitted with a 'complete equipment of electrically driven appliance', but still used the powerful steam-pumps and sluices that the original designer McConnochie had detailed in 1884. In fact, the report indicated that little alteration had been made to the main structure as the dry dock could easily accommodate a 'modern-sized steamship' (Institution of Mechanical Engineers, 1906).

- 2.1.35. Although previously the dry dock accommodated as many as five vessels at the same time, by 1906 the dry dock was reported to provide services primarily for singular but much larger ships such as ocean liners, military ships, sailing ships, and mud dredgers. An example of such a ship which illustrates the importance of the Bute Dry Dock during the early 20th century was the Japanese cruiser 'Takasago', which was cleaned and painted during a three-day residence in August 1902. The Takasago carried part of the official Japanese delegation for the coronation ceremonies of King Edward VII and was utilised to celebrate the Anglo-Japanese Alliance ratified early in January. What made the dry dock so attractive for significant vessels was not only its size and proximity to Cardiff Bay, but also its 'capabilities for docking loaded ships' from the various railway lines that can be seen in the 1901 OS Map. The two examples cited by the 1906 report were the 'Vauxhall Bridge' and the 'Hillgrove' vessels, who were loaded with 8,000 and 5,500 tons of coal respectively from the nearby railways and warehouses whilst being repaired (Institution of Mechanical Engineers, 1906).
- 2.1.36. The coal industry surrounding Bute Dry Dock continued to develop and led to further construction across the Cardiff docks to cope with the ever-increasing demand in coal and its associated industries. This included the construction of a large dock approximately 250m to the south-east in 1907 which was named the Queen Alexandra dock after the consort of the ruler King Edward VII at that time. By 1913, the shipping of coal had reached its peak and 13 million tonnes of coal was being shipped from the Bute Docks, meaning it had shipped one-third of the global coal exports, with the dry dock continuing to play as a significant role in maintaining the flow of merchant vessels (Richards, 2008). During the First World War, the dry dock supported military operations by building, repairing, housing and holding ships that played the critical role of importing an unending flow of desperately needed coal. The dry dock, along with all other operational docks in Cardiff, soon became constantly monitored and guarded by military personnel, including up to 6,000 US Marines from 1917 onwards who were sent to defend the US' primary maritime entry route into Britain (*ibid*).

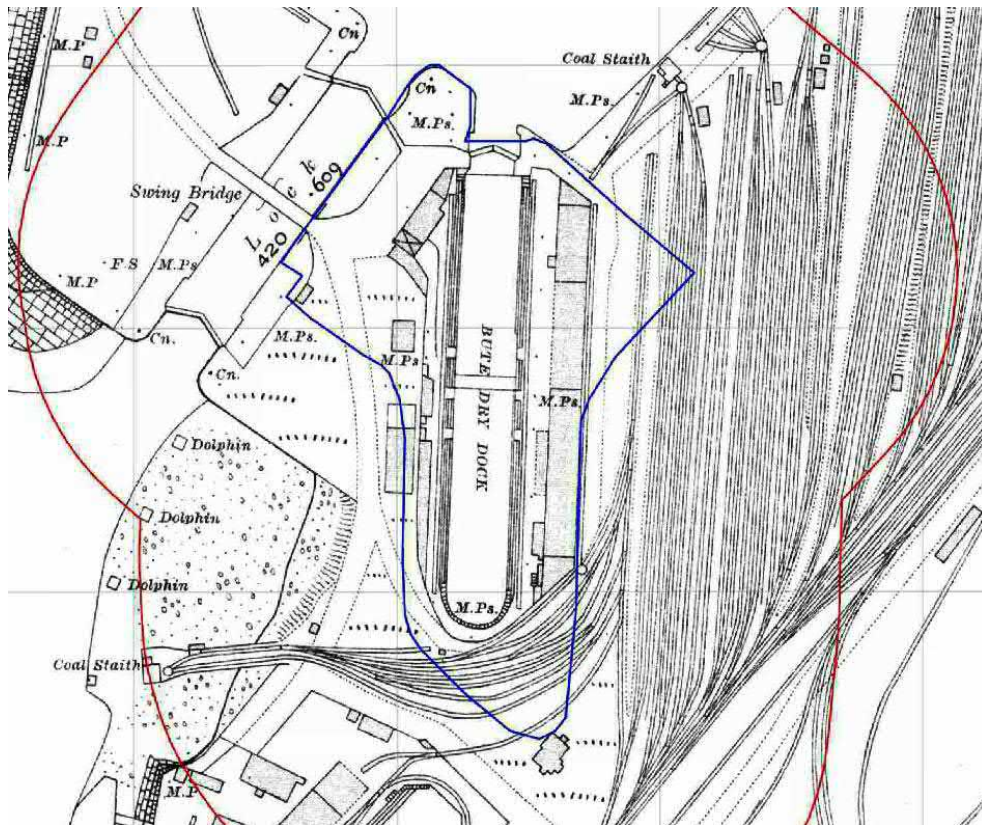


Figure 7- The Ordnance Survey 3rd Edition 6": mile map of 1920

- 2.1.37. The Ordnance Survey 3rd Edition 6": mile map of 1920 (Figure 7) shows minor changes within the site. The same buildings remain along the western extent, but those closest to the centre of the dock have acquired small walled structures at their northern and southern ends. In addition, three buildings have been constructed further out on the terrace above the dockside, the southernmost of which displays a walled area to the north. At the very north of this range the arched throughway seen on earlier mapping has acquired an extension which abuts it to the south. New roads have been laid out along the western extent.
- 2.1.38. To the east, the row of workshops remained intact with minor alteration of the frontage which appear to have been reduced on the northernmost building. It is unclear whether the staircases shown in the 1920 map were recent constructions either side of the dock fronting the caisson, or whether this detail was too minor to show on the 1906 map. Likewise, mooring posts are now shown- although they would likely have been present in some form at the time of construction. To the south and east, the railway sidings have been extended dramatically and now lead to further a coal staithe to the north by the Roath Basin, and to the south-west as previously seen.
- 2.1.39. The gradual expansion of the docks likely came as a result of the post-war boom which saw an increased demand for coal and iron which were the main export of the docks (Richards, 2008). However, with the onset of steel and electricity the boom did not last and by the mid-1930s the exports which peaked in 1913, had dropped by half. This change in

the industrial landscape saw the closure of the opposing Penarth dock and prompted a reaction from the multiple privately owned dock companies who decided agreed to merge in order to pool their assets in a bid for survival (Richards, 2008). In the mid to late 1930s, in response to this the Bute Shipbuilding, Engineering and Dry Dock Co. Ltd had agreed to merge with the nearby Channel Dry Dock Co. and began operating as 'Channel and Bute Dry Docks Co.' (Glamorgan Archives, ref: D592/3/3/4; Glamorgan Archives, ref. D746).

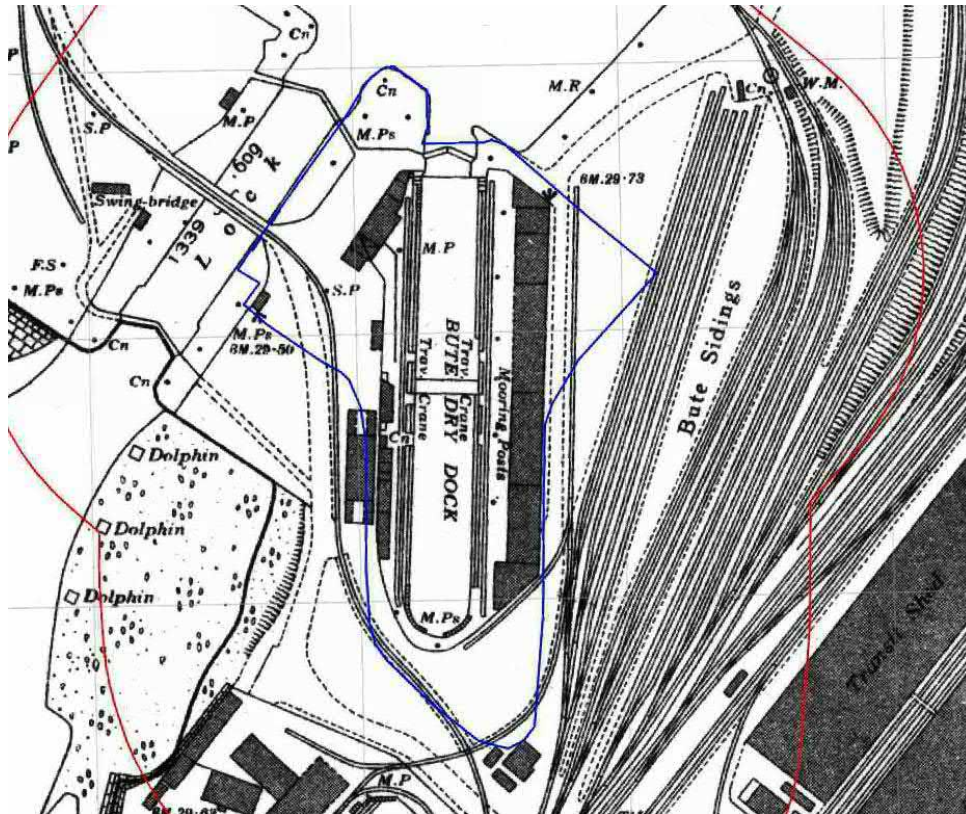


Figure 8 - The Ordnance Survey 6": mile map of 1941

2.1.40. The Ordnance Survey 6": mile map of 1941 (Figure 8) shows some minor changes have occurred within the site, including the demolition of the two buildings which lined the roadway to the west of the dock, one of which includes the small construction which abutted the arched throughway. Travelling cranes are now depicted on to the east and the west where rows of rail are located longitudinally along the dock. The extensive sidings to the east of the site have been reconstructed and are now labelled as 'Bute Sidings'. These extend in a south-west to north-east alignment to Coal Hoists on the Roath Basin. The changing nature of the movement of coal from tightly linked Coal Staithes to crane operated coal hoists more sparsely distributed marks the changing technologies involved at Cardiff Bay and ports in general. While the buildings along Bute Dock remain associated with a single set of rails to the east, it would appear that this has been reconstructed further away from the buildings themselves and without a turntable which has evidently been removed. Large transit sheds have been constructed 100m south of the site around a Customs Excise Office to the east of Channel Dry Dock.

2.1.41. These developments and technological upgrades were likely needed, as perhaps a result of the increased demands placed upon the dry dock following the onset of the Second World War. Alongside the other dry docks, as well as Cardiff Docks rival ports at Barry and Bristol, the dry dock was in near constant use for wartime services. As during the previous war, Cardiff became a nexus for US aid and military deployment; Bute Dry Dock and other docks regularly became witness to the ‘Liberty Ships’ which moved vehicles, men and their munitions from Britain to Normandy following Operation Neptune in June 1944 (Richards, 2008). Its importance was also recognised by the German Luftwaffe, who produced preparatory reconnaissance plans on 29th August 1939, five days prior to British declaration of war, which directly highlighted Bute Dry Dock (labelled as ‘D’; Figure 9) as an important bombing target (Imperial War Museum, ref: LBY LUFT 1925).



Figure 9– Luftwaffe reconnaissance of Cardiff Docks, August 1939 (Imperial War Museum, 2023)

2.1.42. In addition to its primary industrial functions, Bute Dry Dock was used for more specialised operations. In particular, Roath Basin, the Roath lock and Bute Dry Dock were used by Captain Bill Pritchard as a training ground for Operation Chariot, a planned raid on the Louise Joubert dry dock at Sainte-Nazaire, a dock in Brittany which was intended to house the German battleship *Trippitz*. Due to its large size, Bute Dry Dock served as an adequate simulation for a replica of the HMS *Campbelltown*, the ship which later was successfully armed with high explosives and rammed into the Sainte-Nazaire dry dock in March 1942, losing half its crew (including Captain Pritchard) during the operation (Morgan, 1998).

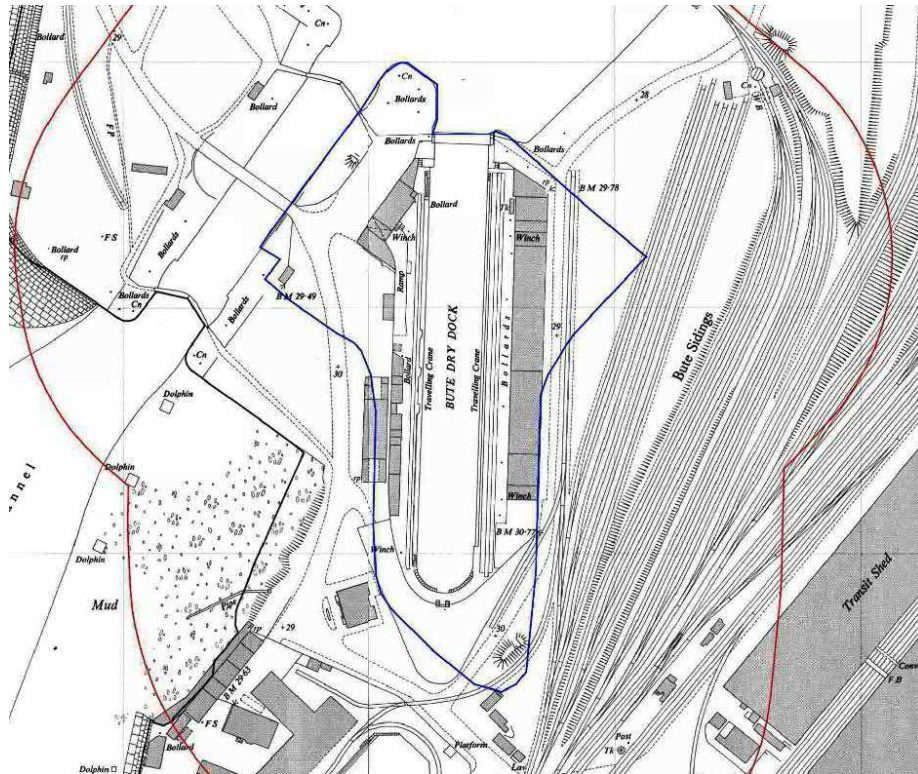


Figure 10– The Ordnance Survey 6”: mile map of 1951

2.1.43. Following the end of the war, Cardiff Dock’s began to fall into a gradual and prolonged state of decline. In 1948, the docks were taken into public ownership under the British Transport Commission, who took over the docks increasingly falling imports of coal, which had dropped to 736,174 as of 1947, roughly 14% of its exports ten years prior (Richards, 2008). Despite this, Bute Dry Dock remained operational under Channel Dry Dock Co, and was later acquired by the company C. H. Bailey who also bought rivals Mount Stuart Dry Docks at a similar time (Richards, 2008). As the Ordnance Survey 6”:

mile map of 1951 (Figure 10) shows by this time the buildings remain in relatively the same format, however, four winches are depicted with two to the east and two to the west. The lock gates between the dry dock and the Roath Basin have been replaced by the steel caisson which was seen at the time of the site visit for this report. A small row of stairs has been constructed to the south of the dock leading from what appears to be road level to the dock side. The travelling cranes remain.

- 2.1.44. There are minor changes to the buildings within the site. The long building along the western extent at the south end of the dock is being shown as a having been divided into smaller units and is now conjoined with the building to the immediate north. A new building aligned north-west to south-east has been constructed at the southern extent of the arched throughway, and the path fronting is labelled as a ramp. Other infrastructure is labelled, and a winch can be seen to have been present on buildings located at the north-west, north-east, and southern end of the east ranges. Bollards are shown to have been more numerous on the eastern extent, suggesting damage limitation was needed more here than the east which only had two. This may reveal that the buildings along the eastern extent were associated more with the movement of goods and materials.
- 2.1.45. The decline in coal and iron only further increased during the mid-20th century, with the final coal shipment having left the Queen Alexandra dock, in 1964 (Richards, 2008). The declining coal exports were subsequently redirected to the competition at Barry and Swansea, leading to the abandonment of the former Taff Vale and Rhymney Railway lines next to Bute Dry Dock. This factor in combination with the increased size of container vessels which were too large to be handled by Cardiff's historic dockyards, meant that Bute Dry Dock began the slow decline to becoming obsolete. In reaction, speculative plans were drawn up by the National Ports Council in 1965 to either expand the existing locks into Roath Basin, north of Bute Dry Dock, or possibly reclaim further areas of Cardiff Bay, but neither proved feasible (Glamorgan Archives, ref. DABP/4/7/89). Regardless, Bute Dry Dock still managed to house the tankers that did arrive due to its size. One such tanker was the 12,351-tonne ore carrier Cape Nelson (Figure 11), one of the largest ships ever held in Cardiff docks (O'Neill, 2001).



Figure 11– Workers watching the Cape Nelson in Bute Dry Dock in May 1967, looking north (O'Neill, 2001)

- 2.1.46. A photograph dated to 1967 (Figure 11) shows the historic dockyard whilst still in use. Although dated nearly a century after the construction of the Bute Dry Dock, the photograph shows a number of buildings around the site which were only present in the form of remains of footings at the time of the site visit. The photograph shows five workers at the dock, four of which wear overalls, and leaning on a steel tubular railing. The photo is taken at the south of the site and looking north, where a large vessel is moored. On the east side a large brick building is present and displays large warehouse-style doors to ground level. Above a series of large windows are present across the elevation. It appears that the building has a fairly shallow pitched roof and possibly a skylight by the apex running north south. At the north end of the dock on both the east and west extents, the buildings have a pitched roof. At the western extent these appear to have possibly been weatherboarded elevations. At the south end of the western extent the building is a single storey brick construction with a flat roof and small regularly spaced windows, possibly representing more of an administrative building. The majority of the industrial activity appears to be taking place along the eastern extent, as was suggested by the number of bollards shown on the 1951 map.
- 2.1.47. The photograph also shows the cranes on both sides of the dock having been formed of a fairly short lattice-work jib with a simple glazed cab.

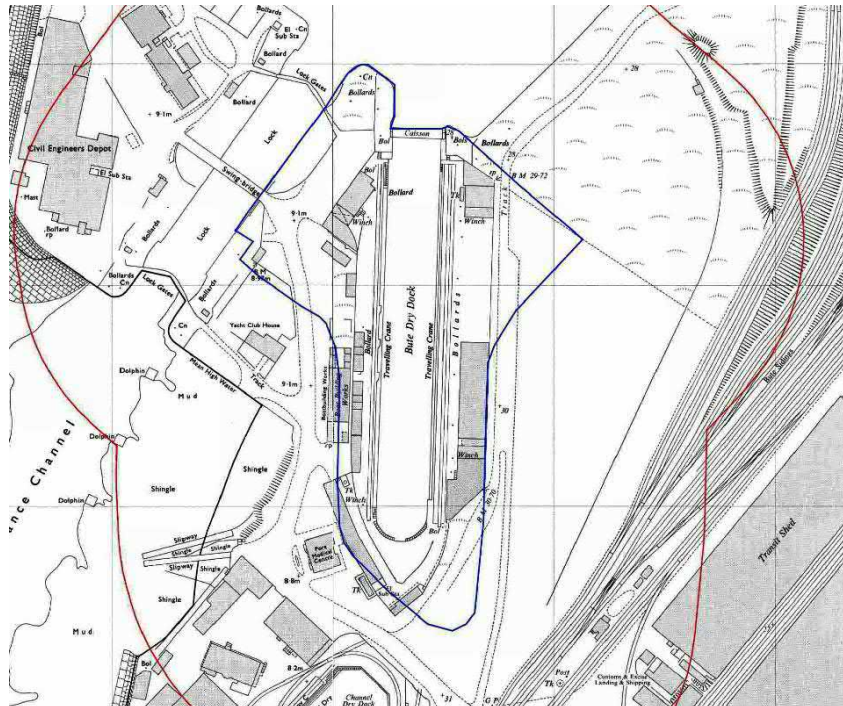


Figure 12- The Ordnance Survey 1:2,000 map of 1969

- 2.1.48. The stagnation of the historic docks and the effect of the operational redirection is evident in the Ordnance Survey 1:2,000 map of 1969 (Figure 12). The map shows that one of the large warehouses along the eastern extent has been demolished, and a new building has been constructed immediately adjacent which aligns north-west to south-east. Another ramp has been constructed to the south of the site which leads down to the docks in a north-eastern direction. Existing buildings to the west of the site are now labelled as 'Boat Building Works' while further towards the south-west of the site a long warehouse is located partly within the site boundary and this contains an electrical substation to the south, again partly within the site boundary. Outside of the site boundary is the 'Port Medical Centre' which is located above slipways to the Channel Entrance. On the opposite side of the lock and swing bridge a Civil Engineers Depot has been constructed. To the east of the site, the extensive rail sidings have been removed and the rail which served the buildings of Bute Dry Dock have been replaced by a track.
- 2.1.49. The industry at the Cardiff docks continued to decline throughout the 1970's and 1980s, and in 1981 Associated British Ports (ABP) was established to take over operations and monitor the new flow of global exports which included grain, wire and steel and imports from Scandinavia, Russia and the Middle East (Richards, 2008). Despite remaining in operation under the C. H. Bailey company and taking in larger modern tanker vessels, the buildings around Bute Dry Dock were increasingly falling into disuse (Briggs, 2002). This is illustrated in a photograph (Figure 13), dated to the 1970s, which views Bute Dry Dock from the north-side of Roath Dock. The photography shows the angular buildings to the

dry docks north-west labelled with their owners ‘C. H. Bailey’ banner. The buildings environs are shown to have become increasingly overgrown and unkempt, although the buildings still seem to be remaining in operation with placards and advertisements over windows. Looming behind can be seen the large Essi Flora Oslo, a Norwegian owned chemical tanker and bulk carrier ship which had a gross tonnage of 12,056, which is docked in Bute Dry Dock (Bekkevold, 2006).



Figure 13– Bute Dry Dock with the ESSI Flora Oslo chemical tanker, viewed from Roath lock in the 1970s, looking south-east (Briggs, 2002)

2.1.50. The Ordnance Survey 1:2,000 map of 1979 (Figure 14) shows that the warehouse to the east of Bute Dry Dock has been replaced and that the adjacent roadways to the south and west are now known as Locks Road. The map shows an electrical substation has been constructed within the north-east corner of the site, and large sections of land have been given over to as a depot for the Metropolitan Railway company, to the south-east, outside the site boundary. Along the south-east extent of the Roath Basin where a coal staithe was previously situated, a travelling crane is depicted.

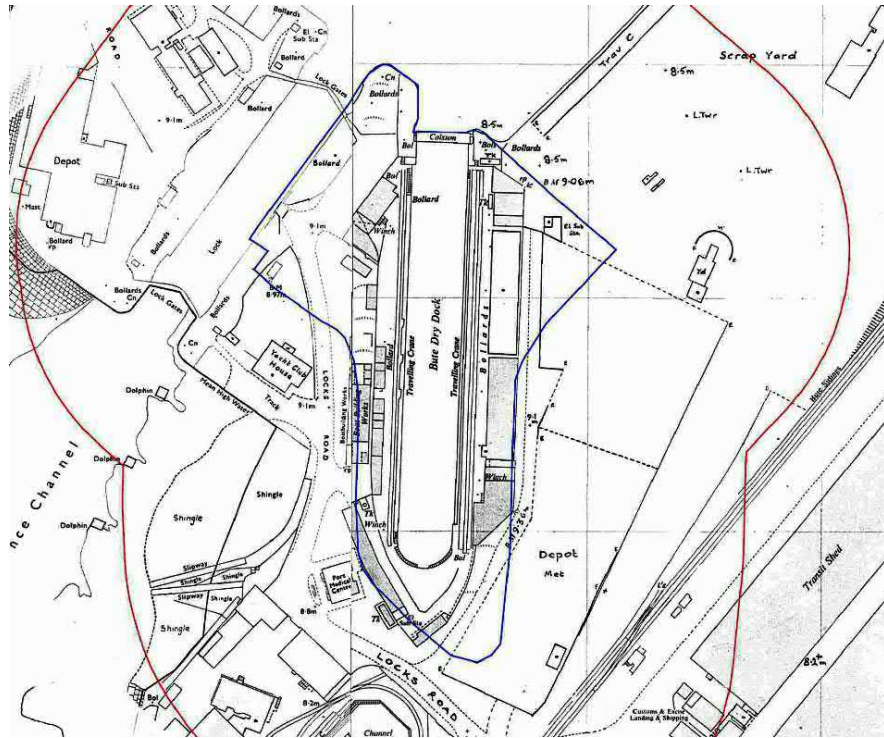


Figure 14– The Ordnance Survey 1:2,000 map of 1979



Figure 15– Bute Dry Dock with M.V. Ouraniotoxo docked in 1979, looking north (National Museum of Wales, 2023)

2.1.51. A photograph dated to 1979 depicts the buildings alongside the dock in operation and the ship M. V. Ouraniotoxo docked during her year-long stay (Figure 15). The northernmost eastern warehouse building is two-storey appears to have a shallow gradient metal

corrugated gabled roof with skylights and a railed gangway, that is surmounted by multiple circular vents. Its lower storey has a wide doorway and a small shed on its southern end, and its upper storey is penetrated by numerous vertical windows. More widely, the photograph also shows us a glimpse southernmost building at the eastern extent, that was obscured by a travelling crane in the photograph from 1967 above (Figure 11). This building can be seen to have been constructed of brick and comprised large windows on the upper storey with warehouse style openings beneath. The building is typical of late 19th century warehouses and likely dated to the original phase of construction. In addition, we get a closer look at the condition of the single-storey brick buildings west of the building, which are situated directly ahead of a two-storey corrugated warehouse (labelled as 'Bute Building Works' on the 1979 OS Maps; Figure 14), all of which are seemingly still in operation. It also provides a clear glimpse into the dry dock when not filled with water. It clearly shows the stepped ledge on the inside of the dock wall (known as an altar) which line the upper third of the dry docks western and eastern edges and shows their abrupt ending upon reaching the flat edges of the southern end of the dry dock and stairways. It also gives an idea of how would ships would operate and manoeuvre within the dry dock, seemingly being moved by a linear system of elevated wooden rollers which runs central within the docks base. In addition, the travelling cranes have seemingly been upgraded to larger modern versions.



Figure 16– 'Iberian Coast' in Bute Dry Dock in 1987, looking north (Glamorgan Archive, ref. D788/1/5)

2.1.52. The dock remained in operation during the 1980's, docking merchant vessels such as the 'Iberian Coast' in 1987 and the 'Otto Danielson' in 1989, both illustrated in historic photographs held by Glamorgan Archives (Figures 14, 15 & 19). The two photographs from 1987 associated with the works on the 'Iberian Coast' gives a clear image of the state

of the buildings on the western side of the dock, as well as showing the still operational travelling crane, previously illustrated in 1967 (Figure 11). The 1987 (Figure 16) image gives us a closer insight into warehouse in the sites north-eastern corner, which consists of a two-storey building, with a corrugated low gradient roof. It has a large door on northern end of its western face and like its neighbouring warehouse, its first storey is rendered in white paint.



Figure 17– Photo showing ‘Iberian Coast’ docked in 1987, with mobile crane and buildings east of dock, looking north-west (Glamorgan Archive, ref: D788/1/6)

2.1.53. This warehouse and its southern neighbours, as is illustrated in the second photograph, now also have a white rendering on their first storey (Figure 17). Besides the greater amount of detritus and overgrowth along the base of the buildings, very little has changed since the previous illustration and, according to the reverse of the second image, the functions of this buildings still remained industrial in nature. The caption reads ‘5. 3. 92 / Bute Dry Dock, Cardiff / on the right’ and then list of functions reads as ‘storer, fitting shop, plumber’ and a ‘boilermakers’ (Glamorgan Archives, ref. D788/1/6). Although it is unclear in which order these should be read, it is most logical to apply the headings in a left to right direction. With the largest warehouse on the left, it is most likely that was intended for

storing goods, whilst the oldest 19th century building on the far right would still likely be used as a boilermaker, which likely had been its function since construction.



Figure 18– Bute Dry Dock with unknown ship in 1987, looking south (Glamorgan Archive, ref. D788/1/2)

2.1.54. Another photograph in 1987 with an unknown ship (Figure 18) give further detailed insights into the dry dock when drained. It shows an unknown ship at the docks southern end, again mounted upon the same wooden rolling platform as last seen in 1979, but this time surrounding by an arrangement of wooden blocks. These are presumably employed for hold the ship steady and elevated for works on their hulls. This image also gives a clearer indication of the altars, a set of which can also now be seen lining the western and eastern walls of the docks base. This image also us our first close look at the three internal projecting columns, intended to hold the caisson at the dry docks centre (McConnochie, 1884). The three on the western wall project outward and appear fully intact, whereas, in contrast, the three on the eastern wall are less prominent, with their projections only appearing up the first upper altar. This aligns with the historic OS Maps, particularly before 1941 (Figure 8), which show altars extending out beyond the projecting columns. This photograph also gives us our first glimpse of the rectangular structure to the dry docks south-west, which appears to be a single storey structure with multiple blue doors, presumably for storage.



Figure 19– Workers in Bute Dry Dock, working on the ‘Otto Danielson’ vessel in 1989 (Glamorgan Archive, ref. D788/1/4)

2.1.55. An additional photograph taken in 1989 (Figure 19) gives us an interior view of the dry dock with several workers working on a docked vessel. To their left is the now the visibly large wooden roller system, given scale when compared to the size of the workers. It was evidently capable of being disassembled as two legs and a set of rollers have been removed immediately in front of the workers, seemingly to allow fixtures to be mounted onto the ship’s hull with ease. Image also shows a brightly coloured ship positioned against the western wall (as surmised from the western stairway in the photographs back left). Although somewhat obscured by scaffolding, it would appear that it is held in an off-set position by a wooden beam, giving an insight into the multi-ship capabilities of the dry dock even into its later life. This close insight all illustrates how the dock walls are comprised of the original stop blocks, with the dock floor being covered by possible square tiles.

Closure & redevelopment

2.1.56. From 1987 onwards, the Cardiff Bay Development Corporation (CBDC) was founded with the goal of redeveloping the dilapidated docks for commercial and residential use, which included the areas surrounding Bute Dry Dock (Glamorgan Archives, ref. D1026/4/2/9). The dry dock was one of the only surviving ship repair and maintenance business still operational in Cardiff and its owner C. H. Bailey (from whom the company got its name) rejected initial attempts by the ABP and CBDC to develop around business, citing incompatibility of with their ‘paint spraying and grit blasting’ activities (Glamorgan Archives, ref. DCBDC/1/8/2/48). Notably, he protested against the construction of the Cardiff Bay Barrage, newly being developed west of the site (Environmental Advisory Unit Ltd, 1991),

and petitioned in the UK Parliament against the overarching Cardiff Bay Barrage Act 1993 (UK Government, 2023). It would appear; however, that he did not intend to use these protests purely to maintain his maritime enterprise, but instead to secure more favourable conditions for the sale of the dry docks. In fact, the owner Mr. Bailey willingly proceeded with the sale of his other properties at Mount Stuart Dry Docks, north of the site, to the CBDC for the development of the National Techniquet earlier in the 1990s; he even directly suggested to the CBDC Management Team that the ‘easy way out’ was for the CBDC to buy his ‘freehold interest’ of Bute Dry Dock so he could concentrate on investments elsewhere (Glamorgan Archives, ref. DCBDC/1/8/2/48).

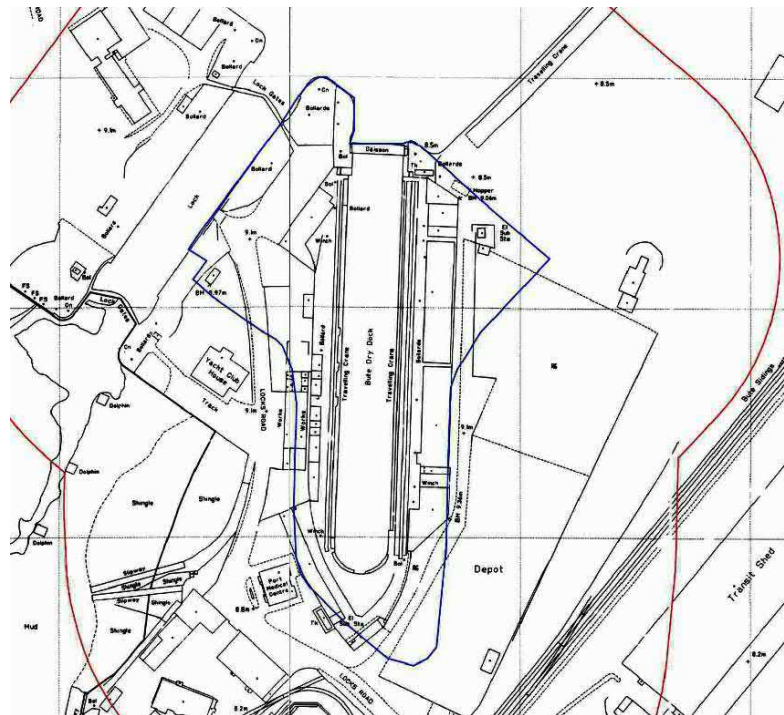


Figure 20- The Ordnance Survey 1:2,000 map of 1992

2.1.57. The Ordnance Survey 1:2,000 map of 1992 (Figure 20) shows the site relatively unchanged from its last cartographic iteration, although a has now small rectangular ‘hopper’ has been constructed within the north-east of the site. Very little changes around the site until the early 2000s, when aerial photography shows significant changes around the dock. Despite attempts to open negotiations, it would appear operations continued whilst residential and commercial redevelopment began around the site. On the north-western side of the Roath Lock, a new rectangular building was constructed, earthen bank now forming a crossing.



Figure 21- Aerial photograph taken in 2000. Image: Groundsure

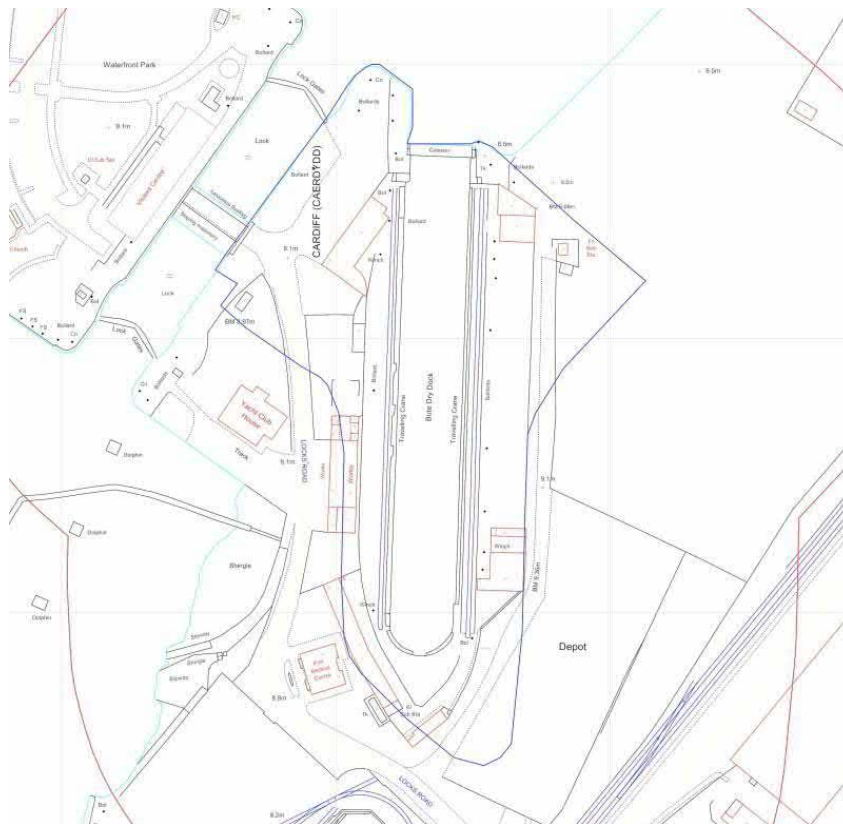


Figure 22 - The Ordnance Survey 1:2,000 map of 2003. Image: Groundsure

2.1.58. As the Ordnance Survey 1:2,500 map of 2003 (Figure 22) shows this building had become a visitors' centre and the bridge over the lock had been reinstated in 'Sloping masonry', most likely to demolition and construction vehicles who were operating around the site. By this date most of the buildings along the eastern and western extents had been demolished, but some of the operational tools like the travelling crane remains extant as do the bollards. In 2004, C. H. Bailey finally managed to negotiate the sale of the Bute Dry Dock to Quada (Dockside) amongst other parties and left the ship building industry entirely to refocus his efforts on the overseas leisure and manufacturing industries (Evans R. , 2004).

2.1.59. By 2008 (Figure 23) aerial imagery shows that, for the most part, all remaining buildings associated with Bute Dry Dock have been removed with the exception of partial remains of the buildings walls and there appears to be some of the original footings from the dock's ancillary buildings which remain *in situ* below ground level. The angular exterior walls of the building to the west remain extant and are lined with shrubs. To the east, the varying levels of the docksides remain intact as they do to the west and the south where the ramp is located. To the south and the east of the site area the sidings and built-up areas have been cleared and given over to patchy grassland. However, industrial warehouses remain to the south-east lining Queen Alexandra Dock.



Figure 23- Aerial photograph taken in 2008. Image: Groundsure.

2.1.60. Aerial imagery from 2013 (Figure 24) shows that there has been further demolition of the buildings surrounding Bute Dry Dock. While these possibly remain *in situ* below ground level, the upstanding walls have been removed to the west of the dock with the exception of a brick building which remains halfway along the dock. Outside of the site area, roadways have been paved around the site boundary as they appear today, and the surrounding land parcels have been developed with new industrial buildings and

associated carparks, including the BBC Roath Lock Studios to the east which opened in 2011 (Colfein NPRN: 420402). Importantly, a new bridge has been built over the lock to the west of the site and this is located south-west of the previous bridge which still contains an earthen bank.

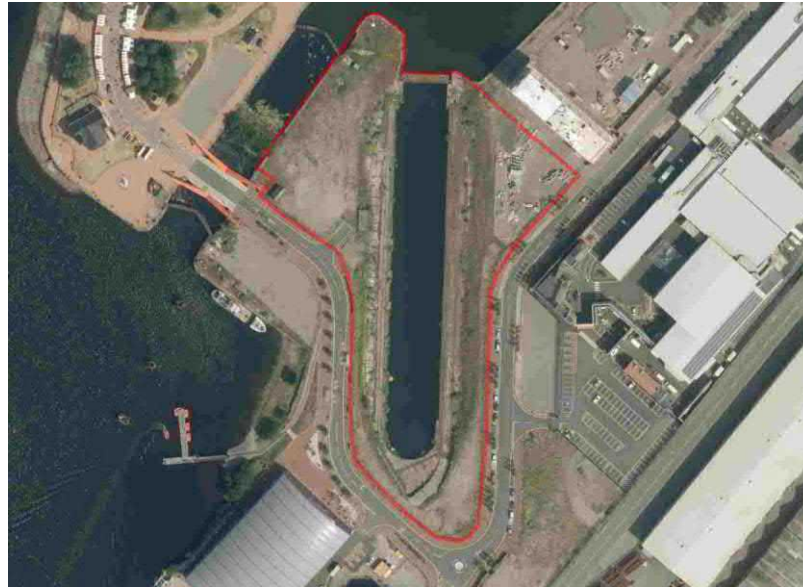


Figure 24- Aerial photograph taken in 2013. Image: Groundsure

2.1.61. Aerial imagery from 2017 (Figure 25) shows further development of the site area with paved carparks constructed to the east and west of the dock and a new public footbridge at the north of the dock, above and separate to the caisson. The site appears as it does today.



Figure 25- Aerial imagery taken in 2017. Image: Groundsure

3 Technical Description

3.1 Introduction

To be read in conjunction with Drawing 1, 4 & 5

- 3.1.1. The dock was approximately 180m long and 26m wide. The northern half was bound by Roath Basin to the north, and by modern paved carparks to the east and west that were adjoined by a modern publicly accessible footbridge. The caisson was located underneath and immediately north of the footbridge. The southern half of the dock compound was bound on all sides by Porth Teigr Way.
- 3.1.2. Construction of the Bute Dry Dock began in 1882 and was completed by 1885 when the first vessel entered the dock. The dock was originally lined by ancillary workshops, warehouses and plant rooms which had been demolished in the late 20th and early 21st century. However, the terraced sides of the dock remained partially intact immediately surrounding the structure including the partial remains of some of the surrounding buildings. The remaining dock compound was partially covered by grass and low vegetation. At the time of recording the Bute Dry Dock was decommissioned and was filled with water to a level approximately 2m lower than the adjacent Roath Basin (Figure 26-28).

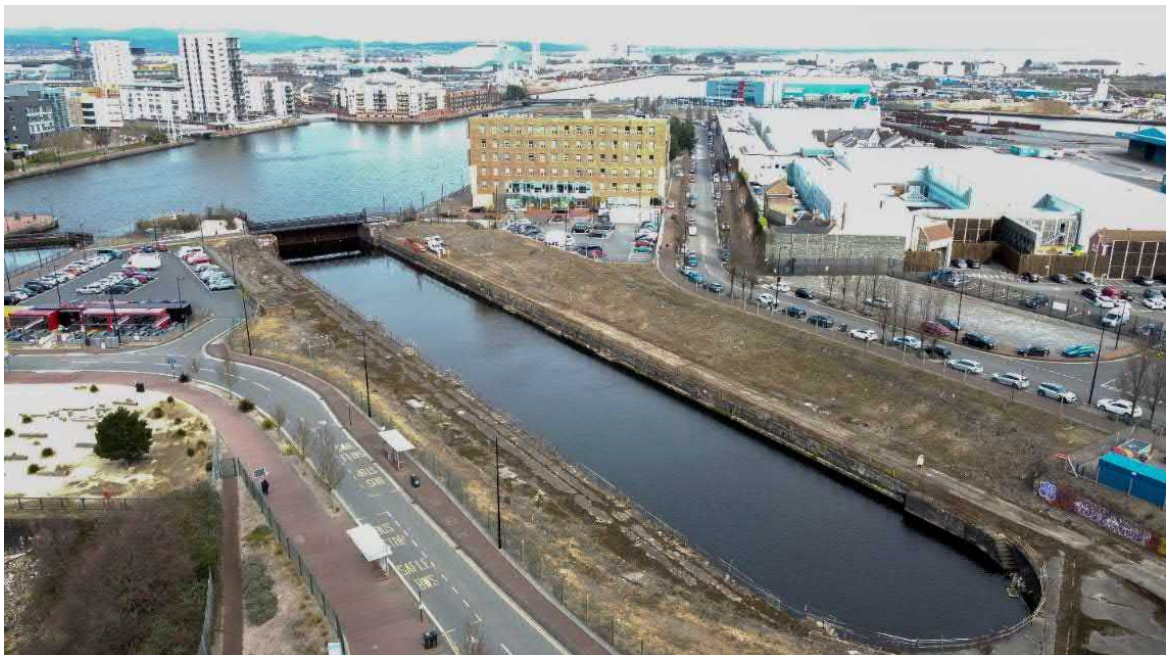


Figure 26- Bute Dry Dock, looking north-east towards Roath Basin.

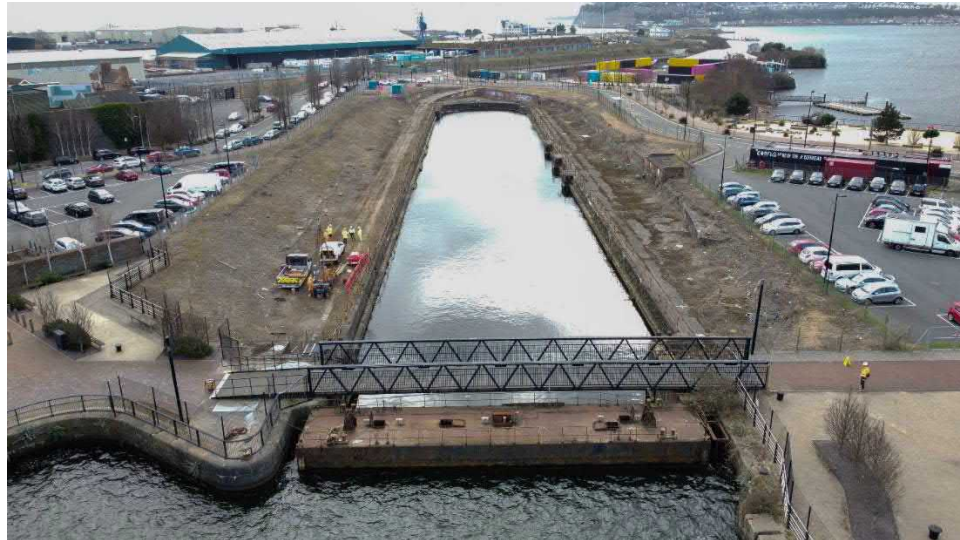


Figure 27- Bute Dry Dock, looking south.



Figure 28- Bute Dry Dock, looking south-east.

Caisson (North Wall)

- 3.1.3. The caisson to the north of Bute Dry Dock was a rectangular structure formed in steel that aligned east west and measured approximately 23m x 4m (Figure 29 and Figure 30). The top deck of the caisson was lined by a railing and contained a several fixtures and fittings. These comprised four double bitt bollards and four sets of valve wheels, two at either end of the caisson. Five hatches with hatch combing were located on the deck, four of which provided access to the chambers within while one, located in the centre, provided access to plant and services. A windlass located at either end of the caisson tethered the vessel to the dock to the west and east. On the interior aspect of the dock, the caisson formed a

seal against a row of large quoin stones. Based on visual inspection only, the caisson was typical of the mid-20th century in style.

- 3.1.4. The water levels at the caisson measured approximately 2m higher outside the dock in Roath Basin to the north, than inside the dock itself. An inspection of the caisson below the water line (Kaymak Marine and Civil Engineering, 2018) revealed that there was extensive corrosion and pitting to the north and south of the structure, with additional delamination to the south.



Figure 29– The Bute Dry Dock Caisson, looking south south-west.

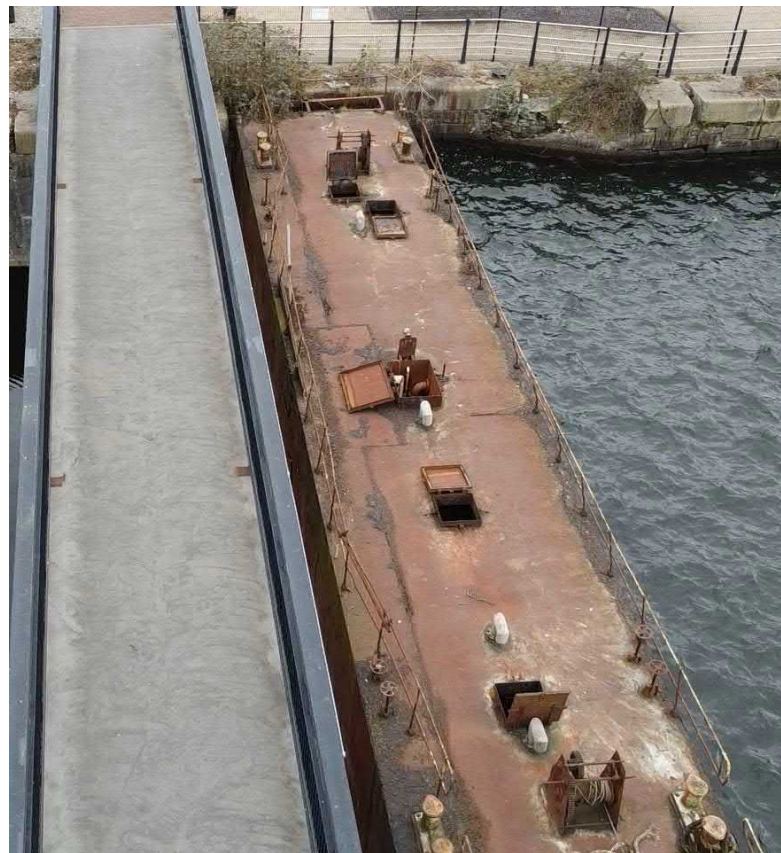


Figure 30– The Bute Dry Dock Caisson, looking west.

- 3.1.5. The footbridge over the Bute Dry Dock and caisson was constructed sometime between 2013 and 2017. It comprises a beam bridge that's structurally separate from the caisson and links the carparks to the west and east of the dock (Figure 31).



Figure 31– The caisson and footbridge, looking west.

East Wall

To be read in conjunction with Drawing 2-A and 2-B

- 3.1.6. The east wall of the dock comprised a straight dock edge measuring approximately 170m in length from the caisson to the curved south wall. Exposed above the water line the dock wall comprised an ashlar masonry construction clad in cement render sometime in the 20th century, presumably for repair and maintenance (Figure 32). The cement render was formed in courses of shuttering, which near the top of the dock, contained horizontal sections measuring 600-670mm high and 15m long. Below this, intermittent areas of cement render covered the original masonry which otherwise remained visible near the water level. The original masonry was most clearly visible in an altar exposed above the water line to be 400m wide and 1.5m down from the dock edge (Figure 32).
- 3.1.7. Protruding from the altar were three supports that provided recesses for the caisson to be placed mid-way along the dock structure to allow more than one vessel to be worked on within the dock at one time. These measured 5m wide, 1m deep and were flat to the north where the caisson would have been positioned. Spaced 10m apart, the northern-most support was located approximately 76m from the caisson and this matched similar supports on the west elevation. However, these extended from the top of the dock rather than the top altar. These continued to the base of the dock.
- 3.1.8. The edge of the dock did not contain curbing but was lined by railings approximately 1m high. This was formed over a single uniform level except for the northern-most 10m of the

dockside which contained a large supporting abutment for the caisson immediately adjacent (Figure 33 and Figure 34). This abutment measured 8m across from east-west and was comprised by large concrete blocks with two sets of stairs: one leading southward from the level of the caisson to the dockside, and another leading southward the top of the dock to the base. This was reconstructed was reclad in concrete sometime in the 20th century, most likely between 1941 and 1951 which the original iron gates to Bute Dry Dock were replaced by the current caisson (Phase 2). Set within the top of the concrete supports was a double bitt bollard to the south-west which would have been used to moor vessels within the dock. Recessed within the structure was a steel pipe which extended east west and then down the east wall. A scar is present on the eastern-most abutment which suggests the presence of a large feature, likely associated with infrastructure. It is possible that a large mooring post or small immobile crane was mounted here, but no evidence could be found to confirm.

- 3.1.9. Recessed elsewhere along the east wall of the abutment were services comprising drainage pipes (Figure 33 and Figure 34).



Figure 32- The east wall exposed above the water line showing services within a cement render cladding (20th century) and ashlar masonry exposed at the altar (original), looking east.



Figure 33- The northern supports of the east dock wall, looking north.



Figure 34- The northern supports to the east dock wall, looking north-east.

3.1.10. Beyond the dry dock, the compound to the east comprised a low sloping bank - It seems that any bollards or mooring fixtures had been removed from the dock edge, along with the travelling crane plant that was originally located near the dock edge and the buildings to the east.

South Wall

3.1.11. The south wall of the dock was formed in ashlar masonry and was semi-circular in plan (Figure 35 and Figure 36). Two sets of staircases were built into the curving walls to the east and west, which led southwards to the bottom of the dock. An intact section of masonry was observed to the south of the dock on a section of the east wall containing stairs leading south to the bottom of the dock (Figure 35). Both the sides of the dock and the stairs were partially lined by railings approximately 1m high. Figure 35 shows the southern end of the dock and the masonry construction. Vegetation has grown from the walls of the dock and the remaining railings are visible along the dockside.



Figure 35- The southern end of the dock, looking south.



Figure 36- The southern end of the dock, looking south.



Figure 37– Orthomosaic showing the southern end of the dock, looking south. Note: the slight curvature is indicative of the curved dock walls



Figure 38- Ashlar masonry forming the staircase supports to the south of the dock, looking east.

- 3.1.12. Beyond the dry dock, the compound to the south comprised two levelled terraces separated with an angular red brick retaining wall (Figure 39). This contained an access ramp to the east which led down from the upper terrace to the lower terrace nearest to the dockside in a north-easterly direction. The southern approach to the dock was reconstructed sometime between 1954 and 1969 when a ramp to the north-west of the dock was removed. This reconstruction involved the reconfiguration of the upper terrace, which was previously semi-circular, to an angular design, coinciding with the removal of the extensive rail sidings east of the dock, and a new ancillary building to the south-west which lined the dock in a north-west to south-east direction (now removed). The ramp and lower terrace were paved in large concrete slabs and the red brick retaining walls contained graffiti.



Figure 39- The southern end of the dock showing the ramp, looking south-east.

West Wall

To be read in conjunction with Drawings 3-A and 3B

- 3.1.13. The west wall of the dock was formed in ashlar masonry and comprised a straight dock edge measuring approximately 170m in length from the caisson to the curved south wall (Drawing 4). This was formed over a single uniform level except for the northern-most 10m of the dockside which contained a large supporting abutment for the caisson immediately to the north (Figure 40). The abutment was formed in large stone blocks with cement render cladding the western face underneath the footbridge. Unlike the abutment to the east, this was 5m across from east to west and was capped by sandstone blocks. The abutment had a curved south-east corner where a double bit bollard was located, and this would have been used to moor vessels within the dock. These supports contained two sets of stairs: one leading southward from the level of the caisson to the dockside, and another leading southward the top of the dock to the base.



Figure 40- The northern abutment on the west wall, looking west.

- 3.1.14. Exposed above the water line, was a narrow altar approximately 1.4m below the dock edge which was 400mm wide. Ashlar masonry was exposed along the west wall and recessed within the wall were services comprising drainage pipes.
- 3.1.15. In the centre of the dock, three supports provided recesses for the caisson to be placed mid-way along the dock structure to allow more than one vessel to be worked on at one time. These measured 5m long, 1m wide and were flat to the north where the caisson would have been positioned. Spaced 10m apart, the northern-most support was located approximately 76m from the caisson. These continued to the base of the dock and matched similar supports to the east. However, those to the east protruded from the first altar only.
- 3.1.16. The MBES LiDAR survey showed the presence of two wells positioned along the west wall at the base of the dock. The historic accounts of the dock from 1884 describe these as pumping wells which were associated with two centrifugal pumps on vertical shafts 4ft in diameter, powered by two horizontal non-condensing engines that would have drained the north or south parts of the dock when the (now removed) central caisson was in position.

4 Discussion & Conclusion

- 4.1.1. The archaeological building record of Bute Dry Dock conformed to a 'level 3' report as specified by Historic England and agreed upon by Cardiff Council and Cadw. The visible parts of the dock, and the areas inundated by water, were surveyed using drone and supported by LiDAR survey results which enabled us to document various construction and architectural details.
- 4.1.2. Bute Dry Dock is Grade II listed as part of the wider Roath basin at the Port of Cardiff and is a significant remnant of the Cardiff ports, representing an earlier industrial landscape and as a surviving remnant of the port's history.
- 4.1.3. Despite the demolition of nearly all of the buildings associated with the Bute Dry Dock, three main phases of construction and modification were elucidated using through an analysis of the historical fabric and documentary material:
- **Phase 1 – Construction (1885)**

The original construction of the Bute Dry Dock which took place between 1882 when permission was granted by parliament to the 'Trustees' of the Marquess of Bute in the Bute Dock Act 1882 to 'extend their Docks and Railways' and 1885 when construction was completed by Chief Engineer John McCoonochie. The first ship entered Bute Dry Dock on the 22nd January 1885 (Glamorgan Archives, ref. D746).
 - **Phase 1a– Possible Extension (<1905):** The widening of the dock which was first referred to in the accounts of 1905 (BHO, 2023) and describe the proposals to extend the width of the dock. Although it is unclear when (or if) this took place, the eastern dock wall showed modifications in the form of cementitious render. If this is the case then the work likely took place quite a while after the 1905 account, as the cement render was typical of the mid-20th century- perhaps between 1930 and 1950. This delay could be explained by the First World War having interrupted any work and labour resourcing. As the dock was filled with a deep body of water, it was not possible to confirm this.
 - **Phase 2 – Caisson replaced (1952)**

Sometime between 1941 and 1952, the original caisson at the north end of the dock was replaced. The original gates were likely to have been formed of iron, based on the practices of iron work during the late 19th century. The replacement extant floating caisson was constructed of steel and was formed of typical mid-20th century style. It is likely that the eastern support to the caisson, which is formed of concrete, was constructed during this period.
 - **Phase 3 – Southern ramp constructed (1969)**

By 1969, the southern end of the dock had been reconstructed to its extant layout, which included an angular retaining wall constructed in red brick, with a ramp leading

down to the dock. The original ramp which was located on the north-west side of the dock was likely removed during this period.

- 4.1.4. The building record has addressed the following research questions put forward by the WSI to help elucidate further information about the building's historical narrative, and to contribute to a wider archaeological research framework for the Archaeology of Wales (IFA Wales/Cymru, 2008) by identifying new information concerning Wales coastal infrastructure:

What is the potential for the preservation of original fixtures and fittings associated with the dry dock to be present within the structure, which is currently obscured by the body of water which fills it?

- 4.1.5. This building record has identified a number of original features, importantly, the three caisson supports mid-way along the length of the dock structure which were found to extend below the water line to the bottom of the dock. A caisson positioned in the middle of the dock would have allowed more than one vessel to be worked on at any given time, with the inner-most vessel requiring perhaps more work and a longer stay in the dock on the hard stand. Interestingly, this coincided with two separate wells at the base of the dock which were evident on the MBES LiDAR survey and historic accounts of the dock from 1884 when the dock was being built. These were pumping wells which were associated with two centrifugal pumps on vertical shafts 4ft in diameter, powered by two horizontal non-condensing engines that would have drained the north or south parts of the dock when the central caisson was in position. Few other original features appear to remain apart from the large and substantial ashlar walls of the dock itself which remain exposed in areas not reclad in cement render. Due to the deep body of water present, it was not possible to confirm the presence of other fixtures or fittings at sub-surface level.

What is the physical nature of the mechanism or system that links the caisson and Bute Dry Dock?

- 4.1.6. A floating caisson was present at the north end of Bute Dock, between it and the Roath Basin. This replaced earlier iron chevron style gates sometime between 1941 and 1951, as evidenced through historic mapping. The fixtures on the deck of the caisson suggest that this was contemporary to the mid-20th century and built as part of Phase 3. The earlier caisson that was seen on historic maps as having been present at mid-point of the dock structure was no longer present, although caisson supports were still extant on the west facing elevation of the dock wall. The replacement caisson was of the floating type which allowed for it to be moved to various positions within the dock, to accommodate vessels of different sizes.
- 4.1.7. At the time of the site visit, a fairly substantial stream of water was entering the dock from the north-west corner of the caisson, where a gap possibly caused by erosion was seen.

Can the documentary record of Bute Dry Dock and the associated Roath Basin complex contribute to what is understood of the earlier harbours in the south-east Wales area, which were later abandoned and replaced by the large industrial-period ports?

- 4.1.8. The primary documentary record for Bute Dry Dock is often fragmentary and difficult to analyse in isolation, due to its detachment from its originally complex naval environment. The most notable example of this is Bute Shipbuilding, Engineers, and Dry Dock Company's annual meeting minutes book (Glamorgan Archives, ref. D746), which often makes abbreviated references to ledgers and records which originally would have been closely associated with it but are now presumably lost or in private ownership. Some primary documentary resources can be incredibly illuminating as to what is currently understood. The account by John McConnochie, the Chief Engineer of Bute Docks, for the Institution of Mechanical Engineers has been surprisingly underutilised. The facts he presents seemingly distilled down into secondary literature (see discussion below), but he is rarely mentioned in secondary literature, despite him providing a detailed in-progress account of the wider docks construction and being an important local figure (McConnochie, 1884).
- 4.1.9. The secondary documentary discussions can provide, at best, a good context for deep research into individual early docks but should not be relied upon for detail. Bute Dry Dock serves as a good example of this, as despite being the longest operating dry dock in Cardiff, it is rarely mentioned in any of the most comprehensive secondary studies. Both John Richard's *Cardiff: A Maritime History* or John Hutton's *An Illustrated History of Cardiff Docks* (Vols 1.-3) mentioned it simply to highlight the activities and assets of the Bute Shipbuilding, Engineering and Dry Dock company or the development of the wider Roath Basin. It is also often used to provide setting for historic events, for example, when Dennis Morgan uses it to tell the story of *Operation Chariot* (Morgan, 1998). When researched more deeply, most of their interpretations and facts are, despite being detailed, lacking in proper citation and are occasionally wrong. Hutton, for example, gives the specific dimensions of Bute Dry Dock originally being originally 55 feet wide, and later extended up to 71 foot 6 inches (Hutton, 2008). This is clearly a misreading of McConnochie's originally 1884 report for the Institution of Mechanical Engineers which says Bute Dry Dock had an entrance '55ft. in width' but was actually '600 ft. long, 87 ft. wide at top' (McConnochie, 1884).
- 4.1.10. When combined, the documentary evidence suggests Bute Dry Dock and the wider Roath Basin complex were constructed by the Bute Trustees and the Bute Shipbuilding, Engineers, and Dry Dock Company, which separated as individual enterprise of the 3rd Marquis of Bute, John Patrick Crichton-Stuart, who funded the quays initial construction (Richards, 2008). This was as part of the wider trend to monopolise upon the increasing trade of coal and iron from South Wales's interior, which was using the nearby narrow

Glamorganshire Canal, and occurred in tandem with the expansion of the Taff Valley Railways, who leased the quays for this purpose (Richards, 2008). Bute Dry Dock then continued to operate as an industrial dry dock, servicing the numerous ships of who exported primarily coal and iron, as well as prestigious international guests and traders, including the Japanese delegation for the coronation of King Edward VII in 1902 (Institution of Mechanical Engineers, 1906). Alongside all the other Cardiff docks, it may have suffered from the decreasing exports of coal in the Inter War period, but it managed to endure to the early 2000s seemingly because of its size, position, and capabilities. The dock was already being commended in 1906 by contemporary engineers for its size (Institution of Mechanical Engineers, 1906), which, according to the Bute Shipbuilding Co's. Minutes, could have possibly been cunningly expanded for future demand (Glamorgan Archives, ref. D746). Well into the 1960s and 1970s, the docks' size allowed visitor tanker ships including the Cape Nelson (12,351-tonnes) and the Essi Flora (11,449) to be housed (Bekkevold, 2006), and allowed it to continue taking in sometimes multiple smaller vessels well into the 2000s.

Using documentary sources and through the on-site investigation of historical fabric, what comparisons can be made with other national (and possibly international) sites of a similar nature in their historical use, design and appearance, as well as their present-day status? How have similar sites been treated post-closure?

- 4.1.11. The design of dry docks across the UK had evolved to mirror developments in ship design. Until the end of the 19th century most ships had curved hulls, so dry docks were built with curved or semi-circular cross-sections, with stepped walls (known as "altars") as seen on the interior walls of Bute Dry Dock. These altars were built in to support the wooden props which held the hull of a vessel in place. The shape and form of Bute Dry Dock appears similar to other commercial dry docks built during the peak of industrial shipping between the late 19th and early to mid-20th century. For example, a similar site constructed in 1924 on a larger scale was Palmers Dry dock in Swansea (**Plate 4-1**), which comprised altars and chevron style caisson gates. Palmer Dry Dock is presently known as Prince of Wales Dry Dock 2 and is in use as a commercial ship repair and ship recycling facility as part of the Swansea Dry Docks (Swansea DryDocks, 2023). Another example of a similarly sized dock is the Grade II listed Central dry dock / Sand Southend Wharf (NHLE: 1375866) in Hull. This dry dock is less formally known as Hull central Dry Dock and was constructed in c.1820 for Gleadow's Shipyard which specialised in the construction of new wooden boats. It was later extended in c.1875 on order to take on larger iron vessels. Today, Hull Central Dry Dock has been fitted is host to Stage @TheDock, which describes itself as a: "a stunning multi-purpose venue as unique and ambitious as the city in which it resides. Emerging from the bed of the old dry dock, looking onto the River Hull & Humber Estuary, with wonderful views of The Deep and set in the heart of the thriving Fruit Market area of Hull" (The Stage @The Dock, 2023). The Stage has an impressive 350 capacity pioneering open air venue which has been made available to the community, businesses,

and other groups for a diverse range of events and performances as a unique space (**Plate 4-2**). This project forms a part of the Fruit Market Regeneration project at Hull (Fruit Market Hull, 2023)



Figure 41 - View of Palmers Dry Dock gates from the Kings Dock, Swansea, circa 1924 (Swansea and Port Talbot Docks History, 2023)



Figure 42 - Hull Central Dry Dock (Historic England, 2023)

The Archaeological Research Framework for Wales identifies a complication that many nineteenth century port engineering drawings have been disposed of and no longer exist. Is it possible to identify any previously unknown drawings for the Roath Basin Complex and the associated Bute Dry Dock, either held by public institutions or by private collectors/bodies?

- 4.1.12. Documentary sources were catalogued with an accession number relating to the Glamorgan Archives, and no uncatalogued documentary material was found as part of the research stages.
- 4.1.13. Our research did, however, find an error with an archived plan at the Glamorgan Archives relating to ‘Annotated plan of Bute Dry Dock and Queen Alexandra Dock’ (Glamorgan Archives, ref. DABP/4/7/68). This was listed as having related to the proposed dock extensions that were described in May 1900 in the Bute Shipbuilding, Engineering and Dry Dock Co’s management documents (Glamorgan Archives, ref. DABP/4/7/68). The Annotated plan is currently listed by the archive as dated to around 1900, however upon further study, the arrangement of the railway sides revealed a date of around 1920s is more correct. Historic mapping has shown the railway sidings were laid east to west in 1901, terminating near Bute Dry Dock’s north-eastern corner. However, the alignment of the railway sides after 1920 matched those illustrated in the Annotated plan of Bute Dry Dock and Alexandra Dock, i.e. north-south in increasing numbers.

Can the documentary analysis of the Bute Dry Dock contribute to the understanding of the use of river supply routes, and the wharfage of medieval strategic sites such as castles and towns?

- 4.1.14. Since Bute Dry Dock was not built until 1882-1885, the dry dock does not provide any direct evidence for our understanding of medieval supply routes, however it does allow us to further contextualise the gradual expansion of Cardiff south from its medieval core through suburban growth and land reclamation southwards to its present size, and potentially gives us a useful comparison tool.
- 4.1.15. The dry dock is situated within the Roath Basin complex of quays, which were artificially expanded over the shallow marshes within the Severn Estuary, as of result of the inefficiencies of Cardiff’s existing maritime infrastructure in the early 19th century. Prior to this expansion, the docks consisted of the Glamorganshire Canal (built in 1794), which followed parallel with the River Taff and was already an improvement on the river leading inland, upon which Cardiff’s original docks were situated (2.7km north-west of the site). Its position further inland kept it close to the nucleated centre of the settlement, which began surrounding the Roman fortress and later around the fortified castle, primarily for defensive purpose, but also for closely monitored administration, which was evidently highly sought after as the towns burghers increasingly grappled for self-governance in 1340 through charters with Lord Hugh Despenser (BHO, 2023).

What can an investigation of Bute Dry Dock contribute to the present understanding of the use of Welsh shores for trade and settlement patterns, as well as the development of the coastal infrastructure of ports, harbours, and of coastal and estuarine navigation systems?

- 4.1.16. Bute Dry Dock appeared as an artificial expansion onto the marshland at the mouth of the River Taff, which led up to Cardiff's originally sheltered docklands. By the time it was built in the 1880s, the demands for industrial expansion had necessitated that new land be reclaimed from the salt marshes, which only a century prior had been considered uninhabitable.
- 4.1.17. A consideration of Bute Dry Dock and its continued, largely unaltered, usage for shipbuilding, maintenance and repairs, provides an intriguing paradigm through which to view the evolution of Welsh industry. The dry dock was one of the first docks originally built because of the demand for the exportation of iron and coal, which were struggling to move through the existing Glamorgan Canal. It witnessed multiple alterations to its surrounding topography whilst remaining unchanged as these industries ebbed and flowed, the prime example being the arrival of new railway sidings for the Taff Valley (and later Cardiff Railway Company) lines. The OS maps show these railway lines expanding and contorting rapidly through the late 19th and 20th centuries, gradually disappearing as the inland coal mines in the Rhondda Valley which necessitated them closed. In their stead now sits entirely contrasting buildings, including the BBC Studios and sites of local tourism, demonstrating the increasing shift in from heavy to service industry in Cardiff.
- 4.1.18. Another good example is the Channel Dry Dock immediately to the Bute Dry Dock's south-west, which opened in the 1890s seemingly as an emulation of its predecessor. Since export demand was initially very high, it was felt necessary to expand the local graving dock capabilities; gradually, however, as the wider Welsh heavy industry declined so too did the businesses who owned each respective dock. During times of increasing struggle, the once independently flourishing competitors who would merge into one, eventually falling entirely under the larger C. H. Bailey conglomerate who would later own all surrounding dry docks and would struggle to maintain the increasingly dilapidated buildings surrounding them all. Despite beginning life as one of the first and later superseded dry docks, it would manage to endure until 2004 as only surviving graving dock of its generation.

Can any Welsh boat-building traditions, geographical traditions, or traditional industrial activities (such as slate, copper, and coal mining) be identified within the historical narrative of the Bute Dry Dock? If not, what patterns could be identified over a wider landscape.

- 4.1.19. The coal and iron industry were certainly important to the development of Bute Dry Dock. The very construction of the dock and the wider Roath Basin was, in part, a response to the emergence of the industrial revolution and the growing export of coal in which Cardiff,



Glamorgan and wider Wales was instrumental. The owners of the dry dock, Bute Shipbuilding, Engineers and Dry Dock Co., are recorded as being 'iron founders' in 1901 (Trades' Directories Limited, 1901), so direct consumers and producers of local resources for the construction of Welsh ships. By 1913, the peak of 13 million tonnes of coal was being shipped from Bute Docks (Richards, 2008), with the dry dock continuing to act as a significant player in those exports, and even as these exports gradually reduced, Bute Dry Dock continued to servicing the changing nature of ships who traded in the dock. From the 1950s onwards, Bute Dry Dock was one of the only docks capable of housing some of the newer, larger tanker ships, notably the Cape Nelson and Essi Flora, who visited with imports from across the globe.

Appendix A

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Other sources

Glamorgan Archives, Cardiff



Architectural / Survey drawings

Drawing 1: Plan of Bute Dry Dock

Drawing 2-A: East wall of Bute Dry Dock

Drawing 2-B: East wall of Bute Dry Dock

Drawing 3-A: West wall of Bute Dry Dock

Drawing 3-B: West wall of Bute Dry Dock

Drawing 4: East – West cross section of Grade II listed Bute Dry Dock

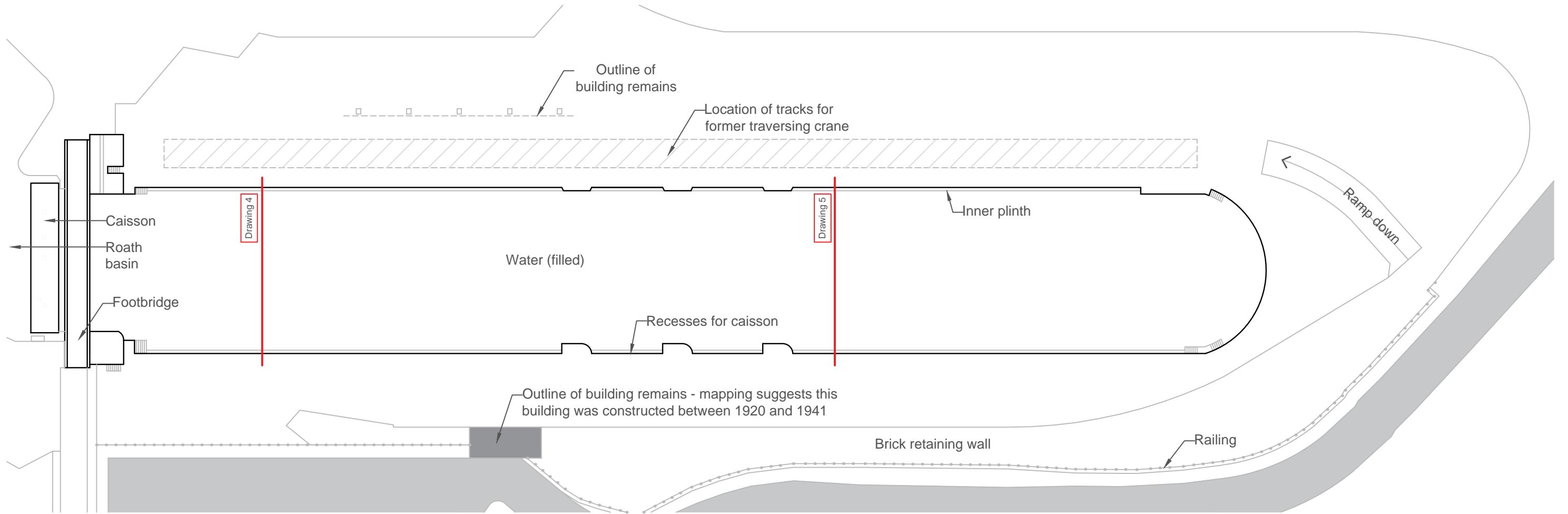
Drawing 5: East – West cross section of Grade II listed Bute Dry Dock

Appendix B

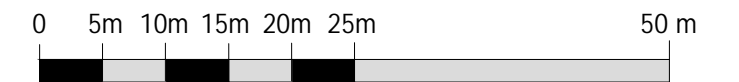
Drawings




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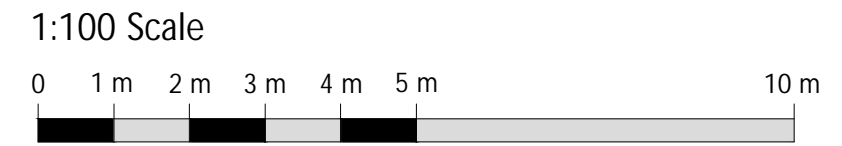
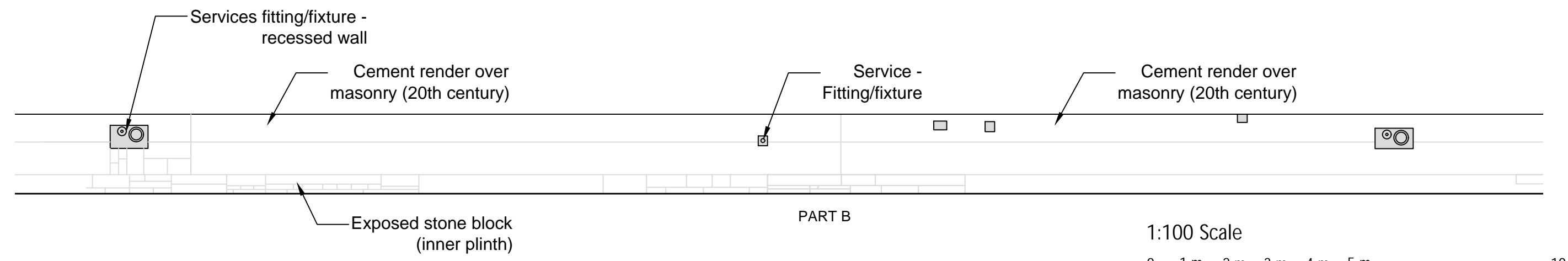
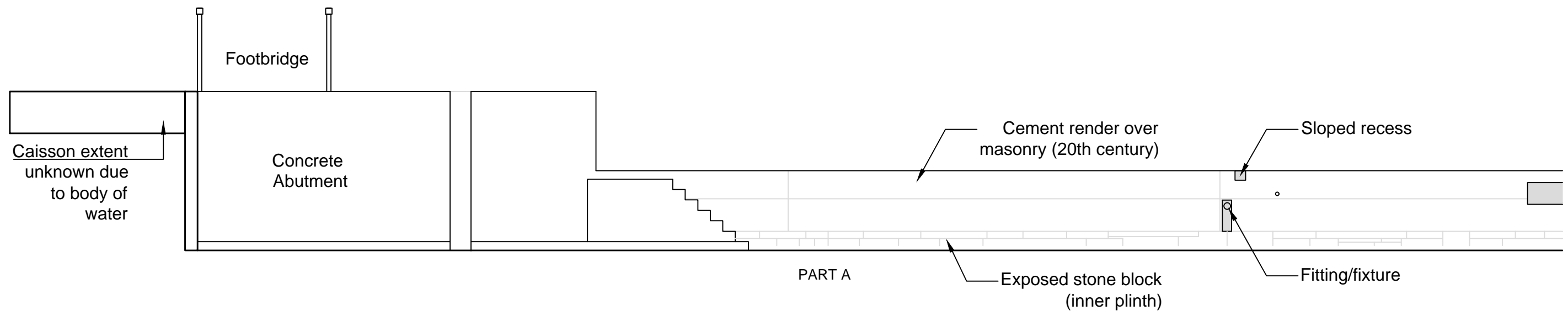
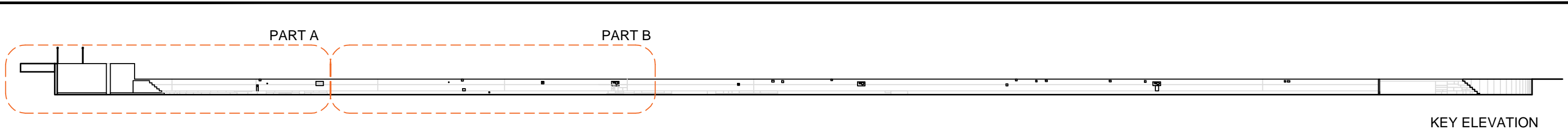


1:600 Scale



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| CLIENT: Welsh Assembly Government | | PROJECT No: 70043727 | DRAWN: AB | DATE: 08-JUNE-2023 | |
| DRAWING TITLE: Plan of Bute Dry Dock | | DRAWING No: Drawing 1 | | REV: 02 | |
| | | © WSP UK Ltd | | | |

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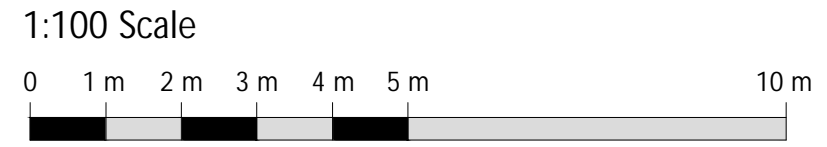
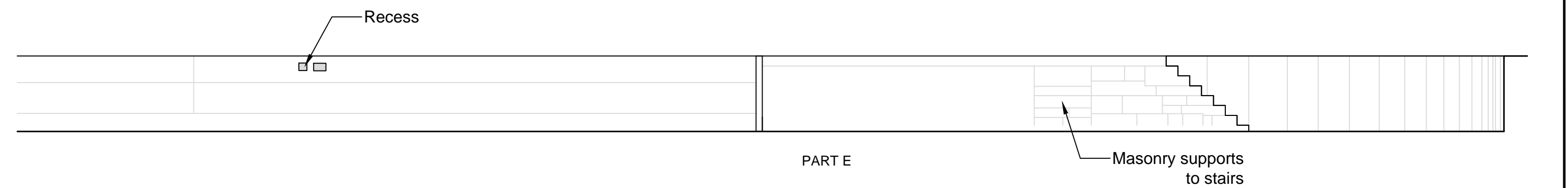
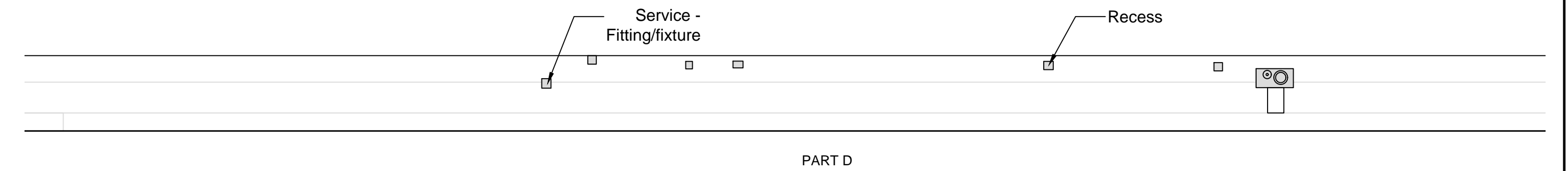
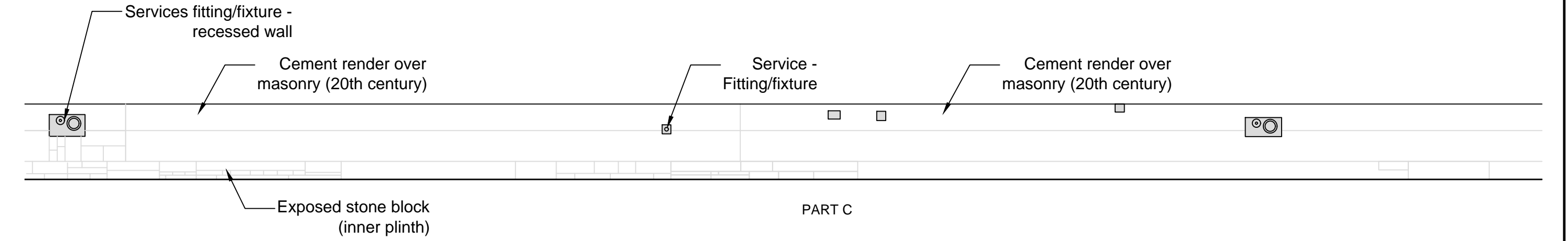
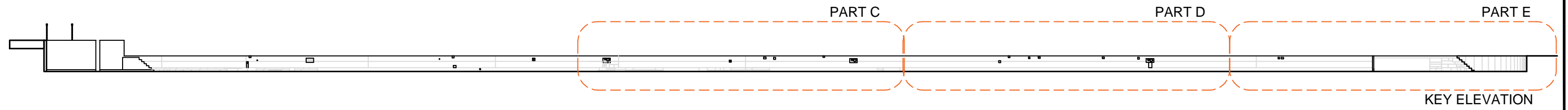



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| PROJECT: | Bute Dry Dock Historic Building Recording | |
| CLIENT: | Welsh Assembly Government | |
| DRAWING TITLE: | East wall of Bute Dry Dock | |

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| SCALE @ A3: | 1:100 | CHECKED: | LT | APPROVED: | AN |
| PROJECT No: | 70043727 | DRAWN: | AB | DATE: | 08-JUNE-2023 |
| DRAWING No: | Drawing 2-A | | | REV: | 01 |
| © WSP UK Ltd | | | | | |

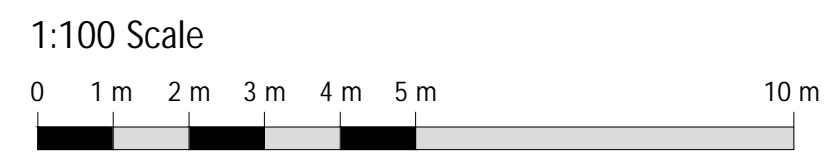
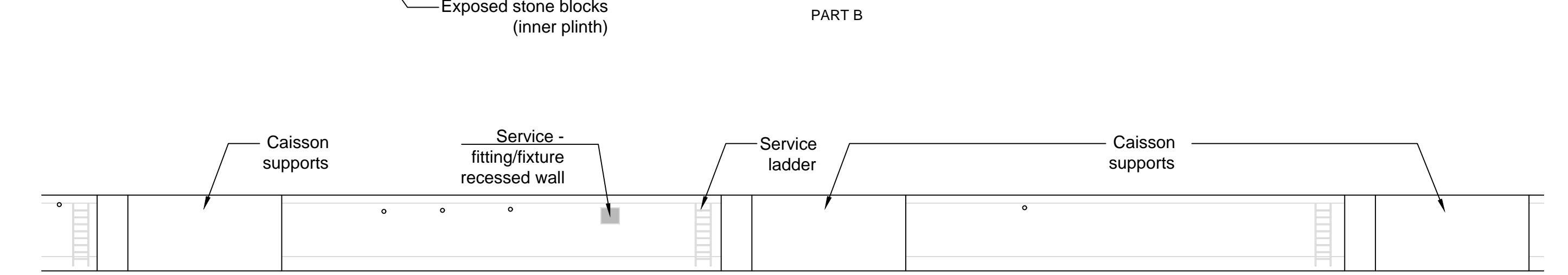
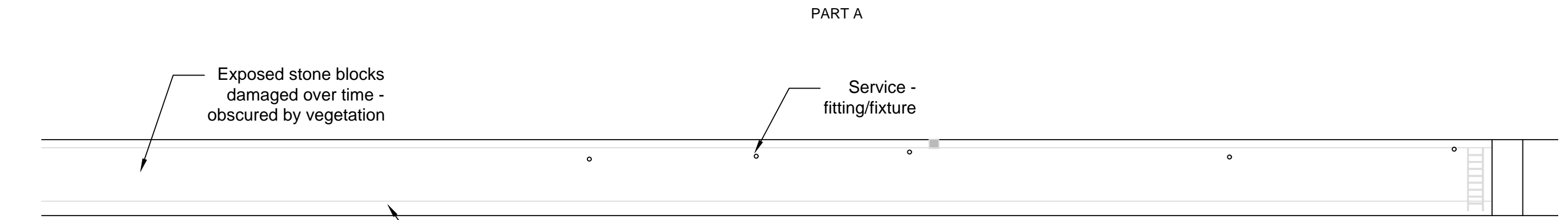
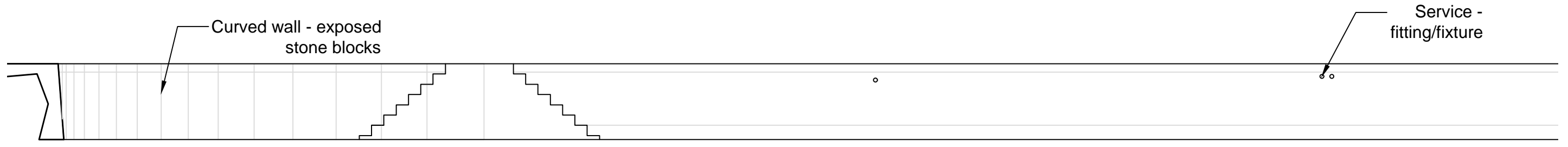
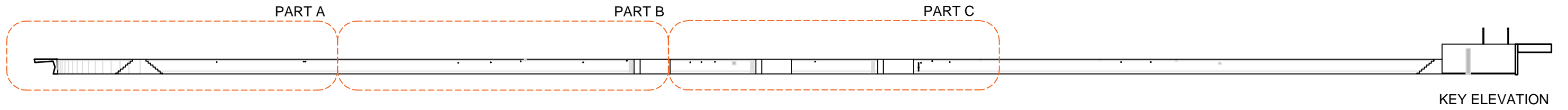
CONSULTANT

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| CLIENT: Welsh Assembly Government | | PROJECT No: 70043727 | DRAWN: AB | DATE: 08-JUNE-2023 | |
| DRAWING TITLE: East wall of Bute Dry Dock | | DRAWING No: Drawing 2-B | | REV: 01 | |
| © WSP UK Ltd | | | | | |

File name: \\UK\WSPGROUP\COM\UK\CENTRAL\ENVIRONMENTAL\ARCHAEOLOGY\WALE\BUTE DRY DOCK HBR 70043727\REPORT16 FIGSAUTOCAD DRAWINGS\DRAWING3.DWG, printed on 08 June 2023 12:54:14, by Bhogade, Avanti

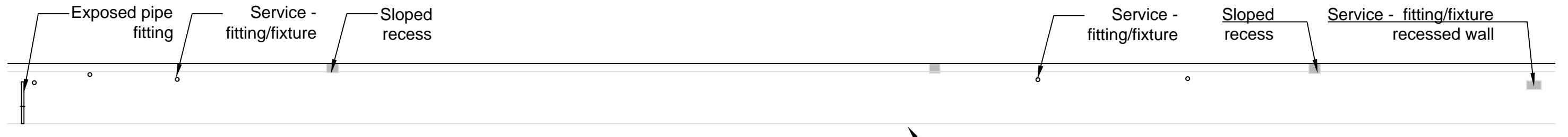
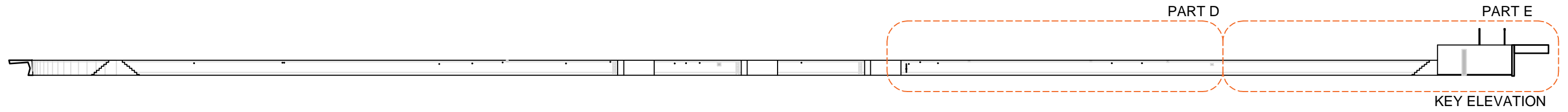


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| CLIENT: | Welsh Assembly Government | |
| DRAWING TITLE: | West wall of Bute Dry Dock | |

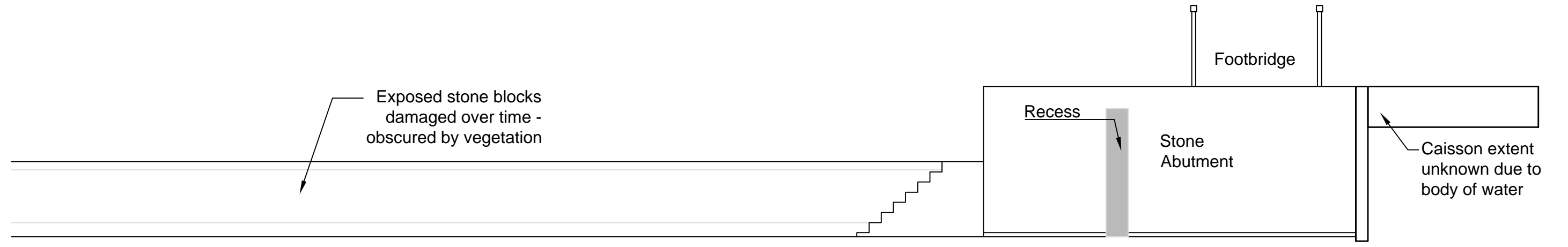
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| © WSP UK Ltd | | | | | |

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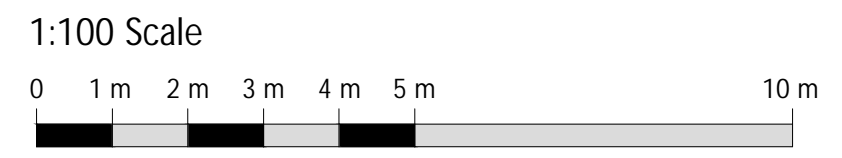
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PART D — Exposed stone blocks (inner plinth)



PART E



| | | |
|----------------|---|--|
| PROJECT: | Bute Dry Dock Historic Building Recording | |
| CLIENT: | Welsh Assembly Government | |
| DRAWING TITLE: | West wall of Bute Dry Dock | |

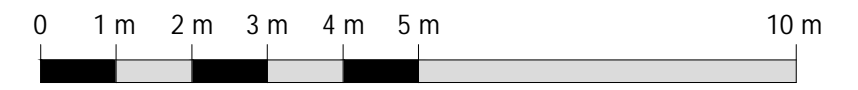
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| DRAWING No: | Drawing 3-B | | | REV: | 01 |
| © WSP UK Ltd | | | | | |


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File name \\UK.WSPGROUP.COM\UKCENTRAL\ENVIRONMENTAL\ARCHAEOLOGY\WALE\BUTE DRY DOCK HBR 70043727B REPORT\6 FIGSAUTOCAD DRAWINGS\DRAWING4_5.DWG, printed on 08 June 2023 12:55:44, by Brogade, Avanti



1:100 Scale



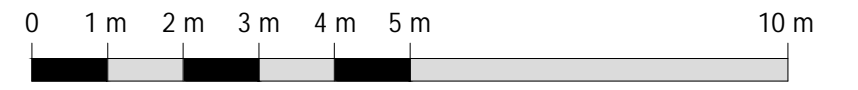
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| CLIENT: Welsh Assembly Government | | DRAWING No: Drawing 4 | DRAWN: AB | DATE: 07-JUNE-2023 | |
| DRAWING TITLE: East - West cross section of Bute Dry Dock (based on MBES data) | | REV: 01 | | © WSP UK Ltd | |

File name: \\UK\WSPGROUP.COM\UKCENTRAL\ENVIRONMENTAL\ARCHAEOLOGY\WALE\BUTE DRY DOCK HBR 70043727\REPORT16 FIGSAUTOCAD DRAWINGS\DRAWING4_5.DWG, printed on 08 June 2023 12:55:56, by Bhogade, Avanti



Drainage well

1:100 Scale



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|----------------|--|--|
| PROJECT: | Bute Dry Dock Historic Building Recording | |
| CLIENT: | Welsh Assembly Government | |
| DRAWING TITLE: | East - West cross section of Bute Dry Dock | |

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|--------------|-----------|----------|----|-----------|--------------|
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| PROJECT No: | 70043727 | DRAWN: | AB | DATE: | 07-JUNE-2023 |
| DRAWING No: | Drawing 5 | | | REV: | 01 |
| © WSP UK Ltd | | | | | |

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Appendix C

List of Photographs

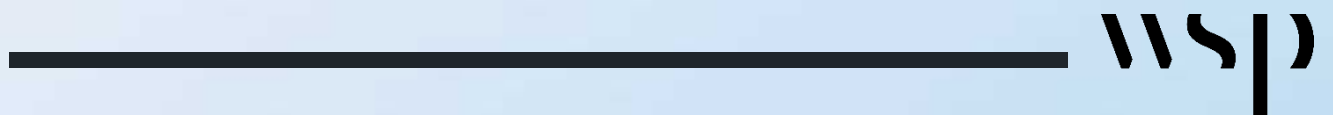
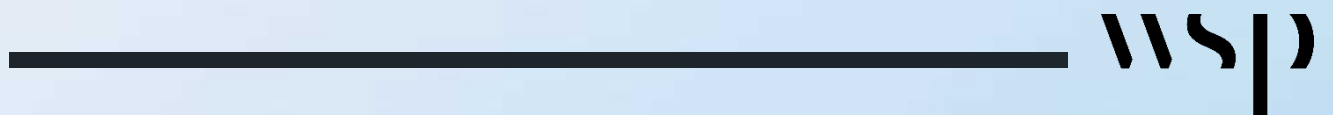


Table C-1 – List of photographs archived, using site code BDC22

| Archive no. | Photo no. | Description | Direction of view |
|-------------|-----------|---|-------------------|
| 1 | 001 | North end of Bute Dock with view of caisson | South-east |
| 2 | 002 | Caisson at north end of Bute Dock | south |
| 3 | 003 | View of Bute Dock | South south-east |
| 4 | DJI_0453 | View of Bute Dry Dock | South-south-east |
| 5 | DJI_0455 | View of Bute Dry Dock | South |
| 6 | DJI_0456 | View of Bute Dry Dock | South-west |

Appendix D

**OASIS: Archaeological report
archiving form**



Summary for wspenvir1-517371

| | |
|-----------------------------------|---|
| OASIS ID (UID) | wspenvir1-517371 |
| Project Name | Building Survey, Analytical Buildings Record (Level 3) at Bute Dry Dock |
| Sitename | Bute Dry Dock |
| Activity type | Building Survey, Analytical Buildings Record (Level 3) |
| Project Identifier(s) | BDC22 |
| Planning Id | |
| Reason For Investigation | Heritage management |
| Organisation Responsible for work | WSP Environmental Ltd, WSP UK Ltd |
| Project Dates | 14-Feb-2023 - 23-Mar-2023 |
| Location | Bute Dry Dock NGR : ST 19532 74178 LL : 51.46083454592883, -3.159650197578968 12 Fig : 319532,174178 |
| Administrative Areas | Country : Wales County : South Glamorgan District : Cardiff Parish : Butetown |
| Project Methodology | <p>WSP UK Limited (WSP) has been appointed by the Welsh Government (WG, the Client) to undertake a level 3 historic building record (HBR) of the Bute Dry Dock, Cardiff CF10 4GA (the site). The Bute Dry Dock and its surrounding area are owned by WG and fall within a Masterplan area known as Porth Teigr. It is proposed to develop a masterplan for the area immediately surrounding the dock, thus the dock itself will form a long-term and integral part of the planned redevelopment.</p> <p>The Bute Dry Dock formed part of wider Roath Basin complex that opened in July 1874 and was listed Grade II in 1992 (Cadw ref: 14062). It measured 190m x 29m and was formed in stone with altars c. 35m wide. The gate was located to the north and comprised a floating caisson which above water level was formed in steel. As part of the Roath Basin complex, it holds evidential and architectural value as a surviving example of a large mid-late 19th-century dry dock, a significant engineering feat with historical significance for its role in commerce and industry in Cardiff during the industrial evolution. It forms a group with the other assets included within the designation that comprises the adjacent Roath Basin, sea walls, dry docks and locks. These were constructed in the latter half of the 19th-century and together form part of the functioning port of Cardiff.</p> |
| Project Results | |
| Keywords | <p>Dry Dock - FISH Thesaurus of Monument Types</p> <p>Caisson - FISH Thesaurus of Monument Types</p> <p>Shipyards - FISH Thesaurus of Monument Types</p> <p>Dry Dock - FISH Thesaurus of Monument Types</p> |
| Funder | |
| HER | Gwynedd Archaeological Trust - unRev - STANDARD |
| Person Responsible for work | Luke, Tremlett |
| HER Identifiers | |
| Archives | |



4th Floor
6 Devonshire Square
London
EC2M 4YE

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