Vaizey's Wharf
Anchor and Hope Lane
Charlton
London SE7

London Borough of Greenwich
An archaeological assessment report
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SUMMARY (non technical)

Museum of London Archaeology (MOLA) and The Thames Discovery Programme (TDP) were commissioned by Adam Brossler of Jacobs Engineering UK Ltd., on behalf of their client the Environment Agency to record the foreshore at Vaizey's Wharf, Anchor and Hope Lane, Charlton, London Borough of Greenwich, SE7. The investigation took place in January 2011.

The work was carried out in advance of the replacement of the existing river wall which is in a very decayed state; work which may impact upon the remains of earlier timber river frontages.

Two wooden riverfront revetments were recorded which were constructed from re-used ships' timbers, one of which was associated with a concrete crane base. They probably dated to the period c.1856-1904/5. The latest appears to have fallen out of use during the 20th century and been replaced by a corrugated iron river wall, which has seen at least two phases of repair. Four of the timbers in the later revetment appear to have been pine deck beams from one or two of either an 18th or 19th century 3rd rate line-of-battle-ship or a large frigate, while the planking of the same revetment may possibly be deck planking from the same vessel(s).

The site itself was occupied from c.1856 by the Castle's shipbreaking concern and it is likely that these re-used vessel timbers were the result of their activity. As were those comprising three further structures in the near vicinity:

A platform had been built of approximately 100 surviving timbers, probably in 1904/05, from the *Duke of Wellington* (first rate, launched 1852), and at least one of *Hannibal, Edgar* and *Anson* (second rates, launched 1854, 1858 and 1860 respectively), and iron plates and lumps apparently from the proto-battleship *Ajax* launched in 1880. This stack butted up against the latest of the revetments with which this report is primarily concerned and thus post-dates it.

A slipway, located some 50m east of the site studied in this report, comprised approximately 80 re-used ships' timbers from at least three vessels of brig, sloop, corvette or frigate size. At present, it seems most likely that this structure was constructed between 1861 and 1885.

The revetment on the east face of Vaizey's Wharf is also partially comprised of re-used vessel timbers, probably warship side planking. As yet, no detailed work has been undertaken on this structure.

The timbers and structures recorded in this report, therefore, contribute to our understanding of a much larger site, comprising elements of a wider range of late 18th and/or 19th century warship types than any known archaeological site in the world.

This report also incorporates an assessment of the archaeological background of the site area.

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1 Introduction

1.1 Site background

The development site is situated in Greenwich (see Fig 1). It is bounded to the north by the Thames, to the south by a car park, to the east by Vaizey's Wharf and to the west by the foreshore below the Anchor and Hope public house.

The Ordnance Survey National Grid reference for the centre of the site is TQ 540945 179165. Within this report, the development area is referred to as 'the site'.

The proposed development is to replace the existing, decaying, river wall.

The Museum of London site code, by which the records are indexed and archived, is FGW 14.

The foreshore survey took place on the south bank of the River Thames (see Fig 1). The general area of this foreshore has been surveyed previously during the last two years by the Thames Discovery Programme, although no detailed work has been carried out on the specific area impacted upon by the proposed development.

Note: within the limitations imposed by dealing with historical material and maps, the information in this document is, to the best knowledge of the author and MOLA/TDP, correct at the time of writing. Further archaeological investigation, or more information about the nature of the present buildings may require changes to all or parts of the document.

1.2 Planning and legislative framework

1.2.1 National planning policy guidance

Planning Policy Statement 5: Planning for the Historic Environment (PPS 5) sets out the Secretary of State's policy on archaeological remains (heritage assets), and provides recommendations for local development plans. The key points in PPS 5 are summarised as:

> **Policy HE12: Policy principles guiding the recording of information related to heritage assets**
>
> HE12.1 A documentary record of our past is not as valuable as retaining the heritage asset, and therefore the ability to record evidence of our past should not be a factor in deciding whether a proposal that would result in a heritage asset's destruction should be given consent.

HE12.2 The process of investigating the significance of the historic environment, as part of plan-making or development management, should add to the evidence base for future planning and further the understanding of our past. Local planning authorities should make this information publicly available, including through the relevant historic environment record.

HE12.3 Where the loss of the whole or a material part of a heritage asset's significance is justified, local planning authorities should require the developer to record and advance understanding of the significance of the heritage asset before it is lost, using planning conditions or obligations as appropriate. The extent of the requirement should be proportionate to the nature and level of the asset's significance. Developers should publish this evidence and deposit copies of the reports with the relevant historic environment record. Local planning authorities should require any archive generated to be deposited with a local museum or other public depository willing to receive it. Local planning authorities should impose planning conditions or obligations to ensure such work is carried out in a timely manner and that the completion of the exercise is properly secured.

1.2.2 Regional guidance: The London Plan

The over–arching strategies and policies for the whole of the Greater London area are contained within the GLA's London Plan (Feb 2008) also include statements relating to archaeology:

Policy 4B.15 Archaeology

The Mayor, in partnership with English Heritage, the Museum of London and boroughs, will support the identification, protection, interpretation and presentation of London's archaeological resources. Boroughs in consultation with English Heritage and other relevant statutory organisations should include appropriate policies in their DPDs for protecting scheduled ancient monuments and archaeological assets within their area.

1.2.3 Local Planning Policy

The Borough of Greenwich Unitary Development Plan (UDP) was adopted in 2006. Policies D30 and D31 in the UDP state that:

D30 The Council will expect applicants to properly assess and plan for the impact of proposed developments on archaeological remains where they fall within 'Areas of Archaeological Potential' as defined on the constraints Map 10. In certain instances preliminary archaeological site investigations may be required before proposals are considered. The Council will seek to secure the co operation of developers in the excavation, recording and publication of archaeological finds before development takes place by use of planning conditions/legal agreements as appropriate.

D31 At identified sites of known archaeological remains of national importance, including scheduled monuments, there will be a presumption in favour of the physical preservation of the remains in situ and to allow for public access and display and to preserve their settings. For sites of lesser importance the Council will seek to preserve the remains in situ, but where this is not feasible the remains should either be investigated, excavated and removed from the site, or investigated, excavated and recorded before destruction. Appropriate conditions/legal agreements may be used to ensure this is satisfied.

Reason

6.50 Archaeological remains are a finite and fragile resource vulnerable to modern developments. PPG16 gives guidance on how archaeological remains should be preserved or recorded. It recommends that UDPs should include policies for the

protection, enhancement and preservation of sites of archaeological interest and of their settings, as well as a map defining where these policies apply. The Borough's archaeological heritage represents a local community asset that is desirable to preserve and utilise both as an educational and recreational resource. The objectives of new development can often conflict with the need to preserve, or to remove and record such remains. Potential developers should be alerted early on in the planning process of likely remains so as to secure their preservation. Early discussion with the Council and English Heritage is encouraged. The support of local archaeological groups is essential to this process. The potential for discovery of significant remains in large areas of the Borough is high, whilst the opportunity to record and preserve such finite resources is usually restricted to one occasion. The Greenwich Heritage Centre is a potential location for the retention of remains.

6.51 The Council will also:
i. Pursue land use policies which are sensitive to the potential threat development can pose to archaeological remains and adopt a flexible approach to the design of new development in areas where the preservation of archaeological remains is paramount.
ii. Encourage co-operation amongst landowners, developers and archaeological groups by promoting the principles laid down in the British Archaeologists and Developers Liaison Group Code of Practice.
iii. Encourage developers to allow an appropriate level of archaeological investigation
where significant remains are unexpectedly discovered during construction, and if applicable make provision for the preservation or recording of such finds by a recognised archaeological organisation.

The Greenwich UDP identifies a number of Areas of Archaeological Potential within the Borough, one of which encompasses the riverfront extending out to the low tide mark. The site, therefore, is situated within this zone.

1.3 Site status

The site does not contain any nationally designated sites, such as Scheduled Ancient Monuments, Listed Buildings or Registered Parks and Gardens. However, the site lies within an Area of Archaeological Potential defined by the Greenwich UDP, as mentioned above.

1.4 Origin and scope of this report

The archaeological work of assessment, analysis and recording were commissioned from Museum of London Archaeology (MOL Archaeology) and the Thames Discovery Programme (TDP) by Adam Brossler of Jacobs Engineering UK Ltd, on behalf of their client the Environment Agency. All archaeological analysis and recording during the investigation on site was done in accordance with the Museum of London *Archaeological Site Manual* (1994) and MoLAS *Health and safety policy* (2009).

This report presents the results of a foreshore survey carried out on the site during low tide windows between the 11th and 13th of January 2011.

1.5 Research aims

A number of research aims concerning the threatened structures were identified in the Written Scheme of Investigation[1]:

- Can we determine the extent of the structures?
- Can we determine the nature of the structures?
- Can we establish the date of the structures?

[1] Hoad & Wragg 2011: 9.

2 Methodology and sources consulted

For the purposes of this report sources, including the results from archaeological investigations in the vicinity of the proposed development and a study area around it, were examined in order to determine the likely nature, extent, preservation and possible significance of any archaeological remains that may be present within the site.

The following sources were consulted:

- Published historic maps and archaeological publications
- Internet - web-published material including Local Plan

The assessment was undertaken between the 11th and 13th of January 2011 as an 'Alpha Survey' pioneered by the Thames Archaeological Survey (TAS) and utilised by the TDP. It included plans and elevations drawn at a scale of 1:20, with selected diagnostic timbers drawn at a scale of 1:10, numbered individually, and recorded on timber sheets, in keeping with the evolved methodology developed by the TDP. A full photographic survey was also carried out. The assessment used survey points surveyed in to the site by MoLA geomatics during previous TDP surveys. Observations made on the site visit have been incorporated into this report.

2.1 Organisation of this report and conventions used

All dimensions are given in metres.

BGS	British Geological Survey
DCMS	Department of Culture, Media and Sport
DoE	Department of the Environment
EH	English Heritage
GLAAS	Greater London Archaeological Advisory Service
GLSMR	Greater London Sites and Monuments Record
MoLA	Museum of London Archaeology
MoLAS	Museum of London Archaeology Service
MoLSS	Museum of London Specialist Services
OD	Ordnance Datum (mean sea level at Newlyn, Cornwall)
OS	Ordnance Survey
RCHME	Royal Commission on Historical Monuments, England
TDP	Thames Discovery Programme
VCH	Victoria County History

Table 1: abbreviations used in this report

3 Topographical and historical background[2]

3.1 Introduction

The time-scales used in this report are as follows.

Palaeolithic	*c* 450,000 - 12,000BC
Mesolithic	*c* 12,000–4000 BC
Neolithic	*c* 4000–2000 BC
Bronze Age	*c* 2000–600 BC
Iron Age	*c* 600 BC–AD 43
Roman	AD 43–410
Early medieval	AD 410–*c* 1000
Later medieval	*c* AD 1000–1500
Post-medieval–modern (including industrial)	*c* 1500–present

3.2 Geology and natural topography

London occupies part of the Thames Basin, a broad syncline of chalk filled in the centre with Tertiary sands and clays. In the City, and in most of London, this Tertiary series of bed-rock consists of London Clay. Above the bed-rock lie the Pleistocene (Quaternary) fluvial deposits of the River Thames arranged in flights or gravel terraces. These terraces represent the remains of former floodplains of the river, the highest being the oldest with each terrace becoming progressively younger down the valley side.

During the post-glacial rise in sea level, Britain became separated from the European Continent. Subsequent climatic changes produced fluctuations in sea levels resulting in change to coastal and river patterns. In the Lower Thames Valley and Medway a series of silt and peat deposits in the estuaries have produced evidence for five marine transgressions over the past 8,500 years. Over that period the sea level has risen by 25m.

The result of this rise in sea level was that the Lower Thames Valley saw a build up of alluvial silts. The rise was not constant and during periods of regression the exposed areas of newly deposited silt was colonised by vegetation resulting in the deposition of peat. These processes of transgression and regression have resulted in layers of peat being sandwiched between layers of alluvial silts and sands[3].

The site is situated on the south bank of the river Thames below Vaizey's Wharf. The geology of the area has been observed to comprise natural sands. The foreshore at Vaizey's Wharf has been previously surveyed by the TDP (site code FGW14).

[2] This information is largely drawn from Wragg, 2009: 8-17, 98. Other sources will be referenced individually.
[3] Cohen 2008: 7-8

3.3 Archaeological and historical summary

3.3.1 Prehistoric

To the south of the site, in Charlton itself, evidence of Iron Age and earlier activity has been recorded although there is no evidence of activity in the area of the site itself.

3.3.2 Roman

There is no evidence of Roman activity in the vicinity of the site.

3.3.3 Medieval

There is no evidence of activity dating to this period in the area of the site.

3.3.4 Post medieval – modern

The area of the site itself appears to have been relatively undeveloped until recent times. In 1622 a waterman, John Taylor, told of his journey down river:

> ...past Greenwich marshes where a small colony of watermen and fishermen lived in isolation, past the pig farms of Charlton, the Isle of Dogs with its fishing village, past small gunpowder plants dotting the shoreline to Gravesend and beyond.

The Rocque map of 1746 showed a rural environment of fields with a lane running from the main east-west road towards, but not reaching, the riverbank; now known as Anchor and Hope Lane, with its distinctive kink, it was, at this time, depicted as Manor Lane.

By 1867, although the immediate area was still dominated by fields, the first stirrings of riverfront development were visible on the Ordnance Survey map of that date: A rope manufactory had been set up to the west of Anchor and Hope Lane, now extended to the river and known by its modern-day name. Immediately to the north of the rope works was a public house and associated structures, while three buildings and a pump had been erected east of the lane. At the end of Anchor and Hope Lane, Charlton Wharf had been built, jutting out onto the foreshore, on which stood a crane. A causeway was depicted to the west, and beyond it more structures were shown. To the east the "Charlton Ballast Wharf" had been erected, probably to deal with the sand then being exported from Charlton.

It seems likely that Charlton Wharf was occupied by the shipbreaking firm Castle and Beech by this time; documentary evidence suggesting that they opened a yard here around 1856. Known as "Riverside Wharf" or "Anchor and Hope Wharf", the site appears to have been Crown property and leased to the firm. In 1864 the Admiralty approved the styling of the works as an "Admiralty shipbreaking Yard". Castles' used the recovered timbers primarily for the construction of garden furniture, while the figureheads were used to decorate the walls of their yard at Baltic Wharf, Millbank.

A slipway comprising approximately 80 re-used warship timbers has been recently located some 50m east of the study site by the TDP and recorded as α327 (Fig. 4). The timbers appear to have come from at least three vessels of brig, sloop, corvette or frigate size; the slipway seems most likely to have been built between 1861 and 1885. It seems likely that this structure was associated with the shipbreaking which took place on the foreshore[4].

The Ordnance Survey map of 1894-6 showed further development, most noticeably that the former Charlton Wharf had been extended, Durham Coal Wharf and Charlton Parish Wharf had been built to the west, and still further west a barge building works had been constructed. Although still largely rural, the area behind the riverfront also showed signs of encroachment; to the east of Anchor and Hope Lane a timber yard had been erected, and to the west, south of the rope manufactory a number of other isolated structures had been built. The barge building yard was owned by William Cory and Sons, established in 1896, whose main trade was importing coal to London and exporting rubbish to be dumped on the Essex and Kent marshes.

Recent surveys and research by the TDP has suggested that a structure, recorded as α333, was built on the foreshore immediately to the north of the site during the period 1904/5 (Figs. 1-3). The structure appears to have been built from more than 100 timbers from the first rate warship HMS *Duke of Wellington* launched in 1852 and at least one of the second rates HMS *Anson*, *Edgar* or *Hannibal* launched in1854, 1858 and 1860 respectively, along with fragments of armour plate from the iron proto-battleship HMS *Ajax* launched in 1880. This structure, again, seems likely to be associated with the shipbreaking activity[5].

The revetment on the eastern face of Vaizey's Wharf also appears to comprise some re-used warship timbers, in this case, side planking (Fig. 5). It has been recorded by the TDP as α340 but has not yet been investigated in any detail[6].

A recent engineering trial hole dug behind the current river wall revealed a possible wooden capstan[7] which may also be related to the ship-breaking yard.

A map of 1912 listed the principal wharves and businesses operating on the riverfront. In the area of the site, from west to east, it showed the presence of Cunis Wharf, Cory's Barge Building Works, Charlton Wharf (Flower and Everett), Durham Wharf (Woods Lighterage Co.), the Anchor and Hope boathouse, Anchor and Hope Wharf (Castles' Shpbreaking Co.) and the Silicate Paint Works Wharf.

The 1916 Ordnance Survey Map showed the new structure built in 1904/5 on the foreshore. A glass bottle works had been erected to the west of Anchor and Hope Lane with allotments and a paint works further south, while, to the east two groups of housing had been constructed around Derrick Gardens and Atlas Gardens, with allotments further east.

[4] Wragg 2011: 84
[5] Ibid.: 79
[6] Ibid.: 73
[7] A. Brossler pers. comm.

By 1937 the Ordnance Survey Map demonstrated that much more of the open land had been built upon. The glass bottle manufactory had been extended southwards, while to the south further industrial buildings and a greyhound racing track had been built. East of Anchor and Hope Lane an engineering works had been built and the rope manufactory appears to have been relocated here.

Charlton Buoys in the river, just north of the site, were mainly used for the mooring and unloading of sugar ships.

4 The foreshore survey

4.1 Methodology

All archaeological analysis and recording during the investigation on site was done in accordance with the Museum of London *Archaeological Site Manual* (1994) and MoLAS *Health and safety policy* (2009).

The site was surveyed during three low tide windows (11th to the 13th of January 2011) with a predicted low water level of 0.90 -1.30m. Access to the foreshore was provided via stairs below the Anchor and Hope public house. A photographic survey was also undertaken.

The site record comprises TDP alpha survey sheets, context sheets, plans and elevations, digital survey data and 27 digital photographs. No objects or samples were collected. The site records will be deposited and indexed in due course in the Museum of London archaeological archive, along with the ongoing TDP archive under the site code FGW14. The project was designed to produce an archive that could be integrated with the Thames Archaeological Survey (TAS) records.

4.2 The archaeology of the foreshore (Fig. 2)

An archaeological survey was conducted on the revetments in front of Vaizey's Wharf. A number of discreet features were recorded.

4.2.1 α 337 (Figs. 6 & 7)

The earliest feature recorded on the site, α337, comprised a series of timbers occupying an area some 7.80m E-W, more than 1.10m N-S and up to 0.78m high. Probably of oak, the feature was made up of two planks (one of which had collapsed), three tie-backs and twenty five posts. With an alignment of approximately southwest-northeast, and apparently held together by iron bolts, this feature was extremely degraded and had been impacted on by later revetments α339 to the south and α338 to the west. It is possible that more of this structure may survive beneath these later revetments.

The planks, up to 2.60m long, 0.05m wide, and more than 0.30m in height were in a very poor condition. The posts, predominantly of square or rectangular section, varied in size between 0.10 x 0.10m and 0.22 x 0.22m square with a maximum height of 0.78m. They were extremely degraded. The tie-backs, broadly aligned northeast-southwest, and extending beneath the later riverfront α339, varied in width between 0.16 and 0.28m wide, and in length between 0.59 and 0.72m, while they were over 0.10m in height and were also very degraded.

One of the tie-backs, less obviously degraded than the other timbers, showed a number of fixtures and fittings and was, therefore, recorded individually

and ascribed the context number [190] (Figs. 8 & 9). While only part of the timber was visible, it had a length of more than 0.59m, a width of 0.30m and a height of over 0.10m, and, in its upper face, had two 0.03m and one 0.05m diameter treenails *in situ,* along with a degraded hole for a further treenail of approximately 0.03m diameter. At its northern end it had a mortise joint filled by tenon [191] measuring 0.08 x 0.03x 0.10m (length, width, height).

This feature has been recorded as a river front revetment.

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4.2.2 α341 (Fig. 10)

Probably the next feature to be built on the site was a possibly square structure, built by pouring concrete into a timber cofferdam, some of which survived. Broadly in alignment with revetment α337, it was visible for 0.84m north-south, 1.80m east- west and was 1.46m high with a large iron bracket protruding a further 0.25m from the top of the concrete. Further heavily corroded, iron elements may relate either to its original purpose or to later developments.

This feature has been recorded as a probable crane base possibly associated with revetment α337.

4.2.3 α336 (Figs. 11-14)

Revetment α337 appears to have been replaced by a later structure on a slightly different alignment α336. Probably largely of pine, with only one possible oak upright, it ran on a broadly west-southwest- east-northeast alignment, before turning at the western end to run approximately north-northwest- south-southeast. It was 19m long, up to 1.75m high and 0.40m wide, while the dog leg to the south was 3m long. The planks were up to 5.42m long, 0.08m wide and 0.52m high. The posts were square or rectangular with dimensions up to 1.75m high, 0.28m N-S and 0.38m E-W. The feature appears to have been constructed from re-used ships' timbers and is held together by iron bolts or nails.

Four timbers, being diagnostic, were recorded in more detail.

Timber [192] measured 0.33m E-W, maximum 0.17m N-S and was 0.77m high. It was scarfed to timber [193] which measured 0.33m E-W, maximum 0.22m N-S and was 0.82m high (Figs. 15 & 16). Both timbers were probably of pine, were fairly degraded and together comprised one of the upright posts for α336. They were held together by at least two iron bolts and probably represent broken up and re-used ships' timbers, most likely deck beams.

Timber [194] was1.20m high and measured a maximum 0.30m N-S by 0.38m EW. It was scarfed to timber [195] which measured 0.11m N-S, 0.38m E-W and was 0.49m high (Figs. 17 & 18). Again, both timbers were probably of pine, were fairly degraded and comprised a post for revetment α336. They were also held together by at least two iron bolts and again are probably re-used ships' deck beams.

4.2.4 α339 (Fig. 19)

This feature, approximately 19m long and made of corroded corrugated iron, comprises the current river front.

4.2.5 α338 (Fig. 20)

This feature, constructed of sheet piling, is approximately 13m long and represents an attempt to repair or protect the western end of riverfront α339.

4.2.5 α314 (Fig. 21)

This feature was built from timber piles and planking. Running approximately north-south for more than 4m, it represents a further attempt to repair or protect α339; this time on its western face.

5 Archaeological potential

5.1 Original research aims

A number of research aims were identified in the Written Scheme of Investigation[8]:

- Can we determine the extent of the structures?

The earliest structure recorded, α337, was 7.80m long, more than 1.10m wide and up to 0.78m high. Its replacement, α336, was 19m long, 0.40m wide and up to 1.75m high; with a north-south running dogleg which was 3m long.

- Can we determine the nature of the structures?

Both timber structures comprise re-used ship's timbers and form earlier river defences.

- Can we establish the date of these structures?

Given that the later revetment α336 is butted up against by the ships' timber structure built in 1904/5, both of the revetments are likely to predate it. Although in the case of α336, this revetment could possibly have been built of timbers from the same ships whose timbers comprised the structure.

The Castle's ship-breaking firm appears to have been established on the site from 1856, and, although it is possible that ships may have been broken up there before their establishment on site, in the absence of any evidence for this and given the condition of the timbers it seems likely that the structures postdate 1856.

5.2 New research aims

- Are any of the re-used ships' timbers diagnostic? If so, what parts of the vessels are they from?

  Tie-back [190], part of revetment α337, while probably a re-used ship's timber was quite degraded and its original use could not be ascertained.

  Timbers [192], [193], [194] and [195], part of revetment α336, however, were probably deck beams, straight and with characteristic scarf joints[9], but they appear to be of pine. In the 18th century it seems that oak was used for deck beams, although these timbers were extremely expensive due to the difficulty of finding oaks with a straight enough grain[10] and

[8] Hoad & Wragg 2011: 9.
[9] Lavery 1985: 43
[10] Ibid: 13-14

by the mid 19th century more exotic species such as teak or 'African Oak', actually *Oldfieldia Africana*, were being used in some vessels for these members[11]. Pine, however, was used for deck beams in American warships[12] and may have been experimented with in British vessels. Moreover, one of the timbers suggested as coming from HMS *Duke of Wellington* appears to have been a pine repair to the keelson. After active service and during her long subsequent career as an accommodation hulk, it may be possible that repairs were done more cheaply than would have been acceptable for a seagoing vessel and pine substituted for oak or teak.

The planks in revetment α336 may possibly represent deck planking, as pine was more often used for deck planking than elsewhere on vessels, extant examples of vessels with pine deck planking being the *Jhelum* and the *Cutty Sark*[13]. Moreover, by the mid 19th century the timber used for deck planking appears not to have been specified by the Admiralty[14] and may, therefore, have been down to the individual shipyard's discretion.

- From what type of vessel are the diagnostic timbers likely to come?

The probable deck beams from α336 have maximum cross sections of 0.33 x 0.30m ([192]/[193]) and 0.38 x 0.30m ([194]/[195]). By comparison the upper deck beams of the *Bellona*, a typical mid 18th century 3rd rate 74 gun ship of the line, had a cross section of 0.36 x 0.30m[15], while the upper deck beams of the *Hannibal*, a 91 gun, 2nd rate launched in 1854 had cross sections of 0.38 x 0.35m, although African timber was specified[16]. It appears that these deck beams, therefore, are likely to come from a vessel of similar size to an 18th century 3rd rate or slightly smaller.

The possible deck planking, with a thickness of 0.08m, also seems likely to come from a vessel smaller than a mid 19th century 2nd rate; *Hannibal's* deck planking being specified at between 0.10 and 0.11m[17].

Further research into Admiralty shipbuilding specifications held at the National Maritime Museum may address this question more closely.

- Can the parent vessel(s) be identified?

A list of warships broken up by the Castle's firm has been compiled and posted online[18], while another website gives a great deal of information about the careers of 19th century warships and, in some cases, specifies the location of a ship's breaking up, thus further narrowing the list[19].

[11] Wragg 2009: 87-88, Lambert 1996: 47, Symonds, 1847
[12] Cheaspeake Mill webpage
[13] Bound 1990: 43, Original Specification for Cutty Sark webpage
[14] Symonds, 1847
[15] Lavery 1985: 42
[16] Symonds, 1847, Davies webpage A
[17] Ibid
[18] Castle's webpage
[19] Davies webpage

Assuming that the timbers from α336 have come from a 3rd, 4th or 5th rate vessel, then there are a number of possible candidate vessels:

Leonidas	5th rate, launched 1807, broken up 1894
Chichester	4th rate, launched 1843, broken up 1889
Aeolus	5th rate, launched 1825, broken up 1886
Dublin	3rd rate, launched 1812, broken up 1885
Worcester	4th rate, launched 1843, broken up 1885
Laurel	5th rate, launched 1813, broken up 1885
Gloucester	3rd rate, launched 1812, broken up 1884
Agincourt	3rd rate, launched 1817, broken up 1884
Rhin	5th rate, launched 1806, broken up 1884
Undaunted	4th rate, launched 1861, broken up 1882
Phoebe	4th rate, launched 1854, broken up 1875
Constance	4th rate, launched 1846, broken up 1875
Melpomene	4th rate, launched 1857, broken up 1875
Diadem	5th rate, launched 1856, broken up 1875
Liverpool	5th rate, launched 1860, broken up 1875
Mersey	5th rate, launched 1858, broken up 1875
Emerald	4th rate, launched 1856, broken up 1869
Cressy	3rd rate, launched 1853, broken up 1867
Collingwood	3rd rate, launched 1841, broken up 1867
Colossus	3rd rate, launched 1848, broken up 1867
Euryalus	4th rate, launched 1853, broken up 1867
Chesapeake	4th rate, launched 1855, broken up 1867
Leander	4th rate, launched 1848, broken up 1867
Termagent	5th rate, launched 1847, broken up 1867
Arrogant	5th rate, launched 1848, broken up 1867
Edinburgh	3rd rate, launched 1811, broken up 1866
Vulture	frigate 2nd class, launched 1843, broken up 1866
Inconstant	5th rate. launched 1836, broken up 1866
Achilles	3rd rate, launched 1798, broken up 1865
Odin	frigate 1st class, launched 1846, broken up 1865
Eurotas	5th rate, launched 1829, broken up 1865
Horatio	5th rate, launched 1807, broken up 1865
Sidon	frigate 1st class, launched 1846, broken up 1864
Retribution	frigate 1st class, launched 1844, broken up 1864
Sampson	frigate 2nd class, launched 1844, broken up 1864
Firebrand	frigate 2nd class, launched 1842, broken up 1864
Dragon	frigate 2nd class, launched 1845, broken up 1864
Penelope	5th rate, launched 1829, broken up 1864
Venus	5th rate, launched 1820, broken up 1864
Portland	4th rate, launched 1822, broken up 1862

Again, research into Admiralty plans and specifications held at the National Maritime Museum may inform us further as to the potential parent vessel(s).

5.3 Significance of the data

Alone, the features identified are of some significance for the history of the immediate locality. In conjunction with the other nautical remains found

elsewhere on the foreshore at Vaizey's Wharf, however, they are of international importance in the field of vessel archaeology:

As discussed above (3.3.4), the timber structures with which this report is concerned make up but a small part of a much larger site comprising elements from at least six or seven 19th century (or possibly late 18th century in one or two cases) warships. These vessels range in size from brig, sloop or corvette to the *Duke of Wellington*, on her launch in 1852 the most powerful warship in the world. To the author's knowledge, no site in the world has so far been recorded with elements of remotely the same range of 19th century warship types. The period 1805-1860 was one of rapid change in wooden warship design, primarily through the use of different framing techniques and different bow and stern designs, before steam propulsion started to be applied to warships from 1822 onwards, thus causing further structural change. And yet simultaneously, as these radical design changes were taking place, the quantity of Admiralty plans, specifications and models preserved for study declines dramatically[20]. So much so that:

> Surprisingly perhaps, aspects of maritime related woodwork, shipwrightry and foreshore carpentry from the industrial age up to the mid 19th century are still little known in detail[21].

Not only does the wider site have a plethora of diagnostic timbers from the various final evolutions of the sailing warship, it also has elements from one of the experimental warships constructed from 1860 until warship design finally caught up with technology in the late 1880s, and is, therefore, unique in having features which bridge a transition in naval architecture even greater than that from 1805-1860. As I have written elsewhere in relation to structure α333 alone:

> The discoveries on the foreshore at Charlton give us a rare opportunity to investigate one of the most revolutionary and dynamic periods in naval architecture when steam was replacing sail, and iron, subsequently steel, was replacing wood. The *Duke of Wellington* was designed as a larger and more powerful version of HMS *Victory* but was modified to take a steam engine while under construction; while documentary evidence suggests that the 2nd rate vessel[s] seems to have been designed from the outset for steam engines. Further analysis of the timbers at Charlton should give us a new insight into the construction of these final examples of the 'wooden walls'. The last of the candidate 2nd rates to be built, HMS *Anson*, was launched in the same year as the famous HMS *Warrior*, the first iron capital ship, which instantly revolutionised naval warfare.
>
> HMS *Ajax*, launched only 20 years after the *Anson*, represents a completely different vessel; solely steam powered, with a small number of huge guns and a few smaller breach loaders and machine guns, rather than the bristling rows of smaller muzzle loading cannon of the wooden vessels, and built of iron, with a massively thick armoured belt. While she provides pointers to the future development of naval architecture, with her anti-torpedo boat

[20] Wragg 2009: 79, 84-5, 91-3, Wragg 2011: 78-84
[21] Heard with Goodburn, 2003: 34

> armament and lack of sailing rig, she too would be almost immediately rendered obsolescent. She and her sister *Agamemnon* were the last British capital ships to be constructed of iron rather than steel, were the last to mount muzzle loading guns as their main armament, and were the last to have wrought iron armoured belts rather than using the improved compound armour then being introduced.
>
> Apart from HMS *Warrior* and the Danish sail and steam frigate the *Jylland*, both largely modern reconstructions, no other examples of parts of large, first class, warships of this period are so easily accessible (ie. not underwater) in Europe. In the United States a number of civil war ironclads have been recovered from the seabed, but these are small, unseaworthy, mainly coastal craft which represent a backwater and virtual dead-end in warship development, not frontline cutting edge ships of war as are those represented at Charlton.
>
> For more than 200 years warship design had remained relatively stable and yet, in little under forty, the ships that Nelson knew and that Drake or even Columbus would have understood, had been replaced by infinitely more powerful vessels; direct precursors of the mighty battleships of the 20th century. At Charlton we have the only known easily accessible archaeological evidence in Europe of this most remarkable and fast-moving period in the development of warship construction[22].

The further research undertaken at the Vaizey's Wharf foreshore since the above was written has only served to enhance the significance of the site.

The results of this survey will, therefore, be eventually published along with the results of the other work carried out by the TDP on this foreshore in the *International Journal of Nautical Archaeology*. The results of this survey alone will also be published in summary form in the annual excavation round-up in the *London Archaeologist*.

5.4 Salvaged fixtures, fittings and materials

As this was a non- intrusive survey, there was no archaeological requirement to salvage any of the materials or fittings.

5.5 General discussion of archaeological potential

Two wooden riverfront revetments were recorded which were constructed from re-used ships' timbers, one of which was associated with a concrete crane base. They probably dated to the period c.1856-1904/5. The latest appears to have fallen out of use during the 20th century and been replaced by a corrugated iron river wall, which has seen at least two phases of repair.

Four of the timbers in the later revetment appear to have been pine deck beams from a line-of-battle-ship or large frigate, while the planking of the same revetment may possibly be deck planking. Further comparison of these timbers with the others found on the foreshore at Vaizey's Wharf and with

[22] Wragg 2009: 91-2

similar examples from further afield, along with documentary research should give us more information about the construction and maintenance of 18th and 19th century warships.

6 Publication and archiving

Information on the results of the survey will be made publicly available to permit inclusion of the site data in any future academic researches into the development of London or warship development.

The site archive containing original records will be stored with the Museum of London.

In view of the significance of the data (Section 5.3) it is suggested that:

A summary of the results of this survey should appear in the annual round up of the *London Archaeologist.* While a discussion of the diagnostic re-used ships timbers should be included in the proposed full foreshore article to be written for the *International Journal of Nautical Archaeology.*

7 Acknowledgements

Museum of London Archaeology and the Thames Discovery Programme would like to thank Adam Brossler of Jacobs Engineering UK Ltd for commissioning the work, on behalf of their client the Environment Agency.

The author would like to thank Mark Burch for the illustrations, Latifa Nouibat for her on-site fieldwork, and Gustav Milne and Dr Joe Flatman of UCL for their advice.

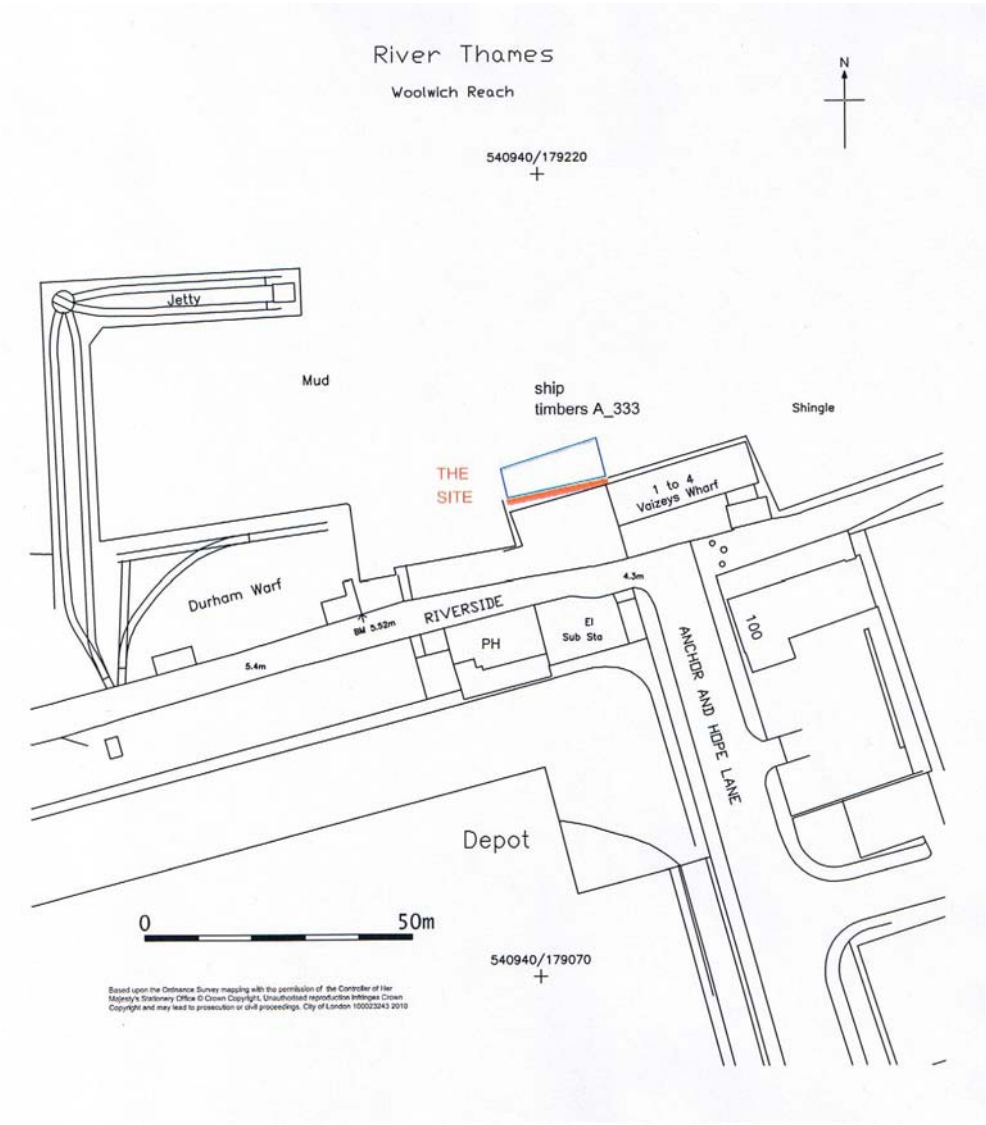

Fig 1: Site location

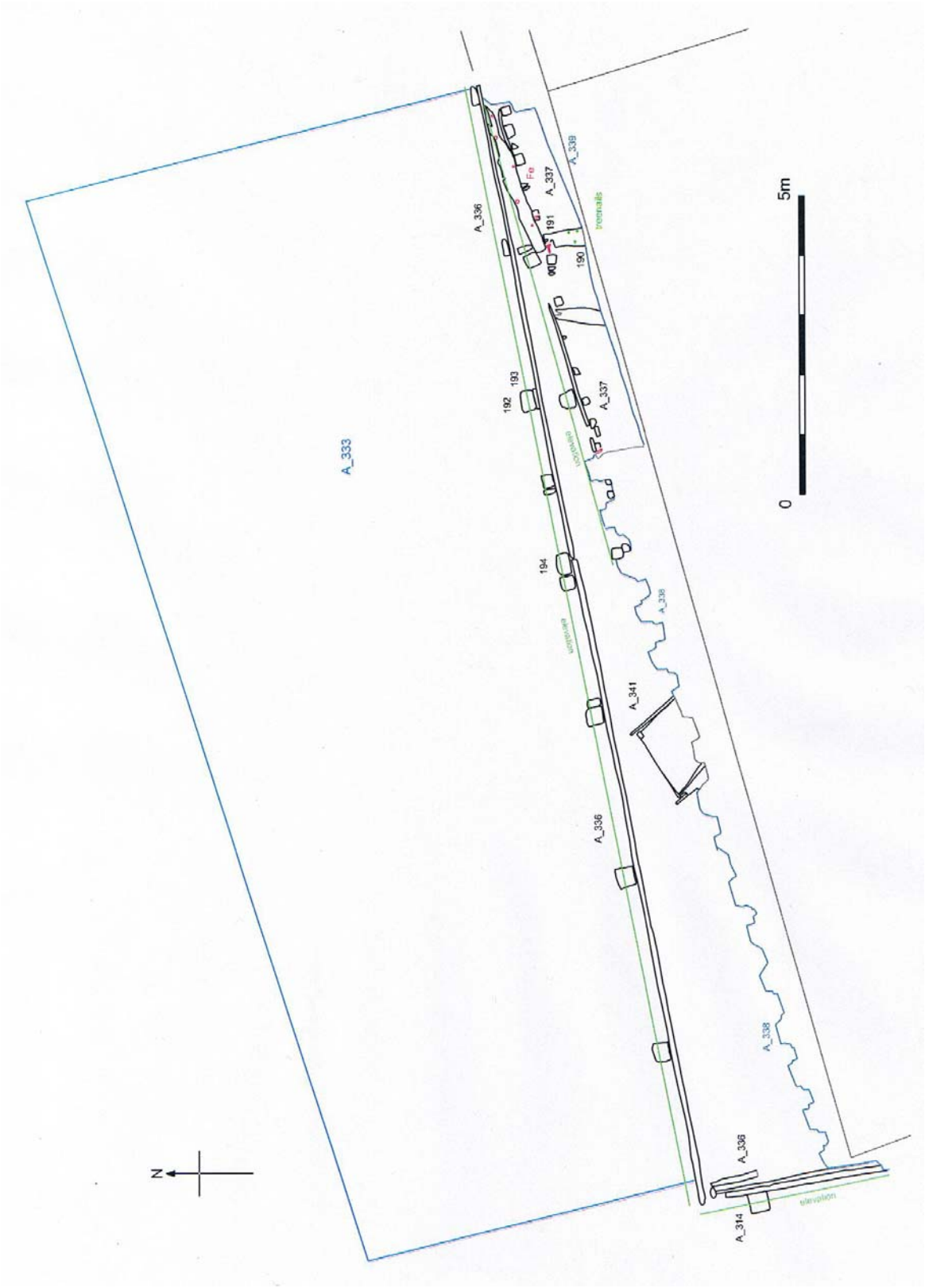

Fig 2: Plan of revetments and crane base.

Fig 3: α333 looking west. Part of study site on left. ©TDP

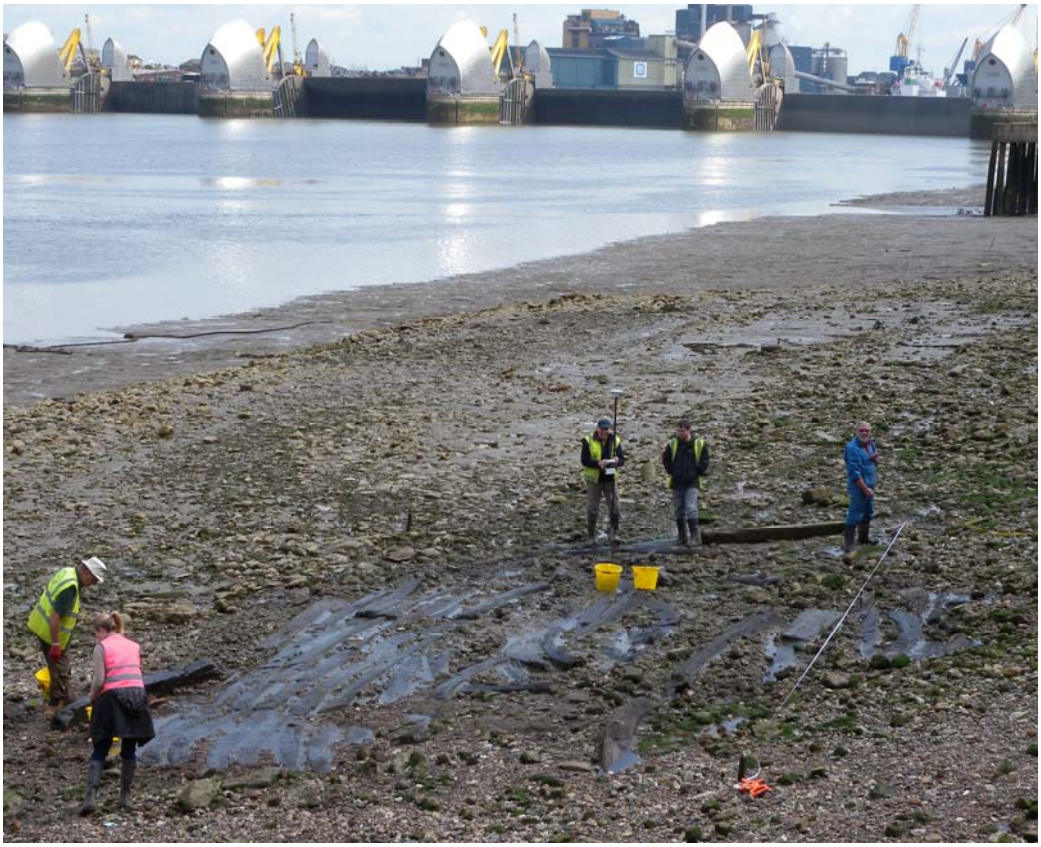

Fig 4: TDP volunteers working on α327. Looking east. ©TDP

Fig 5: α340 looking west. ©TDP

Fig 6: N facing elevation α337.

Fig 7: Revetment α337. Looking west. © MoLA/TDP

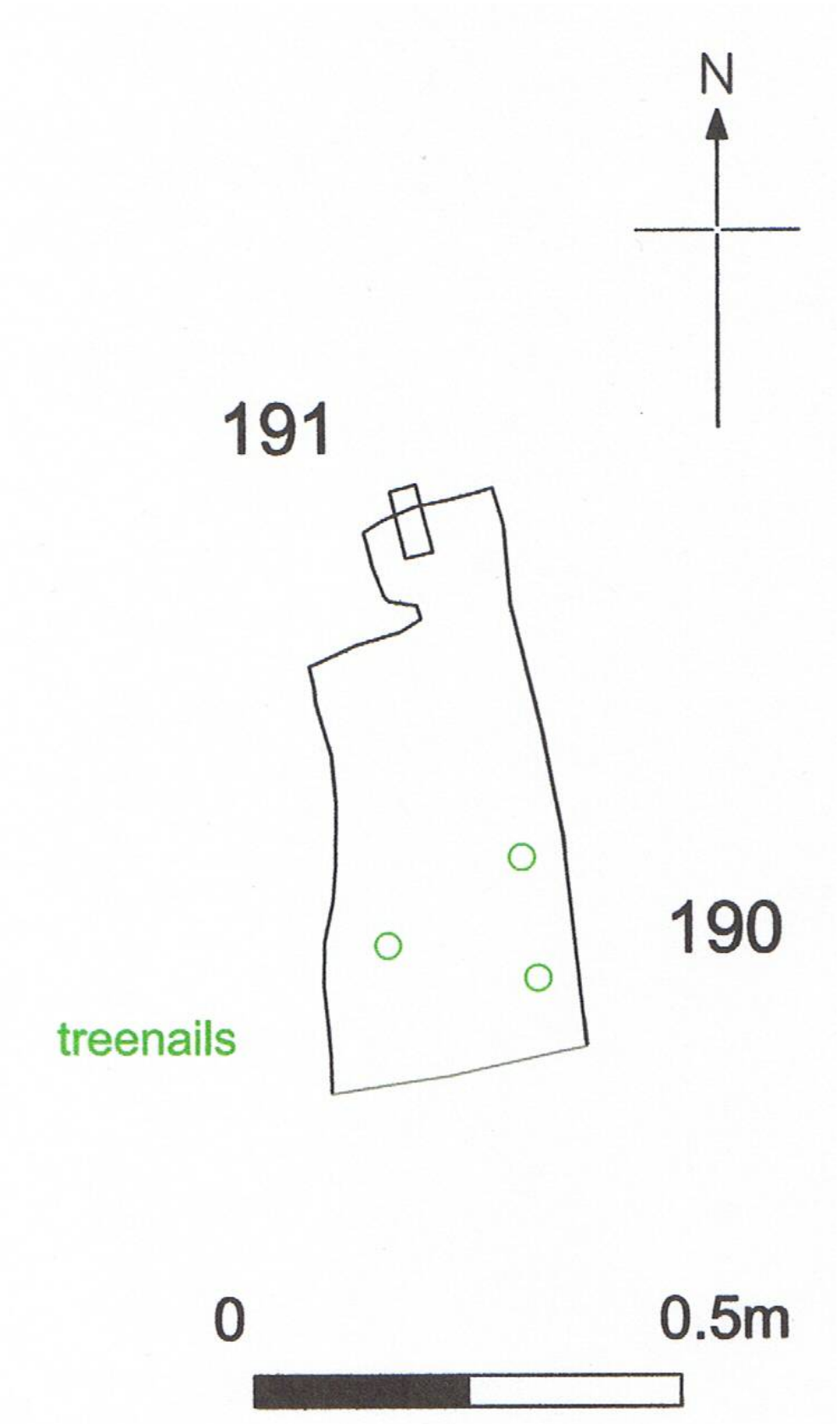

Fig 8: Detailed plan of timbers [190] and [191].

Fig 9: Detail of timbers [190] and [191]. © MoLA/TDP

Fig 10: Crane base α341 Looking south © MoLA/TDP

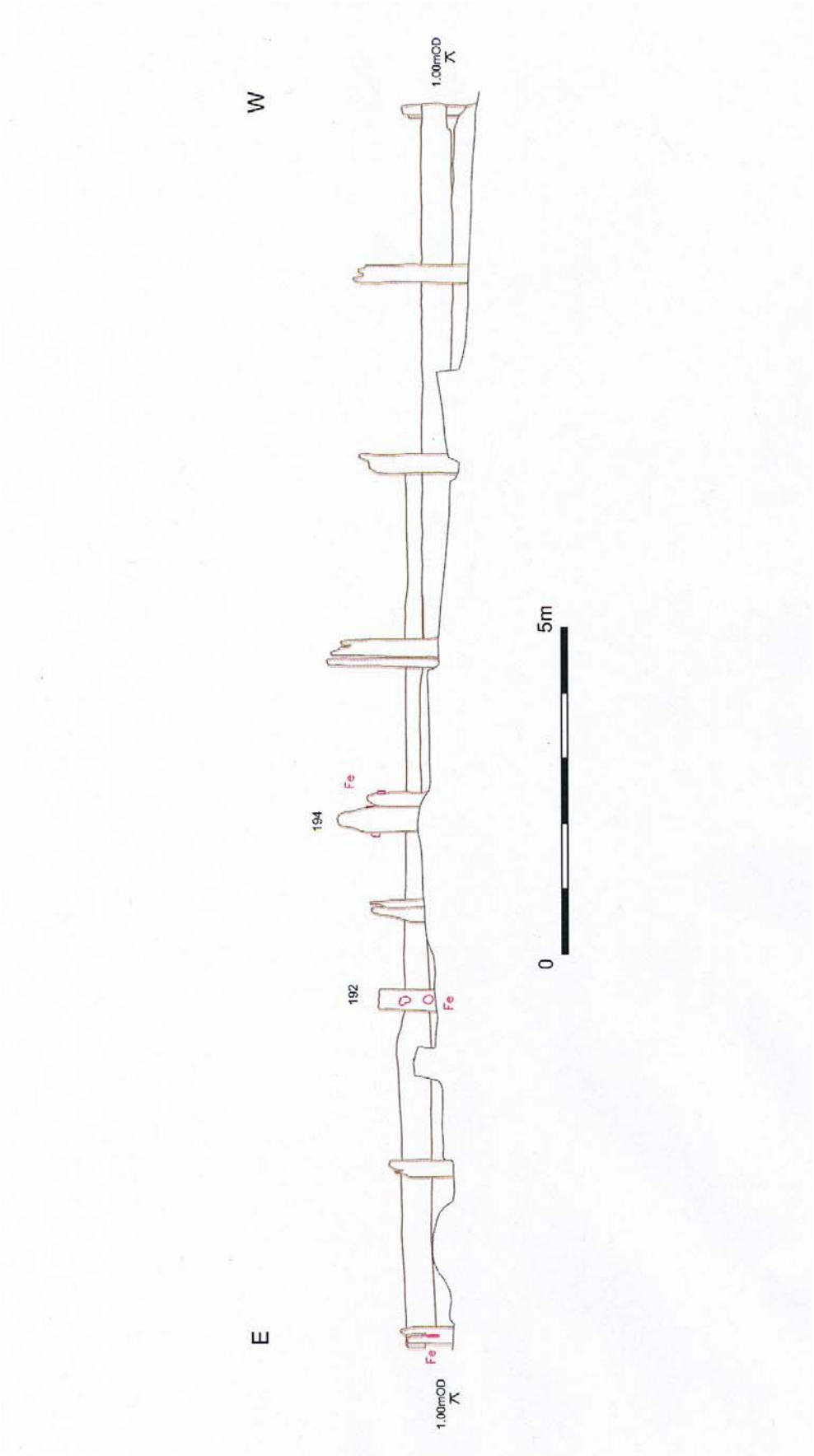

Fig 11: N facing elevation α336.

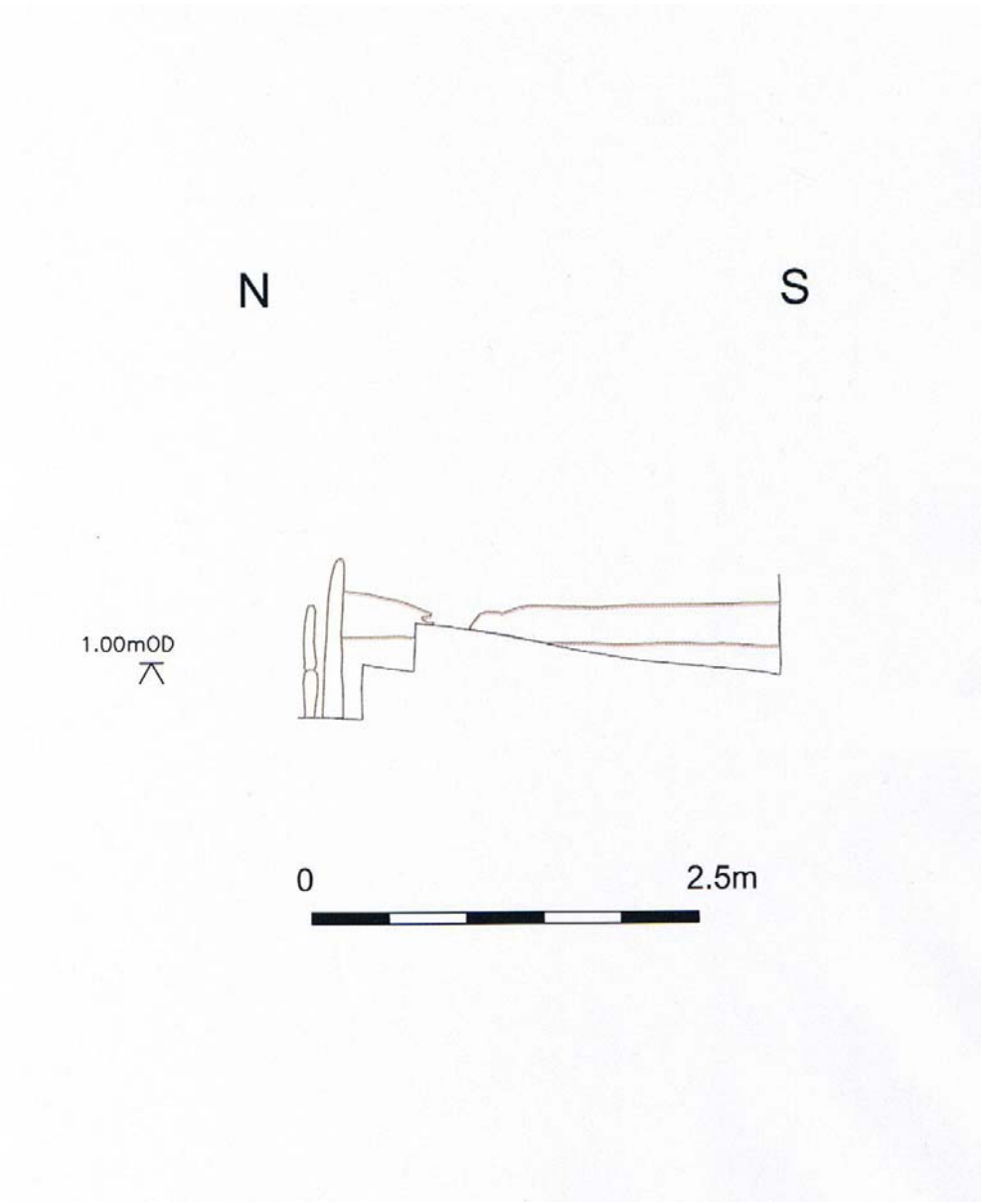

Fig 12: W facing elevation α336.

Fig 13: Revetment α336. Looking southeast. © MoLA/TDP

Fig 14: Revetment α336. Looking southwest. © MoLA/TDP

Fig 15: Detail of timbers [192] and [193]

Fig 16: Detail of timbers [192] and [193] Looking east
© MoLA/TDP

Fig 17: Detail of timbers [194] and and [195] Looking west
© MoLA/TDP

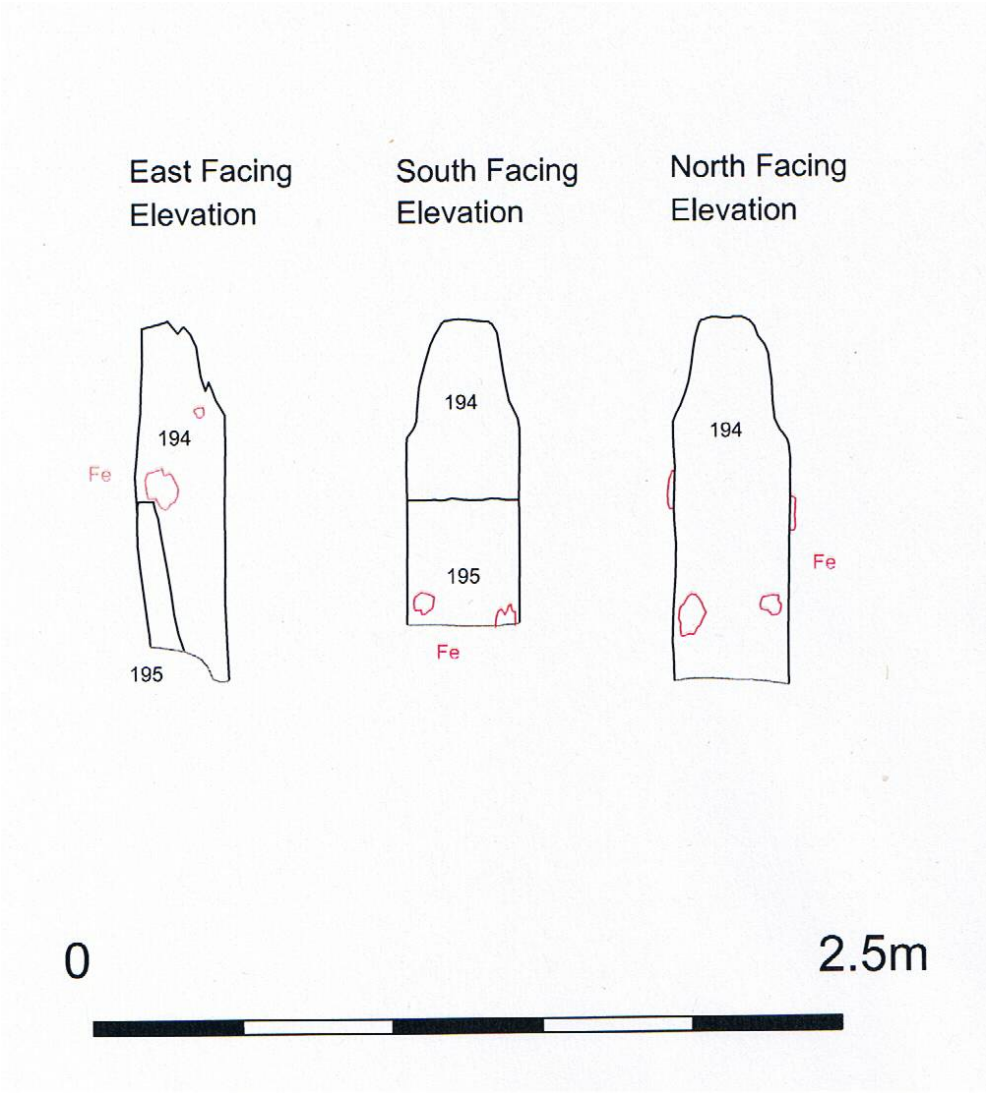

Fig 18: Detail of timbers [194] and [195]

Fig 19: Revetment α339 Looking southeast © MoLA/TDP

Fig 20: Revetment α338 Looking southeast © MoLA/TDP

Fig 21: Revetment α314 Looking east © MoLA/TDP

8 Bibliography

ACAO, 1993 Association of County Archaeological Officers, *Model briefs and specifications for archaeological assessments and field evaluations*

BADLG, 1986 British Archaeologists and Developers Liaison Group, *Code of practice*

Bound, M. 1990 *The hulk* Jhelum*: a derivative expression of late British indiaman ship-building.* International Journal of Nautical Archaeology vol 19 (1)

Castle's webpage:
http://www.castlesshipbreaking.co.uk/ships_broken_up.htm

Chesapeake Mill webpage: http://www.chesapeakemill.co.uk/history.html

Cohen, N. 2008 *Greenwich Wharf Phase 1. An Archaeological Assessment and Foreshore Survey Report.* MoLAS unpublished report.

Davies, P. webpage A: http://www.pdavis.nl/ShowShip.php?id=23

Davies, P. webpages: http://www.pdavis.nl/MidVicShips.php?page=1

Department for Communities and Local Government, 2010 *Planning Policy Statement 5: Planning for the Historic Environment.*

English Heritage, 1991 *Management of Archaeological Projects* (2nd edition)

English Heritage, 1991 *Exploring our past: strategies for the archaeology of England*

English Heritage, 1997 *Sustaining the historic environment: new perspectives on the future*

English Heritage, 1998 *Capital archaeology: strategies for sustaining the historic legacy of a world city*

English Heritage, 2000, *Power of place, the future of the historic environment*

English Heritage Greater London Archaeology Advisory Service, 1998 *Archaeological guidance papers 1–5*

English Heritage Greater London Archaeology Advisory Service, 1999 *Archaeological guidance papers 6*

Heard, K. with Goodburn, D., 2003, *Investigating the maritime history of Rotherhithe*. MoLAS Archaeological Studies Series, Vol. 11. London: MoLAS.

Hoad, S. and Wragg, E., 2011. *Vaizey's Wharf. A Written Scheme of Investigation for an Archaeological Foreshore Survey.* MoL Archaeology/TDP unpublished document.

IFA, 2001 Institute of Field Archaeologists, *By-laws, standards and policy statements of the Institute of Field Archaeologists, standard and guidance: desk-based assessment*, rev, Reading

Lambert, A.D., 1996, *Preparing for the long peace: The reconstruction of the Royal Navy 1815-1830.* Mariners Mirror Vol 82 (1).

Lavery B., 1985, *The 74 gun ship* Bellona. London: Conway Maritime Press.

Lyon, D. and Winfield, R., 2004, *The sail and steam navy list. All the ships of the Royal Navy 1815-1889.* London: Chatham.

Museum of London Archaeology Service, 2000 *The archaeology of Greater London: an assessment of archaeological evidence for human presence in the area covered by modern Greater London*, London

Museum of London Archaeology Service, 2008 *Health and safety policy*

Museum of London, 1994 *Archaeological site manual* (3rd edition)

Museum of London, 2002 *A research framework for London archaeology 2002*

Original Specification for Cutty Sark webpage: http://www.cuttysark.org.uk/resources/14/assets/images/Original%20Specifications/The%20Original%20Specification%20for%20Cutty%20Sark.pdf

Symonds, T. 1847, *A scheme of scantlings for building in the dock yard at Deptford, one 90 gun ship to be named the Hannibal.* Unpublished Admiralty document, National Maritime Museum.

Wragg, E. 2009, *An Interim Assessment of the Warships' Timbers Forming a Structure on the Foreshore at the Former Anchor and Hope Wharf, Charlton, London Borough of Greenwich.* Unpublished MA dissertation, Institute of Archaeology, University College London.

Wragg, E. 2011, *Anchor and Hope, Charlton, London Borough of Greenwich. An interim archaeological foreshore report.* Unpublished report in preparation, Thames Discovery Programme.

9 NMR OASIS archaeological report form

9.1 OASIS ID: thamesdi1-92322

Project details	
Project name	Vaizey's Wharf Anchor and Hope Lane Charlton London SE7 . An archaeological assessment report
Short description of the project	Museum of London Archaeology (MOLA) and The Thames Discovery Programme (TDP) were commissioned by Adam Brossler of Jacobs Engineering UK Ltd., on behalf of their client the Environment Agency to record the foreshore at Vaizey's Wharf, Anchor and Hope Lane, Charlton, London Borough of Greenwich, SE7. The investigation took place in January 2011. Two wooden riverfront revetments were recorded which were constructed from re-used ships' timbers, one of which was associated with a concrete crane base. They probably dated to the period c.1856-1904/5. The latest appears to have fallen out of use during the 20th century and been replaced by a corrugated iron river wall, which has seen at least two phases of repair. Four of the timbers in the later revetment appear to have been pine deck beams from one or two of either an 18th or 19th century 3rd rate line-of-battle-ship or a large frigate, while the planking of the same revetment may possibly be deck planking from the same vessel(s).
Project dates	Start: 11-01-2011 End: 13-01-2011
Previous/future work	Yes / Yes
Any associated project reference codes	FGW14 - Sitecode
Type of project	Field evaluation

Site status	Local Authority Designated Archaeological Area
Current Land use	Coastland 2 - Inter-tidal
Monument type	CRANE Post Medieval
Monument type	RIVER DEFENCES Post Medieval
Significant Finds	N/A None
Methods & techniques	'Measured Survey','Photographic Survey','Visual Inspection'
Development type	Building refurbishment/repairs/restoration
Prompt	Planning condition
Position in the planning process	Not known / Not recorded

Project location

Country	England
Site location	GREATER LONDON GREENWICH GREENWICH Vaizey's Wharf
Postcode	SE7
Study area	40.00 Square metres
Site coordinates	TQ 540945 179165 50.9394979466 0.193500607688 50 56 22 N 000 11 36 E Point

Project creators

Name of Organisation	Thames Discovery Programme/Museum of London Archaeology
Project brief originator	Consultant
Project design originator	Eliott Wragg and Stewart Hoad

Project director/manager	Eliott Wragg and Stewart Hoad
Project supervisor	Eliott Wragg
Type of sponsor/funding body	Developer
Name of sponsor/funding body	The Environment Agency

Project archives

Physical Archive Exists?	No
Digital Archive recipient	Museum of London
Digital Archive ID	FGW 14
Digital Contents	'Survey'
Digital Media available	'Images raster / digital photography','Survey','Text'
Paper Archive recipient	Museum of London
Paper Archive ID	FGW 14
Paper Contents	'Survey'
Paper Media available	'Context sheet','Drawing','Unpublished Text','Plan','Survey '

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Vaizey's Wharf Anchor and Hope Lane

	Charlton London SE7 . An archaeological assessment report.
Author(s)/Editor(s)	Wragg, E.
Date	2011
Issuer or publisher	MoLA/TDP
Place of issue or publication	London
Description	A4 pamphlet
Entered by	Eliott Wragg (e.wragg@thamesdiscovery.org)
Entered on	1 February 2011

10 Appendix 1: list of archaeological photographs

Image number	Direction of view	Description
1186	E	Revetment α336
1187	E	Revetments α336 & α314
1188	SE	Revetments α336 & α338
1189	SE	Crane base α341
1190	SW	Revetments α336, α337 & α339
1191	E	Revetments α336, α337 & α339
1192	SW	Revetments α336, α337 & α339
1193	SW	Revetments α336, α337 & α339
1194	S	Revetments α336, α337 & α339
1195	S	Revetments α336, α337 & α339
1196	S	Revetments α336, α337 & α339
1197	S	Revetments α336, α337 & α338
1198	S	Revetments α336, α337, α338 & crane base α341
1199	S	Revetments α336, α338 & crane base α341
1200	S	Revetments α336 & α338
1201	S	Revetments α336 & α338
1202	N	Revetments α336 & α337
1203	N	Revetments α336 & α337
1204	N	Revetments α336 & α337
1205	W	Revetments α336 & α337
1206	W	Revetments α336 & α337
1235	E	Timbers [190] & [191]
1236	W	Timbers [190] & [191]
1237	N	Crane base α341
1242	W	Timbers [194] & [195]
1243	E	Timbers [192] & [193]
1247	SE	The site

11 Appendix 2: updated alpha survey record

α Number	Type	Description
α336	River defence	19th/20th century timber revetment
α337	River defence	19th century timber revetment
α338	River defence	20th century sheet piling
α339	River defence	20th century iron revetment
α341	Crane base	19th century concrete crane base