GREENWICH REACH &

43-81 GREENWICH HIGH ROAD

LONDON BOROUGH OF GREENWICH

ASSESSMENT OF TWO

ARCHAEOLOGICAL EXCAVATIONS

GQR 06 & GHI 08

FEBRUARY 2010

PRE-CONSTRUCT ARCHAEOLOGY

DOCUMENT VERIFICATION

GREENWICH REACH & 43-81 GREENWICH HIGH ROAD
LONDON BOROUGH OF GREENWICH

EXCAVATIONS

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An Assessment of an Archaeological Excavation of Land at Greenwich Reach, Thames Street & 43-81 Greenwich High Road, London Borough of Greenwich

Site Code: GQR 06

Central National Grid Reference: TQ 3788 7777

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CONTENTS

APPENDICES

ILLUSTRATIONS

1 ABSTRACT

1.1 This report details the working methods and results of archaeological excavations at Land at Greenwich Reach, Thames Street, London Borough of Greenwich (GQR 06) and 43-81 Greenwich High Road (GHI 08). The excavation at Greenwich Reach was conducted between January and March 2009 in advance of the proposed redevelopment of the site. The archaeological works consisted of a single large open area excavation, centred on one of the evaluation trenches excavated in 2006. The project was commissioned by Duncan Hawkins of CgMs Consulting and undertaken by Pre-Construct Archaeology Ltd, under the supervision of Stuart Holden and Neil Hawkins. This report was prepared and written by Neil Hawkins.

1.2 The excavation encountered multi-phase archaeological activity from the late medieval/early post-medieval to the late 19th century. This was broken down into thirteen distinct chronological phases, some with further sub-phases. These are; Phase 1 – Natural alluvium, Phase 2 – Late 15th to Late 16th century, Phase 3 – Late 16th century, Phase 4 – Early 17th century, Phase 5 – Early to Mid 17th century, Phase 6 – Mid to Late 17th century, Phase 7 (a, b, c & d) – Late 17th to Mid 18th century, Phase 8 – Mid to Late 18th century, Phase 9 – Late 18th to Early 19th century, Phase 10 – Early to Mid 19th century, Phase 11 – Mid to Late 19th century, Phase 12 – Late 19th century and Phase 13 - Modern. Riverside activity dominates the archaeological record with a sequence of river walls of various constructions predominantly migrating from south to north during the post-medieval period.

1.3 Greenwich Reach is situated on a spur of land immediately to the east of the convergence of the River Ravensbourne (Deptford Creek) and the River Thames. Geologically the site lies within the London (or Thames) Basin consisting of a bed of chalk covered by marine sands, gravels and clays (i.e. Thanet Sands and Woolwich and Reading Beds), over which London Clay formed. The drift geology of the site itself is shown on the British Geological Survey South London map as Floodplain River Terrace gravels overlying the London Clay. This is indicated to be overlain by alluvium associated with the River Thames and River Ravensbourne (Deptford Creek). The archaeological evaluation in 2006 however recorded natural River Terrace gravels overlain by alluvium and organic peat deposits. Such organic horizons are generally associated with marine regression periods, notably the Mesolithic and Bronze Age eras. Settlement evidence such as timber trackways and platforms are often recorded within these horizons. These organic silts can also provide important palaeoenvironmental information regarding climate, ecology and palaeotopography of the area. Only the natural clay alluvium was recorded during the

archaeological excavation however, with no organic silts relating to one of the marine regressions being encountered.

1.4 The earliest evidence of archaeological activity on site was a clay bank river wall. This river wall ran east-west through the excavation and had associated timber wattle fencelines and roundwood bundles, or 'fascines', upon which the bank would have been constructed. The construction of this bank appeared to be staged as it expanded and grew. Each one of these stages was represented by a timber wattle fenceline which defined its limits. This staged process may have been seasonal as and when the bank became breached or eroded. This first recorded phase of activity took place at the beginning of the post-medieval period in the late 15th century. Radiocarbon dating of one of timber wattle fencelines had a date range of AD 1460 to 1660. A second phase of clay bank river wall was recorded at a higher level as the next major phase of activity. Again the limits of this banked river wall were defined by wattle fencelines. It may be that this phase of clay river wall may have just been an extension of the earlier phase. Radiocarbon results from this phase gave a similar date range of AD 1470 to 1660 but most likely occurred during the 16th century. Although the first of these banked river walls was recorded in the early post-medieval period it is not implausible that such a feature was already in existence during the medieval period.

1.5 In the early 17th century the banked river wall was replaced by the first of three phases of timber revetted river wall. These new defensive river walls were simple timber pile and plank structures. The first of these revetments was cut into the clay bank, possibly because it had become eroded or breached and no longer functioned as an adequate barrier. This first phase was collapsed forward slightly itself, most likely the reason for its replacement with the second phase just to the north. This was shortly replaced by a third phase of pile and plank revetting, again just to the north. This third phase was more robust however, having most substantial timber piles and showing evidence of being braced to the north. Dendrochronological results from timbers from the first and third phase of revetting date to after AD 1603 and after AD 1611 respectively. As these dates are relatively close they suggest that these simple pile and plank revetment river walls had relatively short life spans and needed continual upgrading.

1.6 From the late 17th through to the mid 18th century the river wall appears to migrate to the north with more phases of river wall being constructed. This time however the river wall itself was not recorded as it had been truncated by later river walls in the vicinity. Instead features associated with the river walls were recorded. The disturbed

remains of a small dock or inlet were recorded but the river wall it was associated with had been wholly truncated. Lain upon this backfilled dock/inlet was a substantial timber land-tie structure which would have supported a sizeable river wall to the north. Again the river wall itself was no longer extant.

1.7 The mid to late 18th century saw another change to the site. This is illustrated by the cartographic evidence. The earliest map of the site, Rocque's Map of 1741-1746 illustrates the area of the site to be marshland. The next map however, Searles' Plan of the Medcalfe Estate 1777 illustrates that the area of the excavation trench was home to 'Wood Wharf', a boat-building workshop and associated buildings. Recorded during the excavation and dating to the mid to late 18th century was a substantial brick wall. This appeared to represent the river wall of the time, possibly associated with the wharf. A sequence of dumping and consolidation also occurred during this period probably in preparation for the construction of the wharf.

1.8 The late 18th century, through until the mid 19th century, again saw change on the site. Two new phases of timber river wall were erected, this first of which truncated the top of the previously extant brick wall. The first of these phases was a more elaborate timber revetment than the earlier phases; it was constructed from a mortised sill beam with upright posts tenoned into it. Notable amongst the repair timbers in this structure were a number of re-used barge timbers which were rebated and sealed with tarred hair. A second phase of timber revetted river wall replaced the previous one just to its north. This revetment returned to the simple pile and plank technique but on a larger scale. These two phases most likely correlate to the river walls that can be seen on Greenwood's Map of 1827 and the Tithe Map of 1844.

1.9 By the first edition Ordnance Survey Map of 1869 the river frontage had migrated northwards again and a large wharf complex can be seen. This extensive development was Norway Wharf. Two docks or inlets can be seen on this map, extending south from the Thames. These docks were the original focus of the excavation area following their identification within the evaluation trench. Both of these docks were recorded within the excavation area representing the extensive riverside industry of the Victorian period.

1.10 The second edition Ordnance Survey Map of 1894-6 again saw redevelopment. The two docks associated with Norway Wharf had this time had been decommissioned and backfilled. Erected upon these was another large complex of buildings, labelled on the map as 'Stone works'. Again this redevelopment was recorded within the excavation area. A number of timber trestle foundations were recorded cutting the

backfilled docks and appear to represent the large 'stone works' structure on the 1894-6 Ordnance Survey Map.

1.11 Sealing the late 19th century remains were a series of 20th century dump and demolition deposits overlain by concrete, the modern surface level.

1.12 The results of an archaeological investigation at 43-81 Greenwich High Road, which revealed a series of late 18th -19th century tanning pits are presented in Appendix 11 of the present report. A Building Recording report on the same site form Appendix 12.

2 INTRODUCTION

2.1 An archaeological excavation was conducted by Pre-Construct Archaeology Limited at Land at Greenwich Reach, Thames Street, London Borough of Greenwich (Fig. 1). These works were carried out in advance of the proposed redevelopment of the site, and occurred between January and March 2009. The commissioning client was CgMs Consulting. The excavation was supervised by Stuart Holden and Neil Hawkins. Tim Bradley and Jon Butler managed the field work and post-excavation respectively for PCA. Mark Stevenson of English Heritage (GLAAS) monitored the work. Duncan Hawkins of CgMs Consulting monitored the site on behalf of the developer.

2.2 The site was previously occupied bylarge industrial buildings and is bounded by the River Thames to the north, by Norway Street and Wood Wharf to the east, and by Deptford Creek to the south and west (Fig. 1). The central National Grid Reference of the site is TQ 3788 7777.

2.3 The site has previously been the subject of a series of reports:

- Brown, G. 1994. *An Archaeological Desk Top Assessment for Greenwich Reach Development, Greenwich* Pre-Construct Archaeology unpublished report
- Brown, G. 1996. *An Archaeological Desk Top Assessment for a site at Greenwich Reach, London Borough of Greenwich* Pre-Construct Archaeology unpublished report
- Carew, T. 1998. *An Archaeological Watching Brief at Greenwich Reach, Thames Street, Greenwich, SE10* Pre-Construct Archaeology unpublished report
- Bazley, K. 2004. *An Archaeological Watching Brief on Geotechnical Test Pits at Greenwich Reach, Thames Street, London Borough of Greenwich* Pre-Construct Archaeology Ltd, unpublished report
- Mattinson, R. 2005. *An Archaeological Watching Brief on Works to the River Walls at Greenwich Reach, Thames Street, Greenwich, SE10* Pre-Construct Archaeology unpublished report
- Brown, J. 2005. *Historic Area Survey of Land At Greenwich Reach (Dreadnought Wharf, Victoria/Norway Wharf, Thames Street, Greenwich, London Borough of Greenwich, SE10* Pre-Construct Archaeology Ltd, unpublished report
- Holden, S. 2006. *An Archaeological Evaluation at Greenwich Reach, Thames Street, London Borough of Greenwich.* Pre-Construct Archaeology Ltd, unpublished report
- Bradley, T. 2008. *Method Statement for an Archaeological Excavation of Land at Greenwich Reach, Thames Street, London Borough of Greenwich* Pre-Construct Archaeology Ltd, unpublished report

2.4 The site lies within an area of high archaeological potential due to its location on a spur of land immediately to the east of the convergence of the River Ravensbourne (Deptford Creek) and the River Thames. This area has high palaeoenvironmental and archaeological potential and has produced artefactual evidence dating from the Mesolithic to post-medieval eras and is a well known centre for maritime related industries from the late medieval period through to the post-medieval era[1]. For these reasons the site lies within an Area of Archaeological Importance as defined by the London Borough of Greenwich's Unitary Development Plan.

2.5 The Archaeological Desktop Assessment[2] indicated that geotechnical boreholes had located buried peat/organic silt deposits. Such horizons are generally associated marine regression periods, particularly the Mesolithic and Bronze Age eras. These horizons can provide important cultural and palaeo-archaeological information, including qualitative information regarding climate, ecology and palaeotopography.

2.6 The site has been subject to three phases of watching brief. These identified various deposits of post-medieval made ground and alluvial deposits but due to their limited nature the results lacked clarity. Of particular note however was a fragment of chalk wall footings recorded during repairs to the Thameside and Creekside river walls[3].

2.7 The site was subject to an archaeological evaluation in 2006 by Pre-Construct Archaeology Ltd[4]. The evaluation encountered no significant archaeological deposits. Borehole investigations did confirm the presence of organic silts but these were dated to the post-medieval period. The boreholes also provided data on the underlying natural geology and topography recorded natural River Terrace gravel overlain by alluvium. Evaluation trench 3 however recorded a timber revetment of probably 19th century date, interpreted as being part of Norway Wharf indicated on the 1864 Ordnance Survey Map.

[1] Brown, G. 1996. *An Archaeological Desk Top Assessment for a site at Greenwich Reach, London Borough of Greenwich* Pre-Construct Archaeology unpublished report
[2] ibid
[3] Mattinson, R. 2005. *An Archaeological Watching Brief on Works to the River Walls at Greenwich Reach, Thames Street, Greenwich, SE10* Pre-Construct Archaeology unpublished report
[4] Holden, S. 2006. *An Archaeological Evaluation at Greenwich Reach, Thames Street, London Borough of Greenwich.* Pre-Construct Archaeology Ltd, unpublished report

2.8 This phase of archaeological investigations consisted of a single large open area excavation centred on the 2006 evaluation trench 3 (Fig. 2). The methodology involved in these works is discussed in more detail in Chapter 6 of this report.

2.9 The completed archive comprising written, drawn and photographic records and artefacts will be stored by Pre-Construct Archaeology Limited until their eventual transfer to London Archaeological Archive Research Centre (LAARC) at Eagle Wharf Road. Site matrices form part of the archive and can be provided by PCA on request.

2.10 The site was given the site code GQR06.

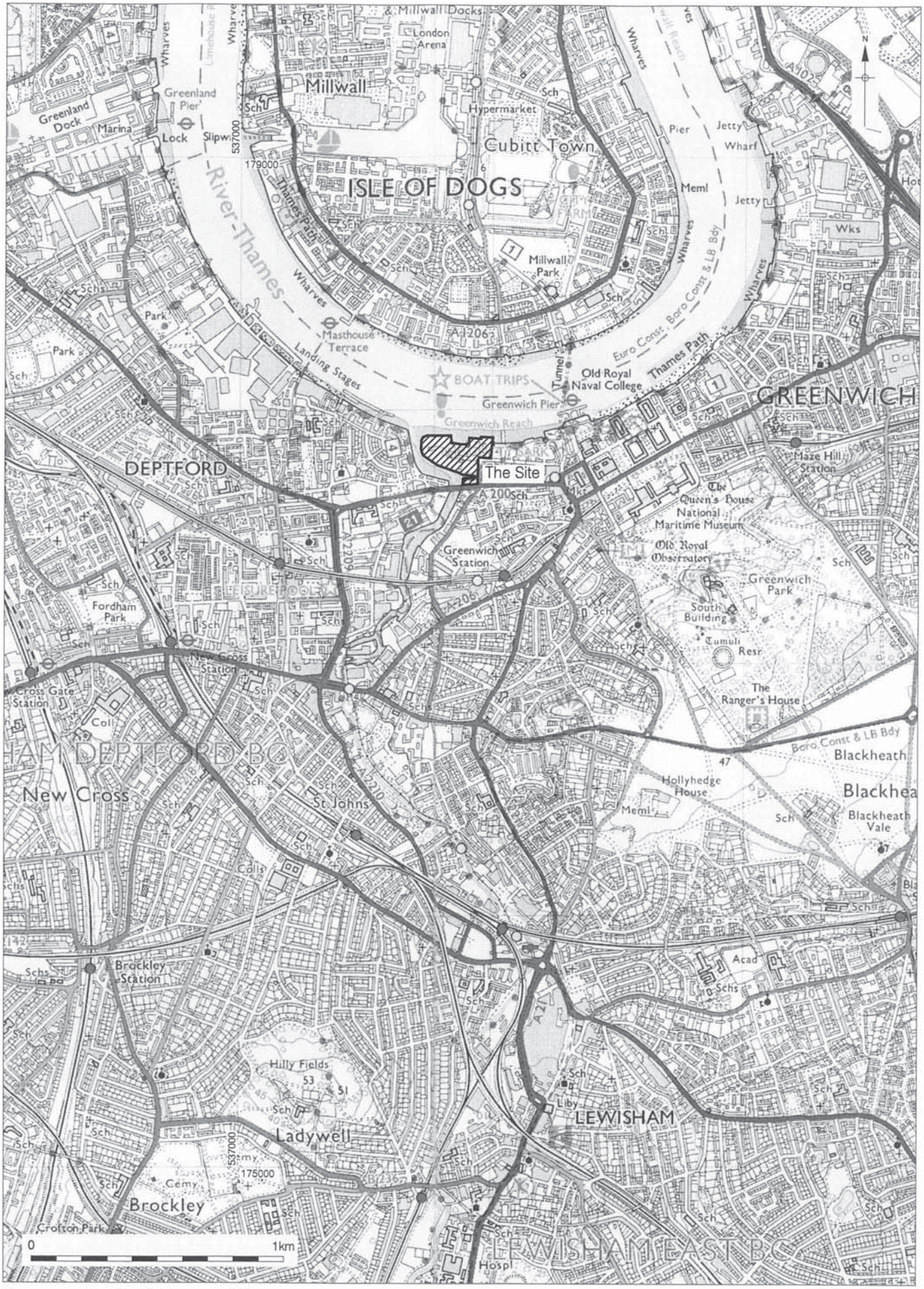

Figure 1
Site Location
1:20,000 at A4

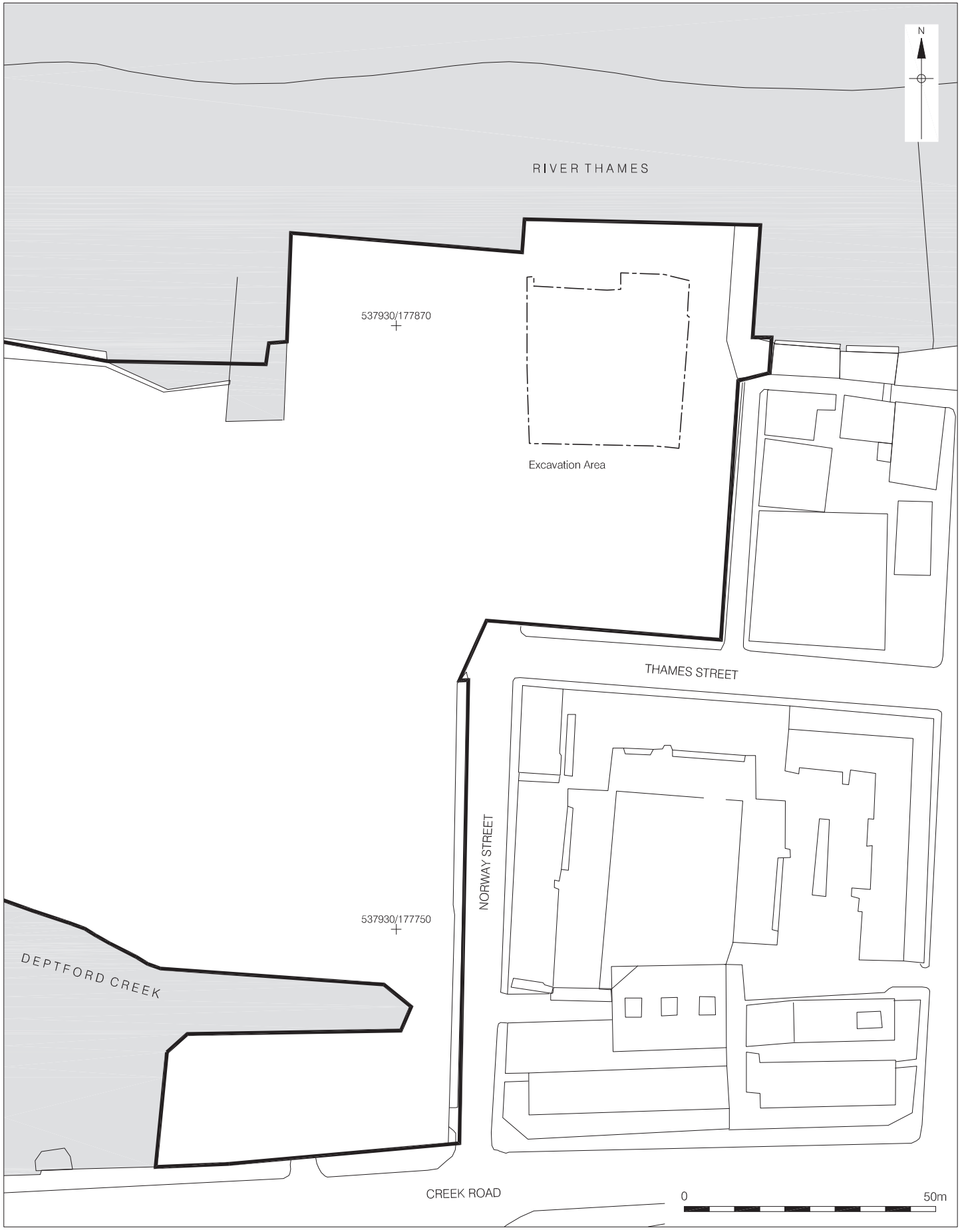

Figure 2
Trench Location
1:1,000 at A4

3 PLANNING BACKGROUND

3.1 Archaeology in Greenwich and the Unitary Development Plan (UDP)

3.1.1 The study aims to satisfy the objectives of the London Borough of Greenwich, which fully recognises the importance of the buried heritage for which they are the custodians. The Borough's deposited second draft 'Unitary Development Plan' 2004 contains policy statements in respect of protecting the buried archaeological resource. This is in line with Planning Policy Guidance Note 16 (PPG 16) 'Archaeology and Planning' issued in November 1990 by the Department of the Environment. It provided guidance for planning authorities, property owners, developers and others on the preservation and investigation of archaeological remains.

3.1.2 The proposed development of the site is subject to the Council's Archaeology Policy:

Archaeology

D29a 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. For sites of lesser importance the Council will seek to preserve the remains in situ, but where this is not feasible the remains should be either 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.

D29b 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.

Reason

6.49 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 which 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. 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 none occasion.

6.50 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.

3.1.3 Mark Stevenson, English Heritage Greater London Archaeological Advisory Service (GLAAS) inspected and monitored the archaeological works on behalf of the London Borough of Greenwich.

3.1.4 There were no Scheduled Ancient Monuments within the footprint of the development.

3.1.5 Following the production of a Revised Desk Top Assessment for the subject site in 1996[5], and after consultation with Mark Stevenson, English Heritage Greater London Archaeological Advisory Service (GLAAS) an evaluation strategy was undertaken that was reported upon in 2006[6]. Based on the findings in this report a mitigation strategy was devised following consultation with Mark Stevenson[7].

[5] Brown, G. 1996. *An Archaeological Desk Top Assessment for a site at Greenwich Reach, London Borough of Greenwich* Pre-Construct Archaeology unpublished report
[6] Holden, S. 2006. *An Archaeological Evaluation at Greenwich Reach, Thames Street, London Borough of Greenwich.* Pre-Construct Archaeology Ltd, unpublished report
[7] Bradley, T. 2008. *Method Statement for an Archaeological Excavation of Land at Greenwich Reach, Thames Street, London Borough of Greenwich* Pre-Construct Archaeology Ltd, unpublished report

4 GEOLOGY AND TOPOGRAPHY

4.1 Geology

4.1.1 The British Geological Survey 1:50,000 Series Sheet 270 (South London) indicates that the site is likely to be underlain by alluvium over Flood Plain Gravel. These in turn overlie Woolwich and Reading Beds and Thanet Beds of Eocene Age.

4.1.2 The archaeological evaluation in 2006 recorded natural gravel and alluvium consistent with the known underlying geology as described on the British Geological Survey within all the evaluation trenches[8].

4.1.3 The excavation area recorded natural alluvial layers within a deeper machine cut sondage in one specific location. These were consistent with the known underlying geology as described on the British Geological Survey and as encountered with the evaluation trenches excavated in 2006. This natural alluvium was recorded at -0.25m OD and was at least c. 0.70m thick, continuing below the excavated level.

4.2 Topography

4.2.1 The topography of the surrounding area is generally flat, being situated on the Thames Valley floor. It begins to rise sharply to the south and east as the most recent of the Pleistocene terraces – the “Kempton Park” terrace – is encountered.

4.2.2 Greenwich Reach is situated on the spur of land immediately to the east of the convergence of the River Ravensbourne (Deptford Creek) and the River Thames.

4.2.3 Topography of the site itself is varied due to demolition having taken place. Height varies generally between 5m OD and 6m OD but in some places is closer to 7m OD.

[8] Holden, S. 2006. *An Archaeological Evaluation at Greenwich Reach, Thames Street, London Borough of Greenwich.* Pre-Construct Archaeology Ltd, unpublished report

5 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

5.1 Introduction

5.1.1 The following section is taken from the initial watching brief reports and the original desk-based assessment[9].

5.2 Prehistoric

5.2.1 There has been little in the way of solid evidence linking the earliest peoples to this part of the Thames valley. Although both Palaeolithic and Mesolithic finds have been made, the likelihood for them to have been found *in situ* is less than that of later stone tools. Neolithic cultural materials on the other hand, have been found on the site (polished stone axehead) or close by (flint flakes in a pit at Deptford Broadway).

5.2.2 Marshy deposits on both sides of the River Thames have revealed an abundance of Bronze Age materials and timber trackways are not uncommon. Of evidence from this particular area, a flanged axe and palstave were recovered nearer to the head of the River Ravensbourne (Deptford Creek). It is thought, however, that this activity represents seasonal exploitation rather than occupation.

5.2.3 The only recorded Iron Age find is that of a saddle quern fragment at Deptford Broadway.

5.3 Roman

5.3.1 Roman finds from the vicinity have been plentiful. Examples include a coin from the Power Station site (SOA96) and various bronze artefacts including a lamp from nearby Deptford Broadway. Roman materials have been found all along the Thames estuary at different levels including some from beneath peat deposits at Woolwich.

[9] Brown, G. 1996. *An Archaeological Desk Top Assessment for a site at Greenwich Reach, London Borough of Greenwich* Pre-Construct Archaeology unpublished report
Mattinson, R. 2005. *An Archaeological Watching Brief on Works to the River Walls at Greenwich Reach, Thames Street, Greenwich, SE10* Pre-Construct Archaeology unpublished report
Carew, T. 1998. *An Archaeological Watching Brief at Greenwich Reach, Thames Street, Greenwich, SE10* Pre-Construct Archaeology unpublished report

5.3.2 The site is close to the Roman thoroughfare known as Watling Street. However, the exact position of the road between Shooters Hill to the east and Southwark to the west is a matter of some dispute.

5.4 Saxon and Medieval

5.4.1 There are no recorded finds in the immediate vicinity from before the Norman Conquest, though there is a pre-Domesday Book reference for a settlement – Meretun – either near to Deptford Strand or Deptford Broadway. Excavations at the Broadway produced a Saxon grave with grave goods. Saxon pottery was immediately to the west of St. Nicholas Church, which itself may be of Saxon origin. Middle Saxon pottery was also found within a ditch adjacent to the east side of the church[10].

5.4.2 According to a 10th century charter, land to the east of the Ravensbourne was lost to Vikings and in 1016, Edward the Confessor promised he would recover the lost land.

5.4.3 Post-Domesday records seem to show that much of the land held by abbeys in the area was falling into a poor state. This was primarily due to repeated inundation and general lack of maintenance. There are in fact, no recorded details of land management at that time.

5.4.4 It is generally believed that land next to the banks of the Ravensbourne and Thames in the vicinity was used primarily as meadow or pasture as no evidence of medieval or early post-medieval buildings have been found.

5.5 Post-Medieval

5.5.1 Map regression techniques demonstrate the sequence of land-use post-1746. Rocque's map from this year shows no development east of the Ravensbourne.

[10] Divers, D. 2004. 'Excavations at Deptford on the site of the East India Company dockyards and the Trinity House almshouses, London', *Post-Medieval Archaeology* 38/1, 17-132.

5.5.2 A programme of archaeological observation and recording was undertaken in 2005 at Wood Wharf, adjacent to the eastern boundary of the subject site[11]. An east-west orientated drainage channel 4 to 5m wide was found, running through the centre of the site that may have been dug in the early to mid 17th century. This underwent stages of timber revetment through the early 18th century, gradually becoming contracted to around 1m in width before being filled in, probably sometime between 1730 and 1750. By the time of Searles' map of the Medclafe Estate 1777, this site is occupied by a boat building yard and annotated as *Wood Wharf.*

5.5.3 Searles' map shows that the area subject site is partially located upon what was known as Brooks Marsh, indicating its waterlogged condition. At the western end of the peninsula and on the eastern side of the bend in Deptford Creek are two low-lying areas of oziers (productive reed beds). Laurie's 1821 map then shows the emergence of a street pattern, with Norway, Creek and Thames Streets being shown. A timber yard has also now appeared replacing the boat building yard and extending onto the subject site. The timber yard is also present on Greenwood's map of 1826.

5.5.4 The Phoenix Gas Works appears in 1838, occupying most of the west side of the site. It is presumed that around this time revetted river defences were constructed as land-use became much heavier. By the time of the 1864 Ordnance Survey map the gas works had been extended and is joined by an iron ship building yard on the north of the site and an ironworks on the south side. In 1893 there was a large coal depot towards the centre of the site.

5.5.5 The Phoenix Gas Works was replaced by aggregate production and storage after the Second World War and since then the site has been home to industries such as scrap metal merchants and vehicle mechanics.

5.6 Previous Work

5.6.1 The watching brief undertaken by PCA in 1997 under the sitecode NWS 97[12], constituted the archaeological monitoring of seventeen test pits and seven boreholes. This work identified that beneath several metres of 19th and 20th century made ground, alluvial deposits were present that had the potential to contain archaeological

[11] Compass Archaeology 2005. *Wood Wharf and adjacent playground site, Horseferry Place/Thames Street, Greenwich SE10 London Borough of Greenwich: An Archaeological Standing Building Record and Programme of Archaeological Observation and Recording* Compass Archaeology unpublished report
[12] Carew, T. 1998 *An Archaeological Watching Brief at Greenwich Reach, Thames Street, Greenwich, SE10* Pre-Construct Archaeology unpublished report

material either within or on top of them. Layers of peat were identified and the level of the natural gravels recorded within the boreholes.

5.6.2 A watching brief was undertaken by PCA in 2004 during the excavation of geotechnical test pits[13]. Of the fifty-seven excavated, fourteen were monitored archaeologically with made ground recorded in each of them. River wall tie-backs and two instances of 20th century river wall were also revealed.

5.6.3 The watching brief, also undertaken by PCA, in 2005 under the sitecode RWW 05[14], constituted the archaeological monitoring of the insertion of new river walls and repairs to those extant. Chalk foundations of possible late-medieval river revetment and timber revetments of post-medieval date were recorded along sections of the river walls in the northeastern part of the site.

5.6.4 The site was subject to an archaeological evaluation in 2006 by Pre-Construct Archaeology Ltd[15]. The evaluation encountered no significant archaeological deposits. Borehole investigations did confirm the presence of organic silts but these were dated to the post-medieval period. The boreholes also provided data on the underlying natural geology and topography recorded natural River Terrace gravel overlain by alluvium. Evaluation trench 3 however recorded a timber revetment of probably 19th century date, interpreted as being part of Norway Wharf indicated on the 1864 Ordnance Survey Map.

[13] Bazley, K. 2004 *An Archaeological Watching Brief on Geotechnical Test Pits at Greenwich Reach, Thames Street, London Borough of Greenwich* Pre-Construct Archaeology Ltd, unpublished report
[14] Mattinson, R. 2005 *An Archaeological Watching Brief on Works to the River Walls at Greenwich Reach, Thames Street, Greenwich, SE10* Pre-Construct Archaeology unpublished report
[15] Holden, S. 2006. *An Archaeological Evaluation at Greenwich Reach, Thames Street, London Borough of Greenwich.* Pre-Construct Archaeology Ltd, unpublished report

6 METHODOLOGY

6.1 An archaeological evaluation conducted in 2006, consisted of six trenches[16]. The evaluation encountered a number of timber revetment structures within evaluation trench 3. Based upon this evaluation a mitigation strategy was formulated by Duncan Hawkins of CgMs Consulting in consultation with Mark Stevenson of English Heritage Greater London Archaeological Advisory Service. This methodology is described in detail in the Method Statement[17] but a brief account will be summarised below.

6.2 The mitigation consisted of a single open area excavation measuring approximately 40m x 40m. An area of 10m was maintained between the river wall and the archaeological excavation area. The excavation of this area involved the removal of the concrete slab, modern overburden and any deposits below these by 360^{o} mechanical excavators with breakers and flat bladed ditching buckets until archaeological horizons were encountered. This work was undertaken under archaeological supervision. All investigation of archaeological levels, features and structures was then continued by hand, with cleaning, examination and recording both in plan and in section.

6.3 The site archive was organised as to be compatible with its eventual deposition with the London Archaeological Archive and Research Centre (LAARC) at Eagle Wharf Road. Individual descriptions of all archaeological strata and features excavated and exposed were entered onto prepared *pro-forma* recording sheets which include the same fields of entry as found on the recording sheets of the Museum of London. Sample recording sheets, sample registers, finds recording sheets, accession catalogues, and the photography record cards followed the Museum of London equivalents. This requirement for archival compatibility extends to the use of computerised databases.

6.4 A record of the full extent in plan and section of all archaeological deposits as revealed in the investigation was made; these plans were on polyester based drawing film, were related to the site grid and at a scale of 1:10 and 1:20. 'Single context

[16] Holden, S. 2006. *An Archaeological Evaluation at Greenwich Reach, Thames Street, London Borough of Greenwich.* Pre-Construct Archaeology Ltd, unpublished report
[17] Bradley, T. 2008. *Method Statement for an Archaeological Excavation of Land at Greenwich Reach, Thames Street, London Borough of Greenwich* Pre-Construct Archaeology Ltd, unpublished report

planning' was used on stratified deposits. Where possible the information was digitised for eventual CAD application.

6.5 OD heights of all principal strata and features were calculated and indicated on the appropriate plans and sections.

6.6 A 'Harris Matrix' stratification diagram was used to record stratigraphic relationships. This record was compiled and fully checked during the course of the excavations. Spot dating was incorporated where applicable during the course of the excavation.

6.7 Full photographic records of the investigations were prepared. This included black and white prints and colour transparencies (on 35mm film), illustrating in both detail and general context the principal features and finds discovered. The photographic record also included 'working shots' to illustrate more generally the nature of the archaeological investigation. The transparencies were mounted in suitable frames for long-term curation in preparation for deposition with the archive.

6.8 The excavation area was surveyed into the National Grid and a CAD drawing produced showing their location.

6.9 Two temporary benchmarks were established on the site during the excavation, 3.14m OD and 3.17m. These temporary benchmarks were installed using a GPS survey system.

6.10 The site was given the site code GQR 06.

7 THE ARCHAEOLOGICAL SEQUENCE

7.1 Phase 1: Natural Alluvium (Fig. 18)

7.1.1 The earliest deposit recorded across the site was a sequence of natural alluvial clay, [502] & [503]. These layers were encountered within the limited area of a sondage at the southern end of the site. These were recorded at a highest level of -0.25m OD and had a combined thickness of 0.71m. These deposits appear consistent with alluvial clay recorded via augering during the archaeological evaluation in 2006 (Holden 2006).

7.2 Phase 2: Late 15th to Late 16th Century (Figs. 3 & 18))

Wattlework and Fascine Structures [485], [479], [484], [477] & [476] and Associated Clay River Wall

7.2.1 The earliest phase of human activity recorded on the site was the remnants of a clay bank, defined by wattle fences, combining to form a river wall. Recorded through the length of a deeper slot excavated through the site were four lines of wattle fences, [485], [479], [484] & [477], all running east-west. The vertical wattlework varied in robustness between small, round, oak stakes and cleft oak pole sections. Related to these wattle fences were small timber rods, or 'fascines', [476]. These were laid on the ground in bundles, and acted as a 'mat' upon which the clay bank was constructed. These were recorded between 1.15m OD and 1.05m OD. The four lines of these wattle fences may relate to a multi-phase, staged construction of the river wall. This may have been seasonal as the wall expanded possibly northwards or even both north and south outwards, becoming a larger clay bank. Radiocarbon dating of the timbers from one line of wattlework, [479], dated to AD 1460 to 1660 (Appendix 8).

7.2.2 Sealing the wattle were a series of clay layers which probably formed the bank itself, [509], [507], [478], [411], [501], [533], [508] & [511]. These had a highest level of c. 2.16m OD and a combined thickness of c. 1m. In section these layers could be seen to slope down to the south, possibly representing the landward side of the clay wall at some point.

7.2.3 Also recorded within the sequence of clay layers representing the bank was a small area of possibly collapsed revetment, timbers [552] & [553]. An area measuring 0.68m wide by 1.34m long of these timbers was exposed revealing two timber

uprights apparently collapsed towards the north. Upon both sides of these uprights timber planking was nailed. The planking on the northern face of this possibly collapsed revetment was clinker ship boards held together with iron rivets. These apparent ships timbers continued west past the limit of excavation of the slot but did not continued east. These were recorded at c. 1.21m OD, sloping down to 0.69m OD. Dendrochronological results from these timbers dated to after AD 1549 (Appendix 6). These timbers may represent a revetted frontage to another phase of mud river wall.

7.3 Phase 3: Late 16th Century (Figs. 4 & 18)

Wattlework and Fascine Structures [403] & [404] and Associated Clay River Wall

7.3.1 Laid upon elements of the earlier clay bank during this period was another phase of wattle fences and 'fascines', representing the construction of a new clay bank river wall also running east-west. Wattle fence [403] and associated 'fascines' [404] were recorded at c. 1.57m OD and probably represent the northern limit of the river wall. Only a small representative area of these 'fascines' were fully excavated. Another section of wattle was recorded slightly further south of [404]/[403] at a similar height of c. 1.60m OD. This was encountered only within section however and may represent a staged, multi-phased construction of the river wall as it expands, similar to those recorded during the previous phase. Radiocarbon dating of some of the timbers from wattlework, [403], dated to AD 1470 to 1660 (Appendix 8).

7.3.2 Another sequence of layers was again recorded above these wattle features, [500], [518], [519], [534], [521] & [535], most likely representing the clay bank which they were integral to. These layers had a highest level of 2.40m OD and had a combined thickness of c. 0.80m. As with the previous phase of river wall, the profile of a bank sloping down towards the south can clearly be seen in section. These deposits represent the southern and landward side of the clay bank. The northern side, which would have been directly above the wattlework was truncated away by later river walls.

7.4 Phase 4: Early 17th Century (Figs. 5 & 18)

First Phase of E-W Revetted River Wall [412]

7.4.1 Cutting through an area of the earlier clay bank deposits was a timber revetment structure [412]. Running east-west for 14.80m this revetment was composed of horizontal, on-edge, timber planks supported by driven timber piles. The planking was set on the southern, landward side of the revetment. The planks were mostly sawn softwood with some re-used oak planking also being present. The piles were oak, set around 1m apart, some of which were whole logs and others were sawn half logs (Appendix 5). Timber pile [497] from the revetment structure was dated via dendrochronology to after AD 1603 (Appendix 6). Recorded at c. 2.28m OD this revetment was 0.90m deep and had collapsed slightly northwards. This revetment represented a river wall, with the northern side being the river and the south landward. The nature and size of this river wall meant that it was unlikely any boats would have moored alongside it. It therefore only represented a defensive river wall.

7.5 Phase 5: Early to Mid 17th Century (Figs. 6 & 18)

Second Phase of E-W Revetted River Wall [558]

7.5.1 Recorded to the north of the revetted river wall in the previous phase was another timber revetment, [558], which again represented a river wall. The revetment was composed of horizontal on-edge timber planking supported by driven timber piles. This revetment structure was broadly similar to its predecessor [412] but the planking this time was on the northern, Thames side and was fastened on with iron nails. The planking was sawn softwood and some sawn elm. The piles were set closer together than earlier structure [412], some of them were also set in pairs presumably for extra strengthening. These piles were oak and were a mix of cleft and sawn half and whole logs (Appendix 5). The timber piles were recorded at a highest level of 2.36m OD and the planking was recorded at 2.18m OD. The exact depth of the revetment was unrecorded as it remained unexcavated. It ran for c. 16m east-west through the site. This second phase of east-west revetted river wall appears to have migrated only around 0.60m north from the original phase, [412].

7.5.2 Laid upon clay deposit [508] was a timber oak box beam [562]. This single timber was recorded at 1.79m OD and was a boxed half timber with mortices and rebates. This timber was 15th century in character and may have been reused on the foreshore to support an upright post. This may have been part of a larger structure such as an overhanging toilet or fishing platform. It is unclear whether this feature relates directly to this phase of river wall.

7.6 Phase 6: Mid to Late 17th Century (Figs. 7 & 18)

Third Phase of E-W Revetted River Wall [557]

7.6.1 Recorded just north of the second phase of revetted river wall, [558], was a third phase, [557]. This third phase of river wall again only migrated c. 0.50m north from the second phase it replaced. Running c. 19.90m east-west across the site this revetment was composed of horizontal on-edge timber planking supported by driven timber piles. The planking was imported softwood identified as one of the pines (Appendix 5). These planks were nailed to the northern, river side of the piles. The piles were oak, heavier than those in the previous two phases of revetted river wall, many of which were off-cuts from making other timbers, possibly ships frames (Appendix 5). One of the timber piles, [496], provided a dendrochronological date of after 1611 (Appendix 6). The timber piles were recorded at a highest level of 2.34m OD and the planking, of which only two and a half courses survived, was recorded at 2.22m OD. The revetment was 0.76m deep.

7.6.2 Recorded c. 0.60m north of revetted river wall [557] were a group of timbers that may have represented front bracing for it, [561]. These timbers were an irregular line of sloping chocks and stakes, recorded at c. 1.62m OD. These would originally have supported raking shores sloping upwards towards the timber frontage.

7.6.3 Recorded just to the north of revetted river wall [557], at its eastern end, were two tree roots, [336] & [341], apparently growing in situ. These may have begun growing growing directly north of the river wall as the area began to silt up.

7.7 Phase 7: Late 17th to Mid 18th Century (Fig. 8)

Sub-Phase A
Disturbed Phase of Timber Land-Ties [568]

7.7.1 The next phase of activity is represented by a small group of disturbed timbers which appear to represent a phase of truncated land-ties, [568]. This disturbed group consisted of an oak land-tie beam and an elm pole lock bar set in a socket cut through the oak beam. The lock bar was a retained by two square stakes. These were recorded at c. 1.60m OD. The wall which the land ties supported was not recorded and would have been truncated by any one of the numerous later phases of river wall in the area.

7.8 Phase 7: Late 17th to Mid 18th Century (Fig. 9)

Sub-Phase B
Disturbed Dock/Inlet [347] & [365]

7.8.1 Recorded at the eastern end of the excavation area, just north of timber revetted river wall [557] were another two lines of revetment structures, [347] & [365]. Both these structures were composed of horizontal, on-edge timber planking, supported by driven timber piles. Revetment structure [347] ran northnortheast-southsouthwest just north of revetted river wall [557]. Revetment structure [365] was 4.5m east of [347] and ran north-south just north of revetted river wall [557]. These two revetments together formed a small inlet or dock. The eastern half of this inlet, [365], was badly disturbed by later activity but was recorded at a highest level of c. 2.48m OD. The western half of the inlet, [347], was also badly truncated and survived to a highest level of 1.86m OD. The base of the western planking was recorded at c. 0.35m OD, making the inlet at least 1.50m deep. The planking within both structure [347] and [365] was again softwood and the piles were predominantly oak. The depth of the inlet would have enabled shallow draft vessels to moor within it. The river wall which would have been associated with this dock/inlet to the north did not survive, most likely being truncated by one of the many later phases of river wall.

7.9 Phase 7: Late 17th to Mid 18th Century (Figs. 10 & 18)

Sub-Phase C
Timber Land-Ties [559] & [309]

7.9.1 Recorded across the entirety of the excavation area were eight timber beams and other associated timber assemblies, structure [559]/[309], which represented the land-ties of a river wall. These were laid upon clay deposit [543] which had built up during the last phase of east-west revetted river wall [557]. Aligned north-south and all running parallel to each other, these land ties encompassed an area measuring 18.75m east-west by 6.20m north-south. These timber beams sloped down from a level of c. 1.88m OD at their northern end to c. 1.18m OD at their southern end. Each timber assembly comprised a main oak beam running north-south for over 6m in length, hewn from a straight, whole log. Associated anchor stakes were of oak, cut from off-cuts derived from nearby shipbuilding. The tops of these stakes were neatly bevelled with axes or adzes. The associated lockbars were tapered, fitted into tapering undercut laps cut into the upper faces of the beams. The highest level of these associated anchoring stakes and lock plates was c. 2.43m OD. The sloping of these timbers down from north to south illustrates that they were associated with a more substantial river wall which would have been located to the north. The use of

such substantial timbers suggests that the river frontage was relatively tall, perhaps at least 2m high (Appendix 5). However, no evidence of this river wall survived as numerous later phases of wall completely truncated it.

7.9.2 Recorded in the northwest area of the land-tie structure [559] was a slightly smaller oak beam running northwest-southeast. This cross section beam was fastened to two of the north-south land-tie beams discussed above with iron spikes. This suggests that it was reinforcing a corner of the frontage. This implies that there may have been another inlet just to the west of the excavation area (Appendix 5). However, no other evidence for such a feature was recorded during the excavation.

7.9.3 Recorded at a similar level to the phase of timber land-ties [559] was a timber structure, [564], which did not appear to relate to any others. This structure was comprised of an oak plank pad with a mortice and three oak wedges in it. Lying directly north of it was a softwood pole with a triangular tenon at its base which had collapsed off of the base. These clearly fitted one another and probably formed part of some other larger structure in the area (Appendix 5). The collapsed upright was recorded at c. 1.86m OD and the baseplate itself was recorded at 1.77m OD.

7.9.4 Also recorded during this phase of activity was an extensive cut feature [516]. This feature was only recorded in section at the southern end of the site and appeared to cut through the clay layers which formed the clay bank river wall. This feature was recorded at 3.26m OD and was c. 1.05m deep. As it was only recorded in section its exact nature is hard to ascertain, however it may be some form of landscaping feature altering the terrain to the south of the river wall which stood during this period. Alternatively this feature may represent a series of layers dumped at the back of the clay bank river wall to level the ground for subsequent development.

7.10 Phase 7: Late 17th to Mid 18th Century (Fig. 11)

Sub-Phase D

Anomalous Timber Group [563]

7.10.1 A group of disassociated timbers, [563], were recorded across the excavation area which did not appear to relate to any other phase. These include an oak beam, oak and softwood stakes and softwood planking. These timbers were encountered between c. 1.90m OD and c. 1.60m OD. These timbers may represent the remnants of various temporary structures along the frontage. Further analysis may provide

possible functions for these timbers which are grouped and given their own sub-phase out of convenience.

7.11 Phase 8: Mid to Late 18th Century (Figs. 12 & 18)

Brick River Wall [408] & Dumping Sequence

7.11.1 Sealing the phase of timber land-ties [559] across the site were a series of dump layers, [567], [545], [542], [544], [549], [355], [524], [539] & [548]. This sequence of dumped deposits had a highest level of c. 2.75m OD and an overall thickness of c. 0.90m. To the north of these, truncating the land-tie structure [559] was a brick wall, [408], running east-west. Recorded at c. 1.71m OD the top of this brick river wall was truncated by the construction of later river walls. This brick river wall was only exposed in two distinct areas, it was 0.80m wide and its length was c. 12.50m but it is assumed it would originally have continued throughout the area. The wall was excavated to 1.30m deep with seventeen courses of brickwork being recorded; the wall continued below this level however and was not fully excavated due to health and safety reasons. Brick samples recovered from the wall dated it to 1750-1800. Four timber posts were also recorded along the northern frontage of the wall and may represent support for it or mooring posts.

7.12 Phase 9: Late 18th to Early 19th Century (Figs. 13 & 18)

Timber River Wall [555]/[356]

7.12.1 Truncating the top of the brick river wall [408] was the construction of a new timber river wall, [555]/[356]. This new timber river wall ran east-west across the site, but on a slightly different alignment to the brick wall [408]. This timber river wall was more elaborate than any of the previous phases recorded to the south. The structure was composed of a mortised sill beam with upright posts tenoned into the sill beam as opposed to timber piles. Horizontal on-edge timber planking was attached to the northern, Thames side, of the posts. Four courses of these horizontal on-edge planking were recorded and the wall had an overall recorded depth of 1.11m. The timber posts were oak box quartered or box halved in conversion re-used from timber framed buildings (Appendix 5). The planking ranged from oak, elm and softwoods, many of which were re-used carvel built ship and barge timbers. Many of the timbers were in fact re-used second timbers and off-cuts. A number of specific re-used carvel ship planking was recorded at the eastern end of this wall. Of particular note were a number of re-used barge timbers at the eastern end of the river wall used as repairs. These softwood planks were rebated and sealed with tarred hair and were most likely re-used from the bottom of a barge (Appendix 5). Recorded at c. 2.61m OD the

length of this river wall was 20.90m across the excavation area. It is suggested that the original height of this timber river wall may have been well over 3.0m OD (Appendix 5).

7.12.2 Also recorded during this phase was cut [547] which truncated the sequence of dump layers from the previous phase. This feature was only recorded in section and was backfilled by deposit [546] which had frequent amounts of chalk rubble within it. The feature was recorded at 2.58m OD and was 0.75m deep. As it was only recorded in section its exact shape and function is hard to determine, what is unusual however is the chalk rubble within its fill.

7.13 Phase 10: Early to Mid 19th Century (Fig. 14)

Timber River Wall [556]

7.13.1 In the early 19th century another new timber river wall was constructed, structure [556]. Erected c. 1.40m north of timber river wall [555]/[356] from the previous phase it effectively ran parallel to it. The area between the two phases of river wall was backfilled by a mixture of dumped deposits, [400], [399], [398] & [397]. Timber planking was also installed between the two phases, [560], perpendicular which may have acted as support for the later phase and also made it easier to backfill the space between them. This phase of timber river wall was composed of timber piles supporting horizontal on-edge timber planking. The planks were manually sawn softwood and the upright piles were boxed heart or sawn box halved in conversion. The planking was on the southern, inland side of the supporting piles. It was recorded running for 23.74m east-west through the site but continued west outside the limit of excavation. The eastern end was truncated by later activity. Three courses of timber planking survived and had a total depth of 1.13m. The timber planks in the river wall were recorded at 2.91m OD and the timber piles at 3.14m OD.

7.13.2 Also recorded during this phase were a number of layers and apparent cut features, these were however only encountered in section. An extensive cut, [522], was recorded truncating dumps on the landward side of the river wall [556]. Three smaller cuts, [527], [529] & [532], were recorded cutting through the top of more extensive feature [522]. All these features were recorded at c. 3.13m OD and may relate to structures and activities occurring south of the river wall on dry land.

7.14 Phase 11: Mid to Late 19th Century (Fig. 15)

19th Century Dock [401] & Slipway [402]

7.14.1 By the mid 19th century timber river wall [556] from the previous phase was out of use. The river wall had apparently moved north again, although outside of the limits of the excavation area. Recorded within the excavation area were two dock features, structures [401] & [402]/[285]. On the western side of the excavation area was a small inlet or possible slipway, structure [402]/[285], and on the eastern side of the excavation area there was a larger dock, structure [401]. Small inlet or slipway [402]/[285] (of which 402 represented the western side and [285] the eastern side) was composed of large timber piles which supported two courses of horizontal on-edge softwood timber planking. It measured 9.40m wide by 4.12m long, but would have continued north past the limit of excavation. It was recorded at c. 3.17m OD and was only 0.46m deep. It is assumed however that this inlet or slipway would have sloped down north towards the Thames, becoming deeper. Timber structure [401] was a larger, more robust structure composed again of timber piles supporting horizontal on-edge timber planks. The later dock timbers were made of softwood whilst recycled oak ship timbers and off cuts were recorded in the lower elements of the structure. These were recorded at a highest level of 3.95m OD and the dock had an overall depth of c. 2.16m. The length of the dock exposed was c. 13m north-south but it continued both north and south outside the limits of the excavation area. Timber structure [401] represented the western side of a larger dock or inlet. Both these dock structures are clearly visible on the Ordnance Survey map of 1869 which illustrates the river wall to be further north in virtually the same position as the modern river wall.

7.15 Phase 12: Late 19th Century (Fig. 16)

19th Century Timber Trestle Foundations [565]

7.15.1 By the late 19th century the two docks [402] and [401] from the previous phase had been decommissioned and backfilled. Recorded in the excavation area cutting through the backfilled deposits of these docks were sixteen timber trestle foundations, structure [565]. These trestle foundations consisted of horizontal beams of varying sizes with a tenoned in upright post supported by two diagonal braces. Many of these timbers were re-used from second hand ships timbers. These include re-used softwood ships timbers from a foreign ship probably of North American or Scandinavian origin (Appendix 5). They were recorded between 3.06m OD and 2.80m OD. These foundations encompass virtually the entire excavation area along with a number of other associated other timber posts and most likely relate to the ‘stone works’ building illustrated on the Ordnance Survey Map of 1894-6.

7.16 Phase 13: Modern

7.16.1 Sealing the late Victorian activity across the site was 20th century made ground which was overlain by late 20th concrete. The highest level of this concrete, the modern ground level, was c. 5.20m OD

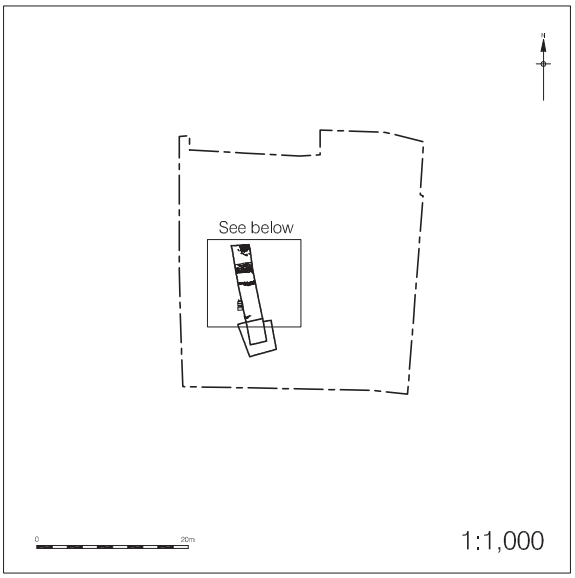

Figure 3
Phase 2: Late 15th to Late 16th century
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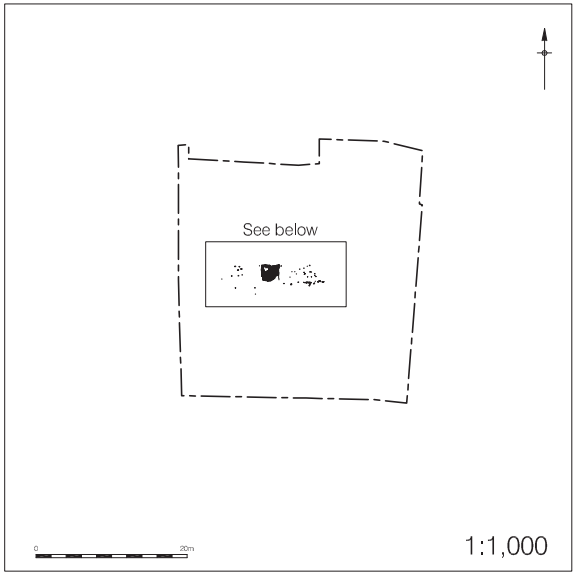

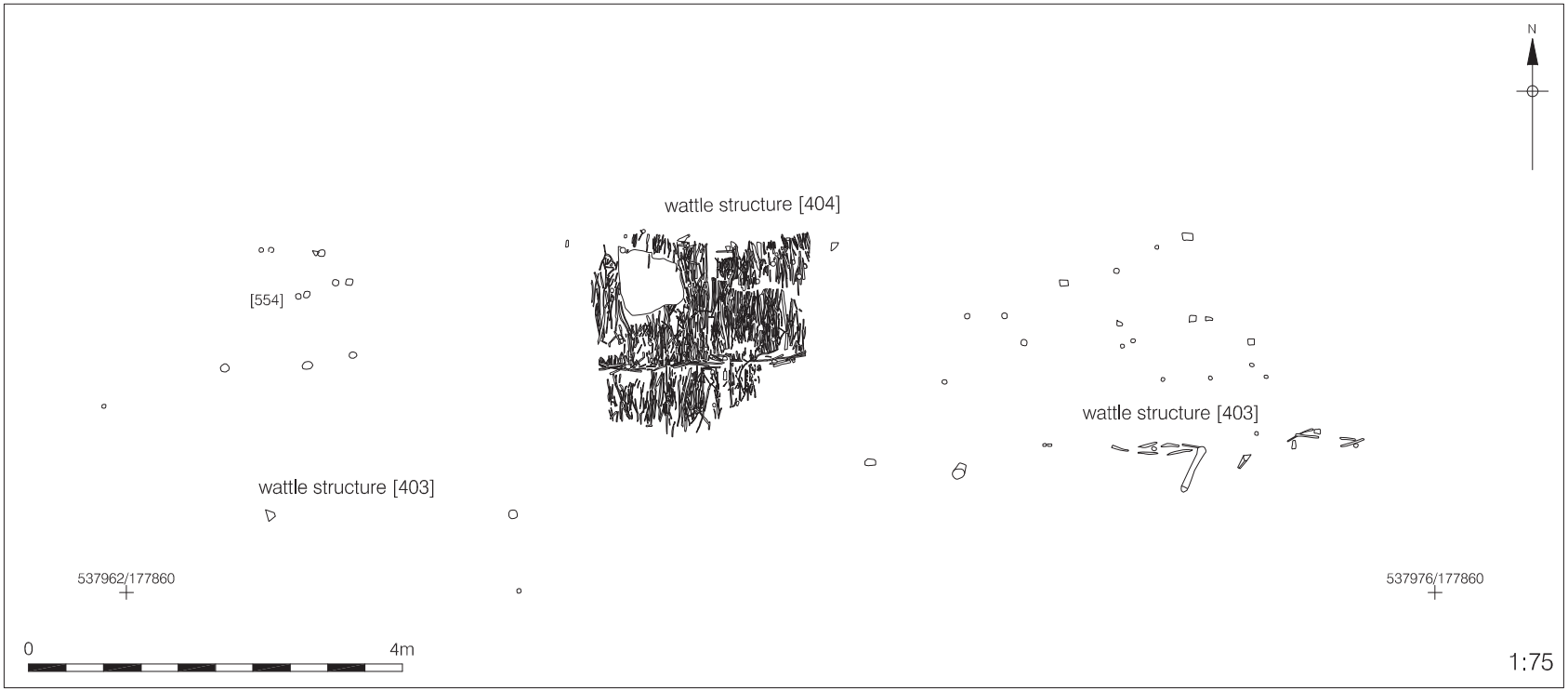

Figure 4
Phase 3: Late 16th century
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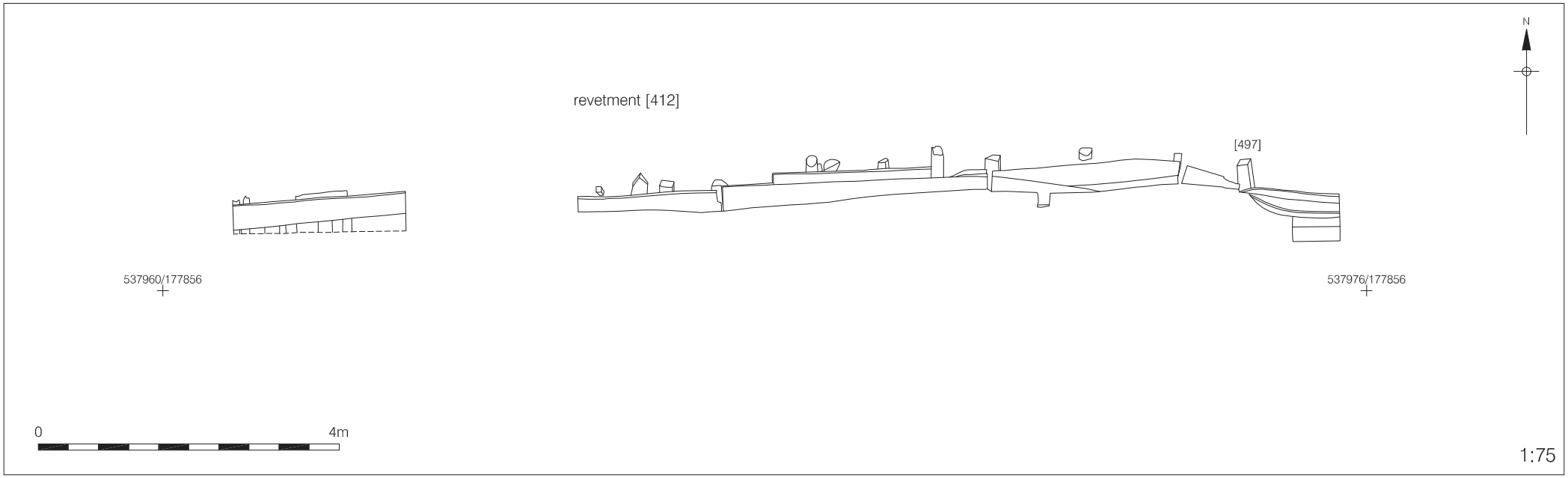

Figure 5
Phase 4: Early 17th century
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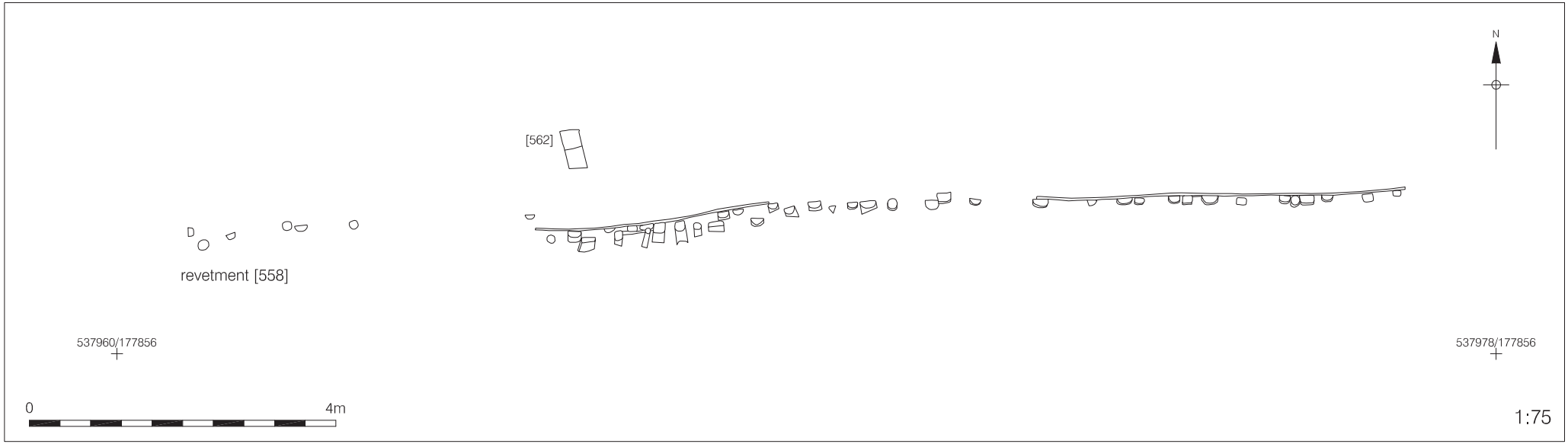

Figure 6
Phase 5: Early to Mid 17th century
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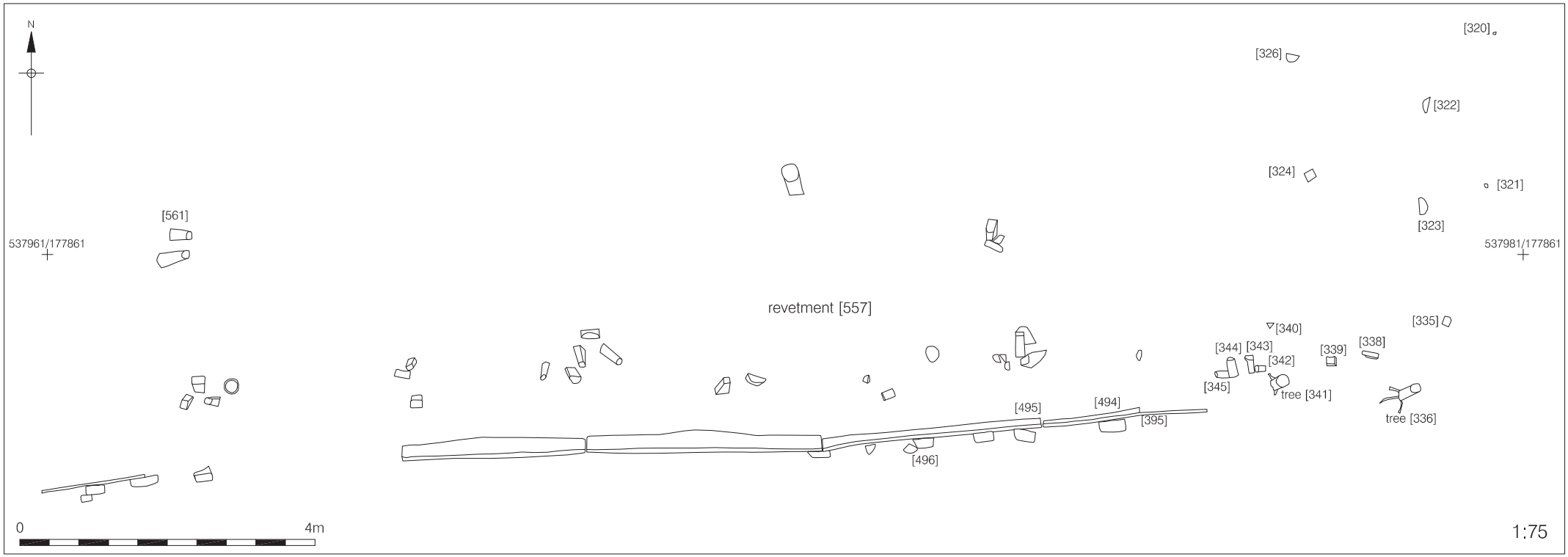

Figure 7
Phase 6: Mid to Late 17th century
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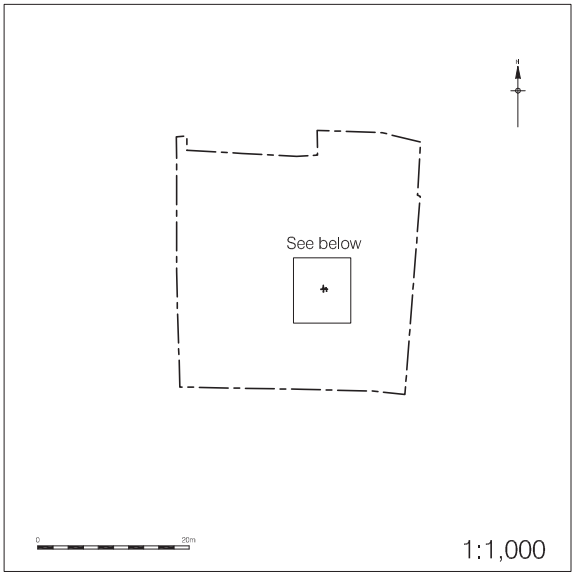

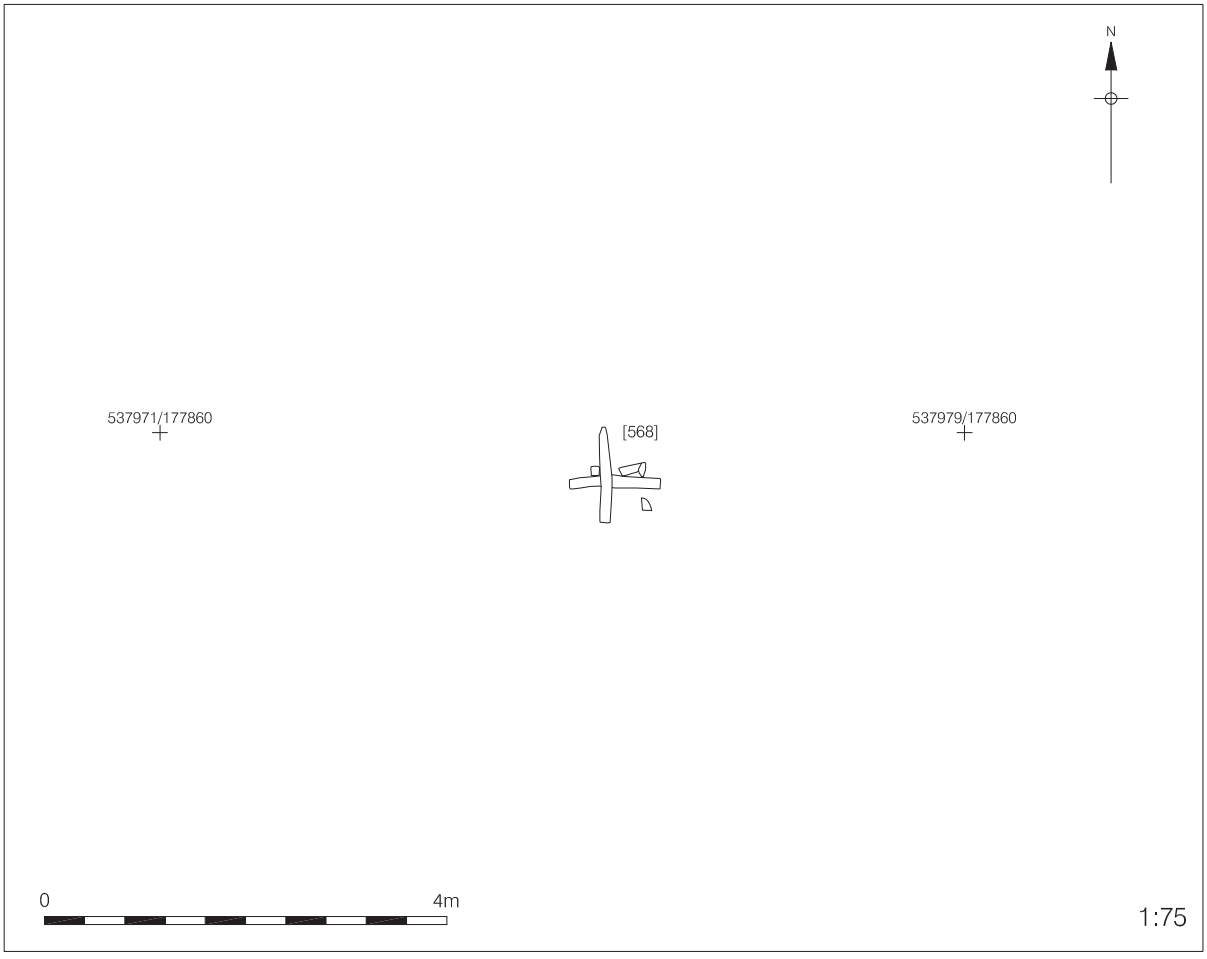

Figure 8
Phase 7a: Late 17th to Early 18th century
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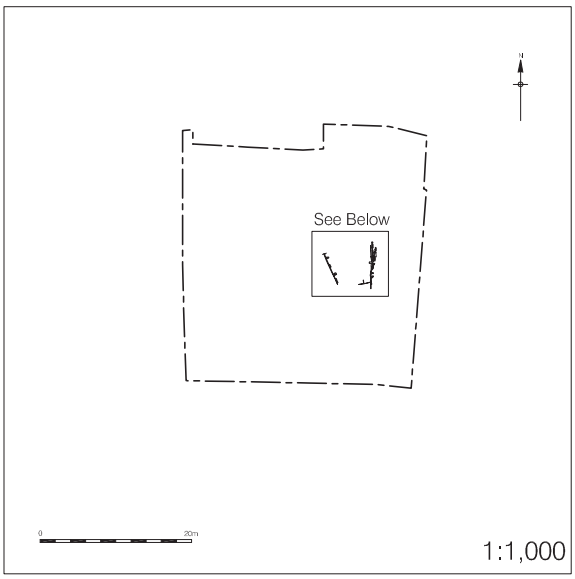

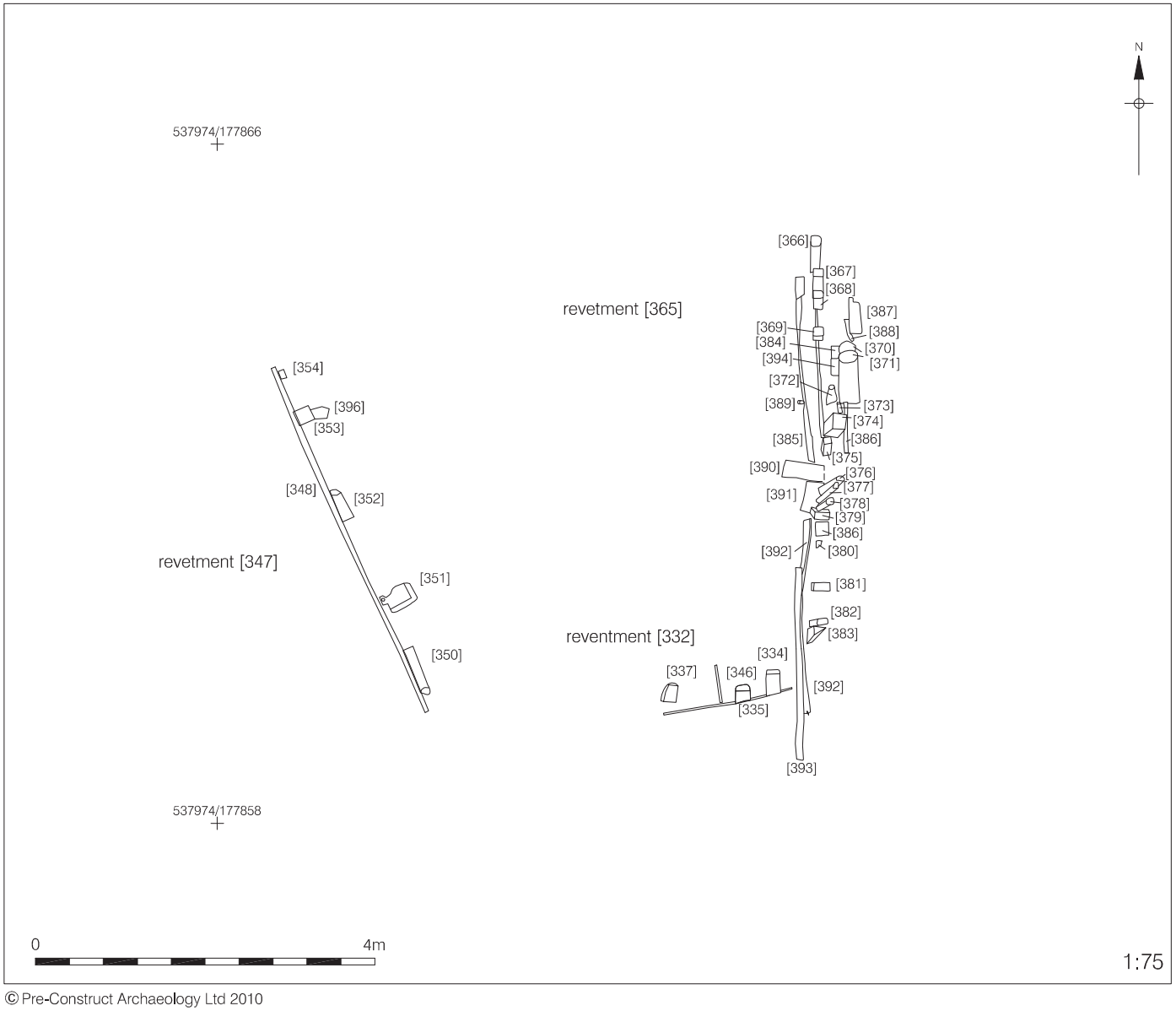

Figure 9
Phase 7b: Late 17th to Early 18th century
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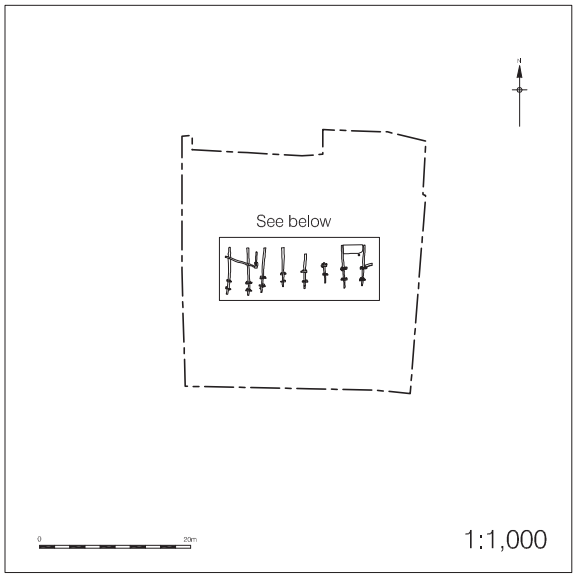

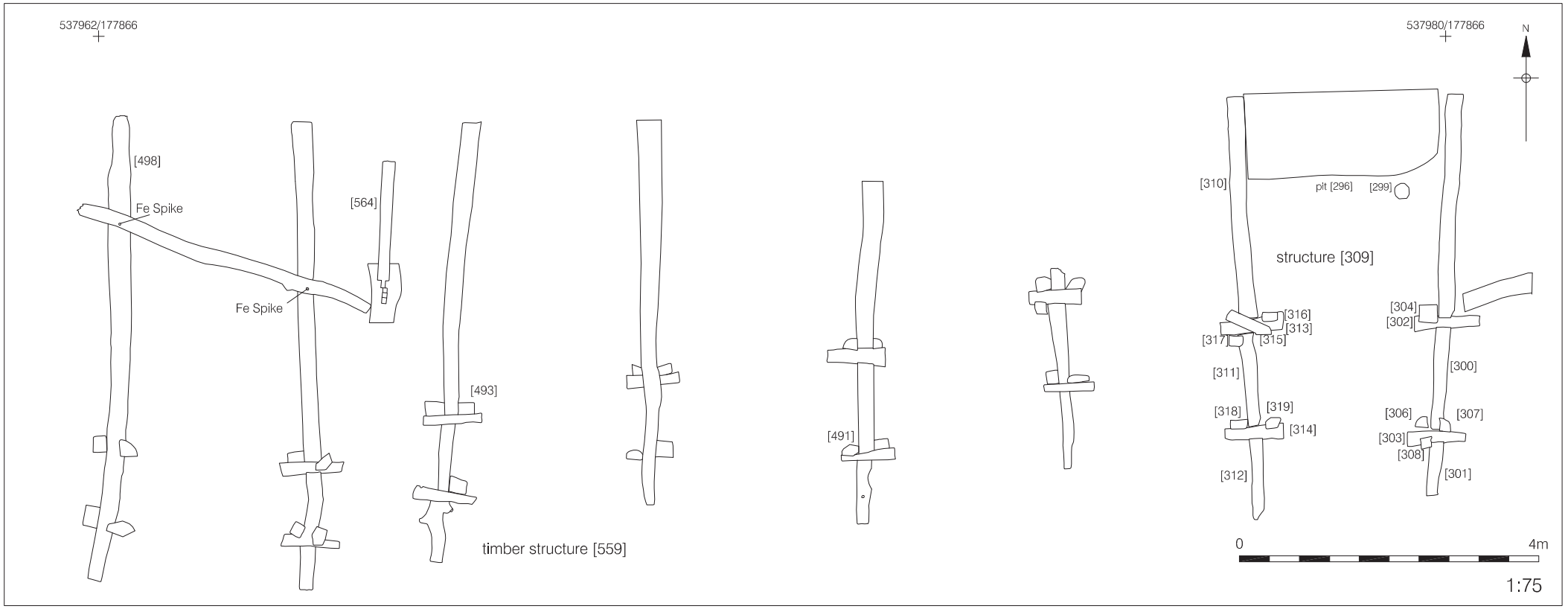

Figure 10
Phase 7c: Late 17th to Early 18th century
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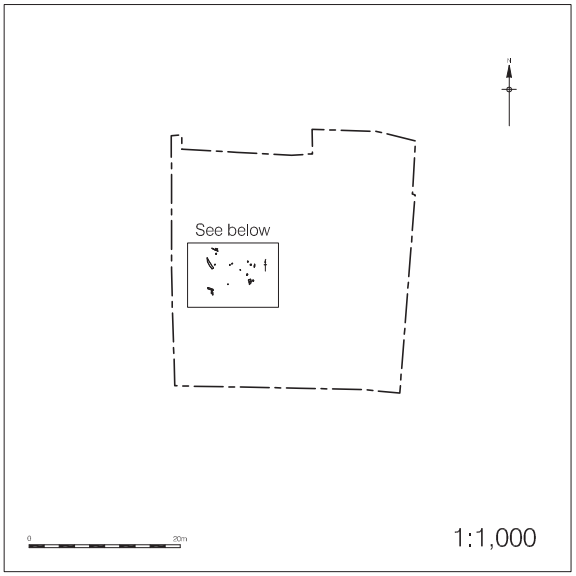

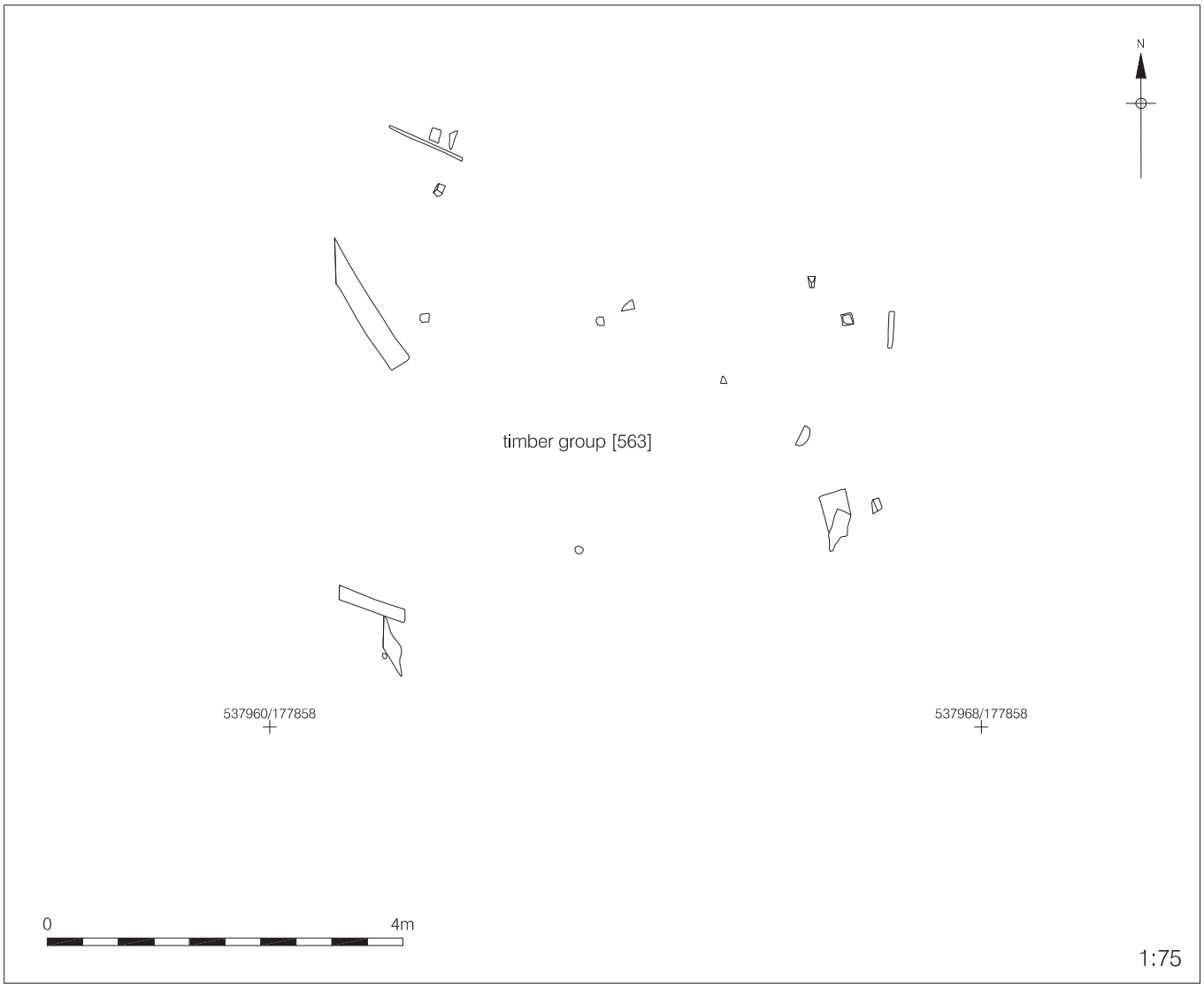

Figure 11
Phase 7d: Late 17th to Early 18th century
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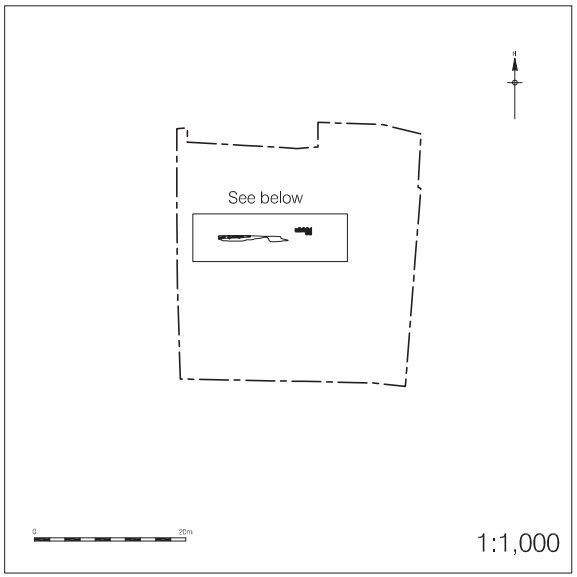

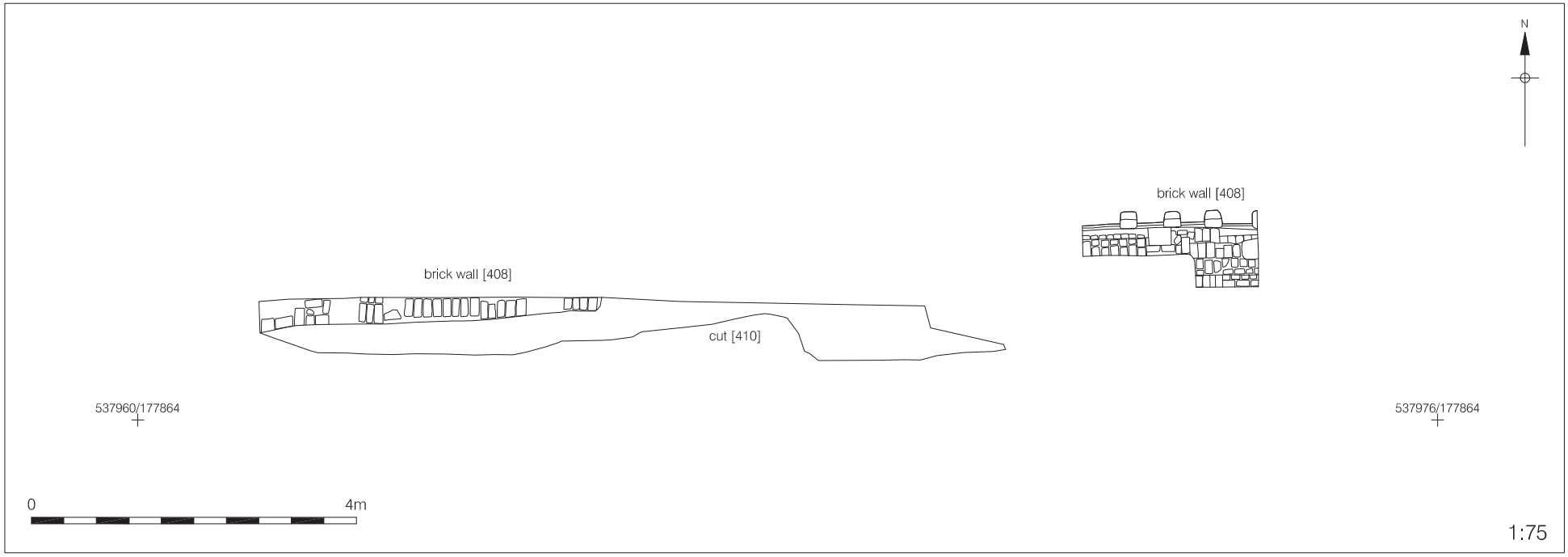

Figure 12
Phase 8: Mid to Late 18th century
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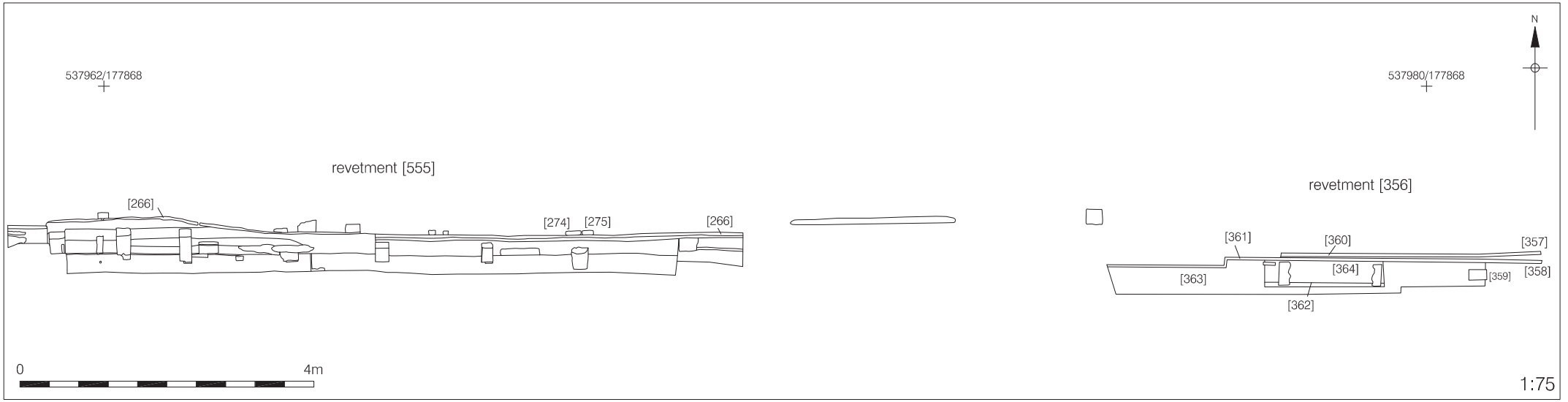


Figure 13
Phase 9: Late 18th to Early 19th century
Insert 1:1,000, Plan 1:75 at A4

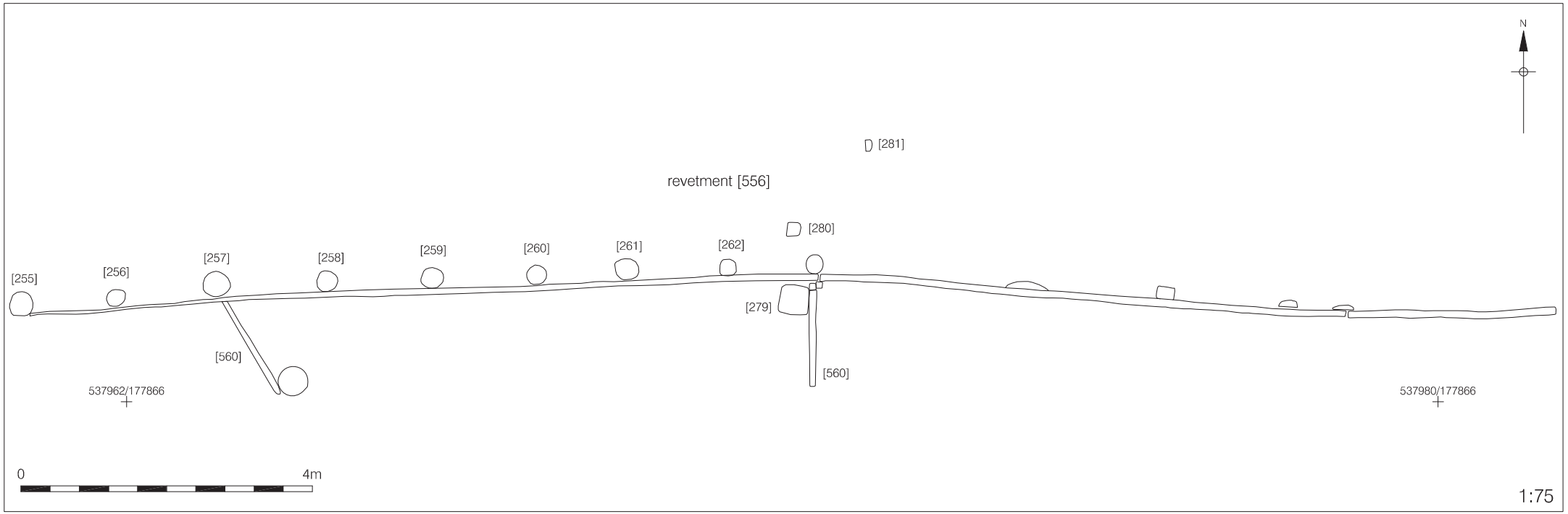
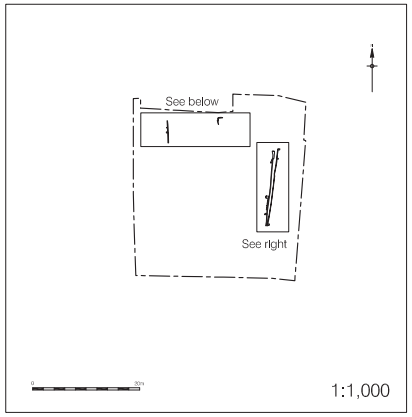
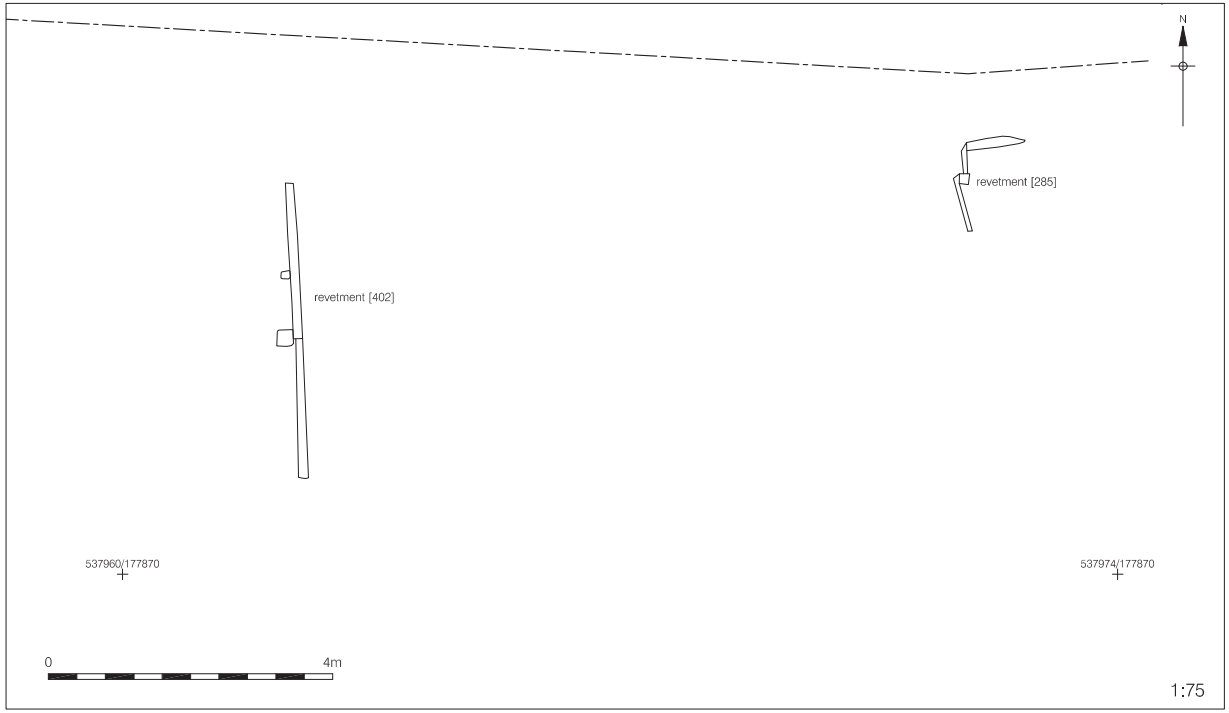


Figure 14
Phase 10: Early to Mid 19th century
Insert 1:1,000, Plan 1:75 at A4





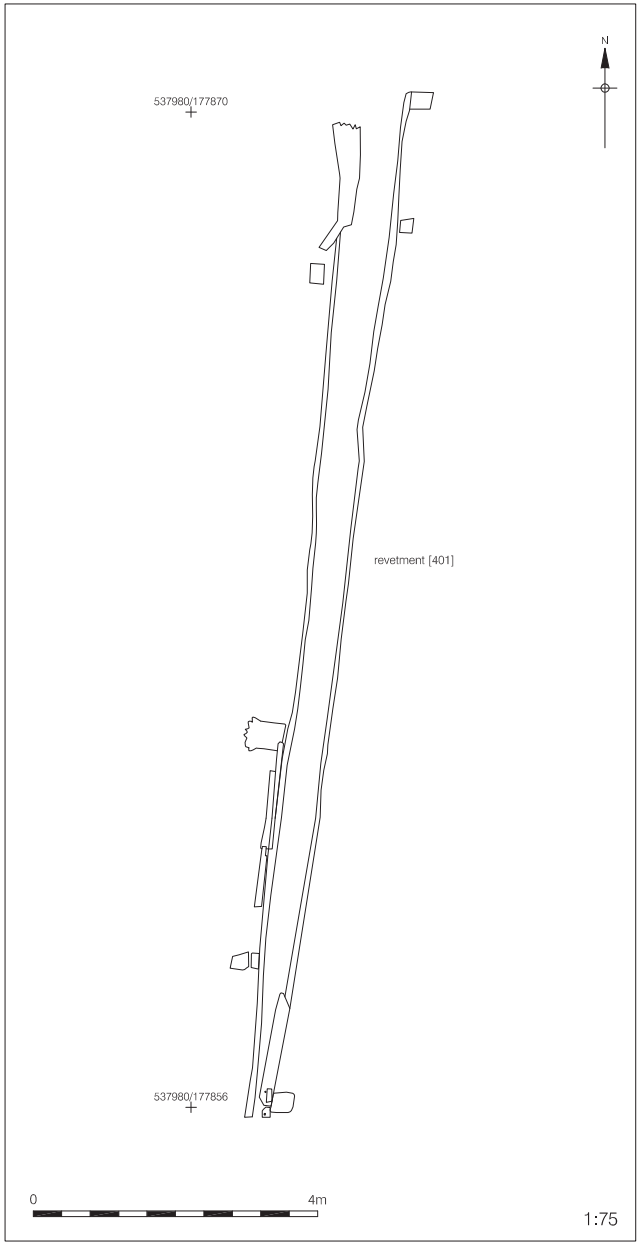


Figure 15
Phase 11: Mid to Late 19th century
Insert 1:1,000, Plans 1:75 at A3

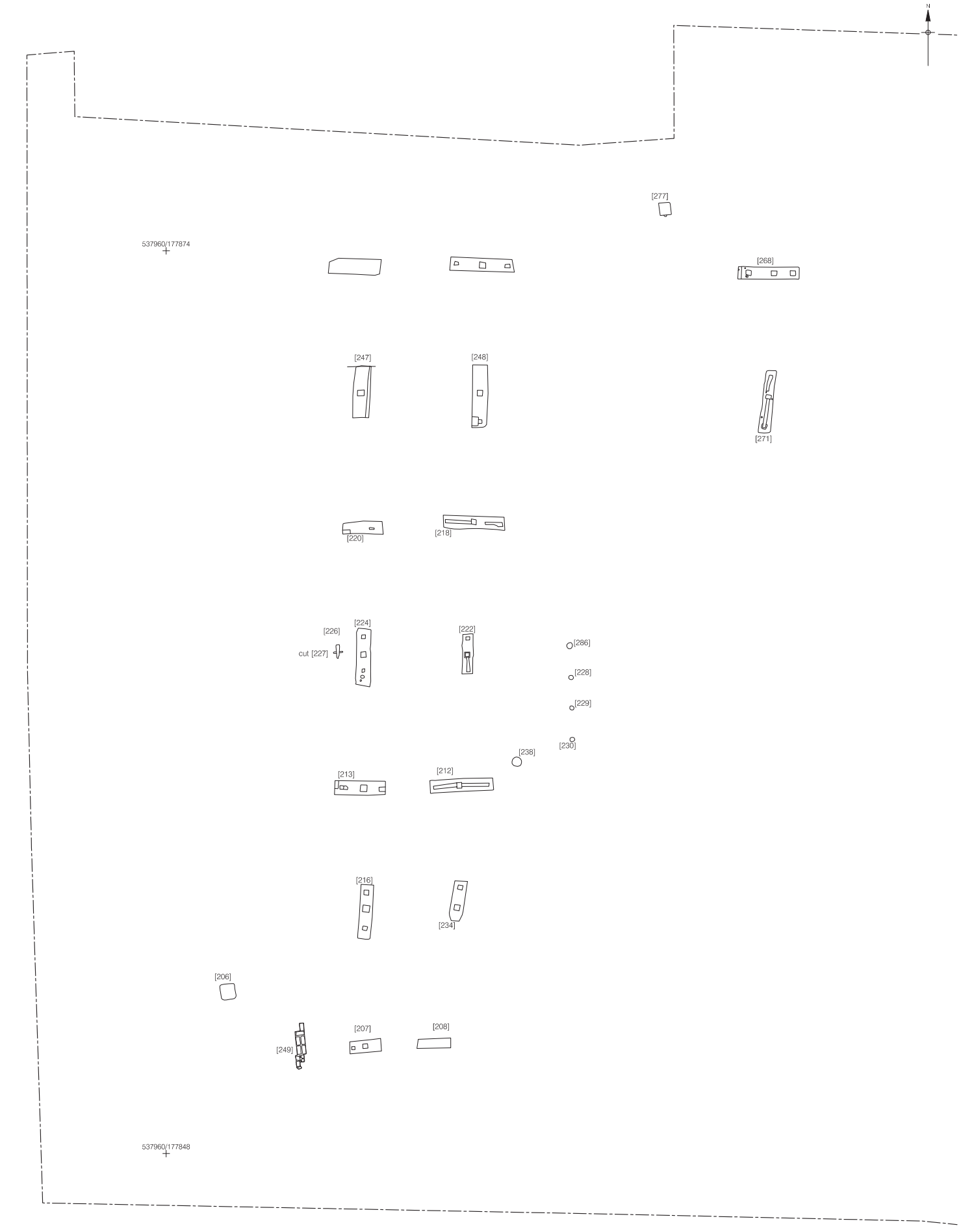


Figure 16
Phase 12: Late 19th century
1:100 at A3

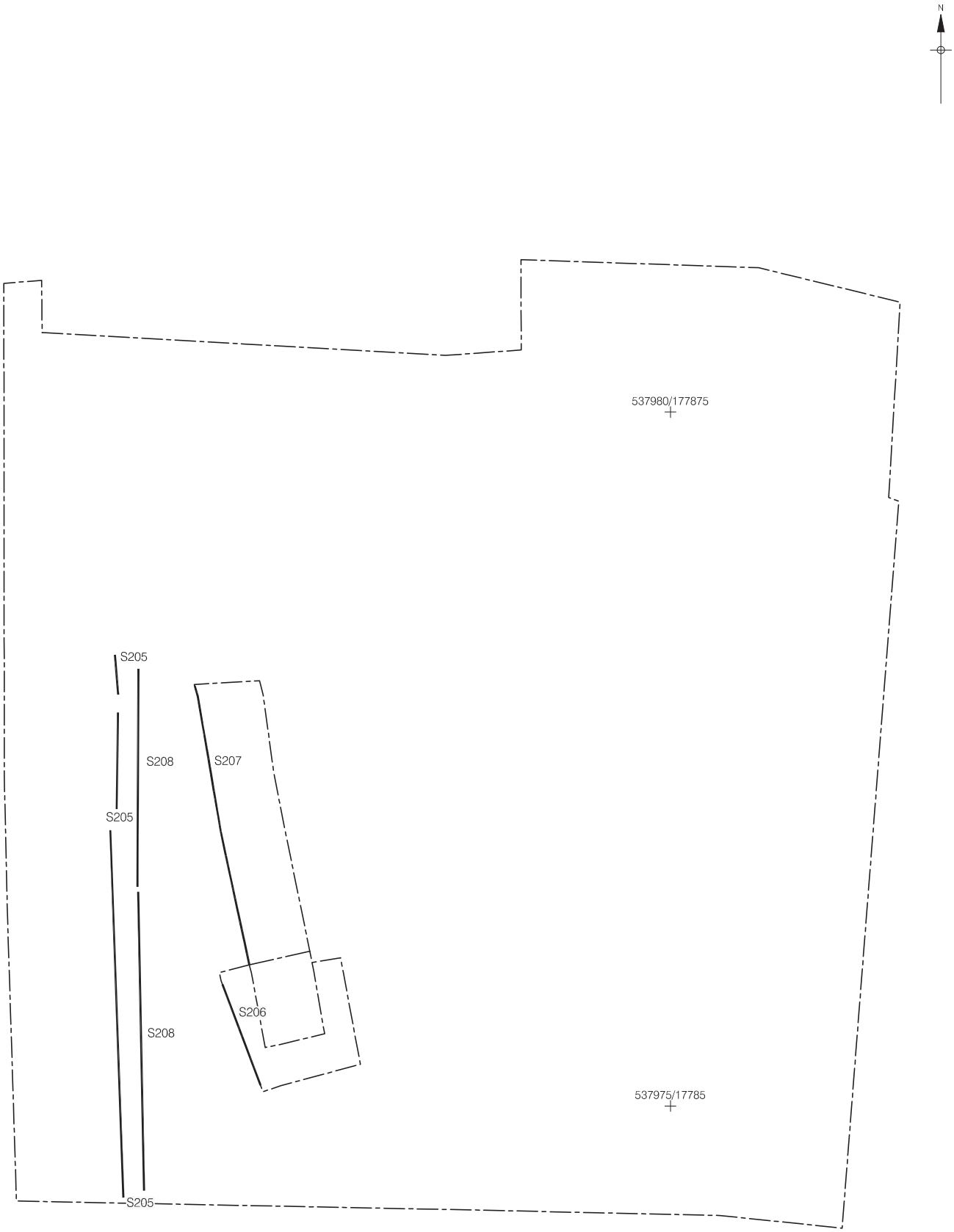
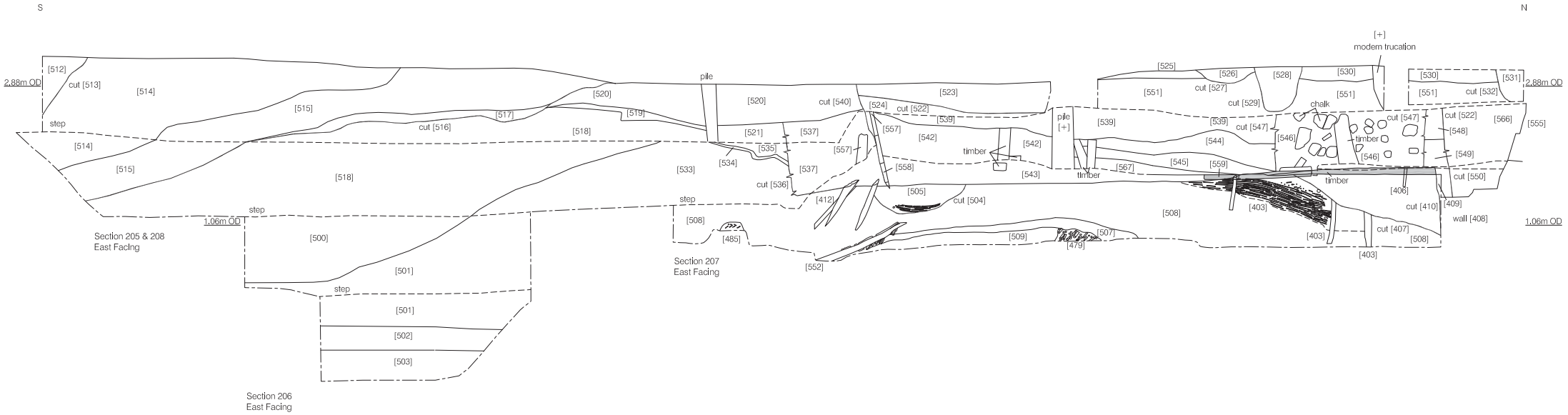


Figure 17
Section Location Plan
1:200 at A4



0 2m

Figure 18
Sections
1:50 at A3

8 ARCHAEOLOGICAL PHASE DISCUSSION

8.1 Discussion of Phase 1 – Natural Alluvium

8.1.1 Natural alluvial clay deposits were recorded within a single sondage excavated at the southern end of the excavation area. These natural alluvial clay deposits are consistent with the known underlying geology of the area; alluvial silts as described on the British Geological Survey (Sheet 270 *South London*). These deposits are also consistent with those recorded during the initial evaluation in 2006[18].

8.2 Discussion of Phase 2 – Late 15th Century to Late 16th Century

8.2.1 The first evidence of human activity on the site was represented by the installation of a clay river wall. This river wall appears to have been constructed around the beginning of the post-medieval period, sometime in the late 15th century. Recorded within this clay river wall, being integral to its construction, were a series of vertical timber wattle structures and roundwood bundles. The vertical wattle fences and hurdles defined the outer limits of the clay river wall, riverside and landside, which ran east-west across the site. The layers of roundwood bundles were used as a mat upon which the clay river wall was constructed. These bundles, or 'fascines' may have been semi-standardised fuel faggots, possibly what were termed 'bavins' (Appendix 5). The various clay deposits that formed the mass of the clay wall itself were recorded in a section which dissected the river wall. These deposits appeared to slope down to the south and may represent the landward side of the wall. Four lines of wattle fences were recorded at the same level and in close proximity to one another. These multiple fence lines may reflect the growth of the clay wall over time. It may potentially have expanded north a number of times, becoming wider each time whilst moving the river frontage slightly forward. This land winning from south to north is a general theme on the site throughout all the phases. Alternatively it might have expanded outwards both north and south from an original, smaller, clay wall. Such an expansion could have happened over a short period of time and may even have been seasonal depending on water levels. Radiocarbon dating from one line of the timber wattle fences dates to AD 1460 to 1660.

8.2.2 Recorded within the clay layers which sealed the wattle fence lines described above was a small area of collapsed timber revetment, [552]/[553]. This revetting had timber

[18] Holden, S. 2006. *An Archaeological Evaluation at Greenwich Reach, Thames Street, London Borough of Greenwich.* Pre-Construct Archaeology Ltd, unpublished report

planking nailed to both sides of the upright timbers, a feature not seen anywhere else on the site. The planks nailed to the northern side of the uprights were re-used clinker ships boards held together with iron rivets. As only a small area of this timber structure was revealed it is problematic to interpret. It appears to be a collapsed revetted river wall but as only a small area of it was recorded this cannot be determined for definite. It may be a phase of timber revetting used at the front of, or even at the rear landward side of, a phase of clay river wall to define and reinforce it. Its location in the stratigraphic sequence however places it slightly later than the four lines of wattle fence described above. It may represent part of the expanding, staged construction of the clay wall river as discussed above. Dendrochronological results from these timbers date to after AD 1549 (Appendix 6). This fits the date range from the results of the radiocarbon dating from the wattle fenceline described above, and suggest that the activity took place in the early post-medieval period.

8.3 Discussion of Phase 3 – Late 16th Century

8.3.1 Lain upon elements of the earlier phase of clay river wall described above was another phase of clay river wall and associated wattlework, [403]/[404]. A wattle fenceline was recorded representing the north extent of this new river wall; the southern limit was not encountered. It may be that the previous phase of clay river below described above was again extended and enlarged with the new frontage being represented by this wattlework. Roundwood bundles were again recorded associated with the wattle fence; this time however they were more densely packed and layered creating a more stable surface. Radiocarbon dating from the wattle structures had a date range of AD 1470 to 1660, similar to the earlier phase as discussed above. As these features were stratigraphically above the collapsed timber revetment [552]/[553] described above they must post-date them. Therefore as this collapsed revetment was dated via dendrochronolgy to after AD 1549 this phase of clay river wall must date to the later 16th century, possibly into the early 17th century.

8.3.2 Recorded in section at an equivalent height and stratigraphic position was another small area of roundwood bundles which appeared to sit within a shallow cut, [504]. These roundwood ‘fascines’ may be further evidence of a staged construction of the clay river wall over a period of time. As this feature was only recorded in section it is problematic to interpret this definitively.

8.3.3 The sequence of deposits which represented the clay wall itself was recorded by the same section described above that dissected the river wall. These deposits noticeably sloped down towards the south, mostly likely representing the landward

side of this clay river wall. The northern riverside half of the clay wall was truncated by the numerous later timber revetted river walls.

8.3.4 It is interesting to note that one of the earliest cartographic sources, Searles' Plan of the Medcalfe Estate 1777, illustrates a banked sea wall. The whole peninsular of the site on this map is labelled as 'bank sea wall'[19]. The excavation area however is encompassed by 'Wood Wharf' a boat-building workshop with associated buildings; the banked sea wall doesn't appear to continue into this area. The date of this map is substantially later however than the phases of banked sea wall recorded in the excavation area. It suggests that the banked sea wall recorded during the excavation continued in use, albeit altered and repaired, across the site until at least the late 18th century. It did not survive in the location of the excavation area as it was developed and built upon from an earlier date.

8.4 Discussion of Phase 4 – Early 17th Century

8.4.1 The next phase of activity is represented by the construction of a pile and plank revetted river wall, [412]. This replaced the clay river wall which previously existed with a more formalised timber revetment frontage. This revetment was composed of timber piles supporting horizontal on-edge timber planks. This basic construction technique was utilised throughout the majority of the many later phases of timber revetted river walls. This revetted river wall had slumped slightly towards the north probably due to pressure on the landward side. This also indicates a lack of bracing on the northern river side. The erection of this new revetted river wall, cutting into the clay river wall from the previous phase, meant that the river wall regressed to the south. This is the reverse of the general trend of the site which saw the river wall migrate predominantly from the south to the north. Dendrochronology results from one of the timber piles of this structure dated to after AD 1603. The construction of this new river wall may suggest that the previously extant clay river wall had become eroded or breached. This would have forced the installation of this new revetted river wall.

8.5 Discussion of Phase 5 – Early to Mid 17th Century

[19] Brown, J. 2005. *Historic Area Survey of Land At Greenwich Reach (Dreadnought Wharf, Victoria/Norway Wharf, Thames Street, Greenwich, London Borough of Greenwich, SE10* Pre-Construct Archaeology Ltd, unpublished report

8.5.1 The revetted river wall from the previous phase was replaced by another similar timber revetment, [558], in this phase. This new river wall migrated 0.60m north of its predecessor and was broadly similar structurally to it. The fact that its predecessor had slumped slightly forward may have prompted its replacement with this revetment. However the more robust nature of the revetted river wall in the next phase, discussed below, implies that this phase was again only short-lived. This is supported by the dating evidence; the first of these three revetted river walls [412], discussed above, provided a date of after AD 1603 via dendrochronology. The third of these phases, [557], discussed below, produced a date of after AD 1611 via dendrochronology. Despite not being precise dates they do give an indication of the date when these structures were constructed. The fact that they're close dates suggests that the first two phases at least were relatively short lived. This may have prompted a more concerted effort to construct a more robust defence with the third phase discussed below.

8.5.2 Also recorded during this phase was a single timber oak box beam [562]. This timber had mortices and rebates but was most likely re-used on the foreshore to support an upright post. It has been suggested that it may have been part of a larger structure such as an overhanging toilet or fishing platform (Appendix 5). It is unclear exactly whether it relates directly to this phase of river wall but its position in the stratigraphic sequence and general location directly north of it makes it the most plausible.

8.6 Discussion of Phase 6 – Mid to Late 17th Century

8.6.1 The next phase of activity is represented by a third, and last phase, of timber revetted river wall in the southern portion of the excavation area, [557]. This river wall only migrated another 0.50m north of the previous phase [558]. The fact that this wall moved three times over such a small distance illustrates their insubstantial nature, needed relatively frequent replacing. This third phase had heavier oak piles however, possibly to address the problem of inadequate river defences. Many of these piles were off-cuts from the making of other timbers, possibly ships frames. One of these timber piles provided a dendrochronological date of after AD 1611. This river wall, like the two previous phases, appears only to have been a defensive river wall.

8.6.2 Recorded just north of this river wall was a disturbed group of timbers, [561], possibly representing front bracing for it. These were an irregular line of sloping chocks and stakes which may originally have supported raking shores sloping upwards towards the frontage. This is further evidence of a more concerted effort to construct a stable

river wall defence due to the inadequate nature of the two previous phases of revetting discussed above.

8.7 Discussion of Phase 7 – Late 17th to Mid 18th Century

8.7.1 This phase of activity saw various changes over a relatively short period of time, something which seems to be the general theme of the site. For this reason it has been divided into four sub-phases, A to D. The first of these sub-phases is represented by a small group of timbers that appear to represent a truncated phase of land-ties, [568]. This oak beam, elm lock bar and square stakes were located north of revetted river wall [557] from the previous phase. This must mean that the river wall that it would have supported was located further to the north. Revetted river wall [557] from the previous phase must have been replaced by another considerably further north, continuing the trend of land winning from south to north. No archaeological evidence for the river wall itself was encountered, most likely being truncated by one of the various other later river walls in the area.

8.7.2 The next sub-phase of activity is represented by a small inlet or dock, [347]/[365]. This inlet or dock was formed by two lines of timber revetted walls. These however were not parallel, the eastern side was aligned north-south but the western side was aligned northnorthwest-southsoutheast. Revetted river wall [557] from the previous phase may have been used as the back end of this small inlet. The northern river wall which would have been associated with it was not recorded, again most likely being truncated by one of the many later river walls. The recorded depth of this inlet was at least 1.50m, meaning that shallow draft vessels such as small boats and barges would have been able to moor within it. It is possible that the heavily truncated land-tie assemblage [568], described above, may have been related to the same phase of river wall that this small inlet or dock relates to.

8.7.3 The third of the sub-phases is represented by another phase of timber land-ties, [559]. This time, however, they were much more substantial and encompass the majority of the excavation area. Eight timbers, aligned north-south, ran parallel to one another. Associated with these beams were timber anchor stakes and lock bars which together formed the support for a river wall. This river wall would have been located further to the north but no evidence for it survived as it must have been truncated by one of the various later walls. The northern most ends of the beams had been cleanly cut during the construction of a later river wall. Due to the substantial nature of these timber supports it is assumed that the river wall they supported would

also have been substantial. It has been suggested that the river frontage would have been relatively tall, possibly as high as 2m (Appendix 5). Recorded at the western end of the land-tie structure was another oak beam running northwest-southeast. This was fastened to two of the north-south beams with iron spikes. This suggests that this beam was supporting a corner of the frontage which would have been located outside the limits of the excavation area to the west. The corner it supported may even have been an inlet but no other evidence for such a structure was encountered within the excavation area.

8.7.4 The fourth, and final, of these sub-phases was represented by an anomalous group of timbers, [563]. This group includes an oak beam, and oak and softwood stakes and softwood planking. It is unclear what exactly these timbers relate to but they may represent the remnants of various temporary structures along the river frontage. These timbers were grouped and given their own sub-phase out of convenience and may not all relate directly to one another. However, the stratigraphic sequence illustrates them to be contemporaneous and further analysis may glean their form and function.

8.8 Discussion of Phase 8 – Mid to Late 18th Century

8.8.1 The next phase of activity on the site was yet another river wall. This time, however, it was a masonry structure, [408]. This replaced the river wall which the various timber land-ties discussed above would have supported. This brick river wall was only recorded in two distinct areas of the site but it is assumed that it would originally have been continuous through the site. The brick wall was c. 0.80m wide and had a recorded height of 1.30m but continued down below this level meaning its exact height remained unrecorded. This wall was a substantial structure and may relate to the first event of development which occurred on the site in the mid to late 18th century. On Rocque's map of 1741-1746 the area of the site is illustrated as marshland. In the latter half of the 18th century a wharf was constructed on the site. This development is reflected on the 1777 Searles' Plan of the Medcalfe Estate which illustrates that the area of the excavation trench was home to 'Wood Wharf', a boat-building workshop as well as a house and a cottage. The rest of the area of the site remained as marshland.

8.9 Discussion of Phase 9 – Late 18th to Early 19th Century

8.9.1 The next phase of activity was the construction of a new river wall, [555]/[356], reverting back to a timber structure. This timber river wall truncated the top of the brick wall [408] from the previous phase and ran on a slightly different alignment. This revetting was more elaborate than the various previous phases of timber revetment which all had a fairly common construction method. This one, however, was composed of a mortised sill beam with upright posts tenoned into it, as opposed to the timber piles used previously. Horizontal on-edge timber planking was then attached to the northern, Thames side, of the posts. A large percentage of the timbers used in this revetment were re-used second timbers, off-cuts and re-used carvel built ship and barge timbers. Of particular note amongst these were a number of re-used barge timbers used as a repair. These planks were rebated and sealed with tarred hair, most likely being re-used from the bottom of a barge (Appendix 5). This phase of river wall may relate to Greenwood's Map of 1827 which illustrates the site to be occupied by a range of buildings illustrated as a timber yard[20].

8.10 Discussion of Phase 10 – Early to Mid 19th Century

8.10.1 The next phase of activity was represented again by a slight shift of the river wall. A new revetted timber river wall, structure [556], was erected. This new river wall was installed c. 1.40m north of the elaborately constructed river wall [555]/[356] described in the previous phase above. This new wall effectively ran parallel to the old one with the space between the new and old walls backfilled. Planking aligned perpendicular to the two river walls was recorded between them possibly to be used as shuttering during the backfilling between the two. It is also possible that the old river wall was used as extra stability for the new replacement to the north via these adjoining planks. No other forms of support such as front bracing or land-ties were recorded for the river wall. This river wall appears to be only a defence; it was not designed for any ships or barges to be moored alongside.

8.10.2 The river wall recorded during this phase most likely corresponds to the river boundary illustrated on the Tithe Map of 1844. This map illustrates the site to be occupied by the gas works and shipbuilding yard to the west. In the direct location of the excavation area no buildings are extant and this area appears to be open ground. The apportionment which accompanies this Tithe map describes this plot, '282c' as a wharf garden and waste ground[21]. This lack of development is reflected in the

[20] Brown, J. 2005. *Historic Area Survey of Land At Greenwich Reach (Dreadnought Wharf, Victoria/Norway Wharf, Thames Street, Greenwich, London Borough of Greenwich, SE10* Pre-Construct Archaeology Ltd, unpublished report
[21] ibid

excavation area as only dump layers on the southern, landward side, of the river were recorded.

8.11 Discussion of Phase 11 – Mid to Late 19th Century

8.11.1 By the middle of the 19th century it appears that the river wall at Greenwich Reach has been extended a great deal further towards the north. This is represented by the cartographic evidence with the 1st edition Ordnance Survey Map of 1869 seeing considerable changes from the Tithe Map of 1844 as discussed in the previous phase above. In the easternmost extent of the site, in the location of the excavation area, the river frontage had extended further north into the Thames. This also coincided with the installation of two docks or inlets. These are clearly visible on the 1869 Ordnance Survey map; a large inlet extends into the site at the very eastern edge of the site. Just west of this a smaller inlet can be seen. These are illustrated as being Norway Wharf, associated with the shipbuilding yard also illustrated on the site.

8.11.2 Both of these dock features were recorded during the excavation. Both side of the smaller western dock/inlet, structure [402], were recorded within the excavation area. The southern limit of this was not encountered however. The larger eastern dock/inlet was represented during the excavation by its western wall and the dumped deposits within it that were used to backfill and consolidate it. The eastern side and the southern limit of the dock/inlet lay outside the excavation area. No archaeological evidence for any other structures associated with these wharves and the shipbuilding yard were recorded during the excavation.

8.12 Discussion of Phase 12 – Late 19th Century

8.12.1 The late 19th century was represented by a series timber foundations, structure [565]. The composition of these foundations was distinctive; a basal beam had an upright post tenoned into it which was supported by two diagonal braces. These trestle style foundations have been recorded twice before in Southwark[22]. In that case however they were of 18th century date. Such foundations have been interpreted as being a way of providing foundations in wet ground without the use of a pile driving rig (Appendix 5). In the excavation at Southwark mentioned above (Site code ROZ 00) the foundations had held the floor of a timber framed building above ground level.

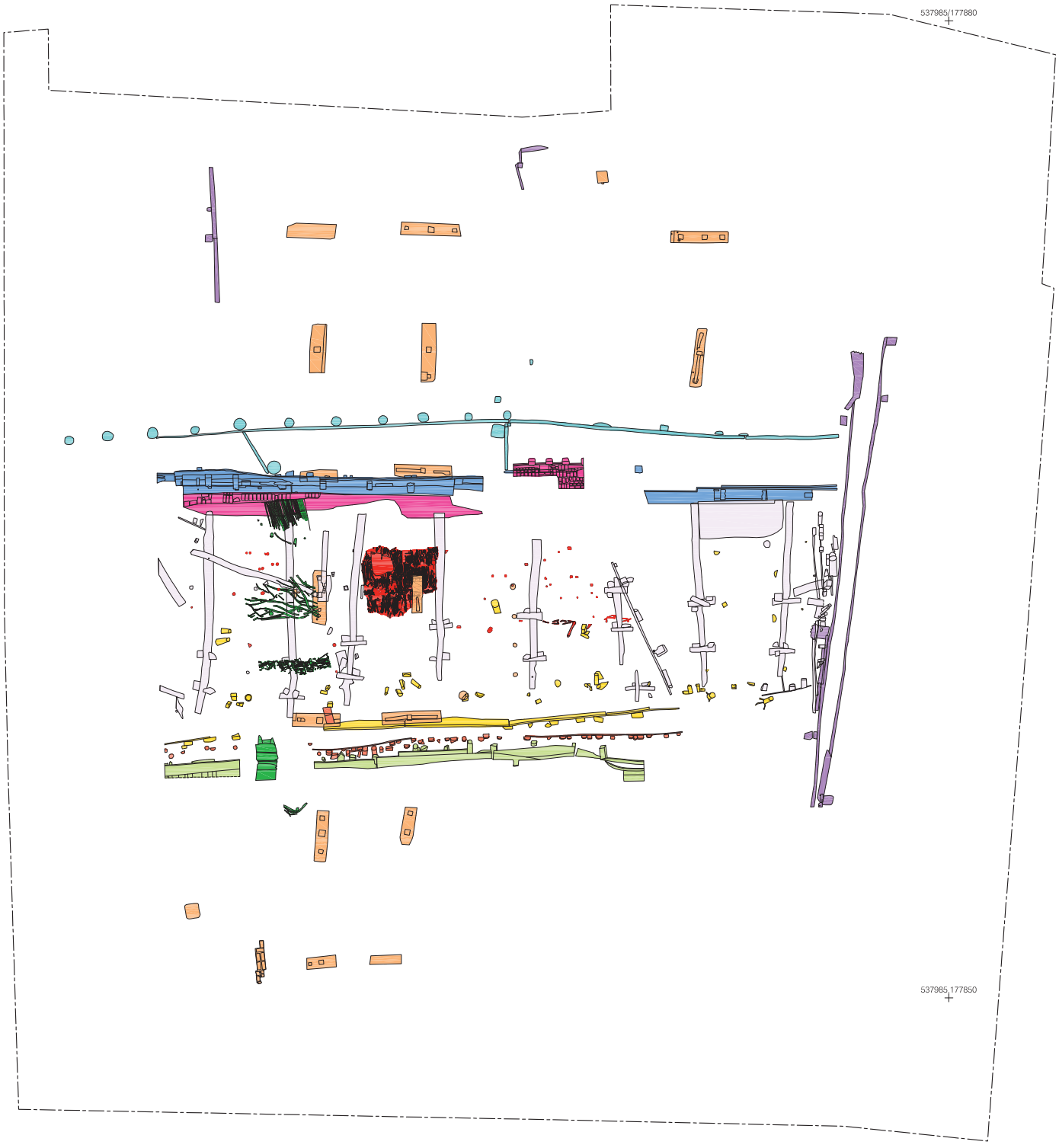
[22] Heard, K. & Goodburn, D. 2003. *Investigating the Maritime History of Rotherhithe* MoLAS Archaeology Studies Series 11.

8.12.2 The trestle foundation structure recorded at Greenwich Reach represented a phase of activity post-dating the two docks/inlets on the 1869 Ordnance Survey Map as described in Phase 11 above. These two docks were backfilled by the late 19th century to make way for subsequent development. The trestle foundations represent this development as represent by the large structure on the second edition Ordnance Survey Map of 1894-6 labelled as 'Stone Works'.

8.12.3 Identified amongst the many re-used timbers comprising trestle structure [565] were two more unusual ships timbers. The two timbers were 'floors', lower frame elements of a ship which were hewn from naturally curved crooks of softwood. These were from a foreign ship probably of North American or Scandinavian origin.

8.13 Discussion of Phase 13 – Modern

8.13.1 The late Victorian activity on site was overlain by 20th century dumps and late 20th century concrete. Within the dumped deposits disturbed remains of tracks of the travelling crane as illustrated on the 1963 and 1969 Ordnance Survey Maps were noted. The modern ground level, the late 20th century concrete, was recorded at c. 5.20m OD.



Phase 2: Late 15th to Late 16th century
Phase 3: Late 16th century
Phase 4: Early 17th century
Phase 5: Early to Mid 17th century
Phase 6: Mid to Late 17th century
Phase 7: Late 17th to Early 18th century
Phase 8: Mid to Late 18th century
Phase 9: Late 18th century to Early 19th century
Phase 10: Early to Mid 19th century
Phase 11: Mid to Late 19th century
Phase 12: Late 19th century

0 5m

Figure 19
All Features
1:125 at A3

9 ORIGINAL AND REVISED RESEARCH OBJECTIVES

9.1 Research Objectives

9.1.1 A number of research objectives were outlined following the results of the archaeological evaluation undertaken in 2006. These are set out in the method statement for the archaeological excavation phase centred on evaluation Trench 3[23]. These are addressed below.

- **Further enhance our understanding of the natural topography of the site. How does it fit in with evidence from other investigations on the site to develop a topographic model for the area?**

  The archaeological excavation recorded little information regarding the topography of the site. Natural alluvial clay layers were recorded in one specific location of the excavation area within a deeper sondage. These results can be cross-correlated and added to the known data but would only yield minimal additional information regarding the natural topography of the site.

  The boreholes undertaken during the archaeological evaluation in 2006 combined with previous boreholes monitored in 1997 and the other watching brief phases has the potential to further enhance the understanding of the natural topography. These have the potential to extrapolate a topographic model from their results. However the information gleaned from the excavation area would only provide limited additional information to this model.

- **What evidence is there for prehistoric occupation/exploitation of the area?**

  No evidence for prehistoric occupation or activity was encountered within the excavation phase. No archaeological remains pre-dating the late medieval/early post-medieval period were recorded.

- **What evidence is there for historic occupation and/or exploitation of the area?**

[23] Bradley, T. 2008. *Method Statement for an Archaeological Excavation of Land at Greenwich Reach, Thames Street, London Borough of Greenwich.* Pre-Construct Archaeology Ltd, unpublished report

The earliest recorded activity on the site dated to the late 15th century, the early post-medieval period. This took the form of a defensive clay river wall with associated wattle fences. No direct evidence for earlier activity was recorded. It is not unreasonable to assume however that such defensive river walls were not already in use before the early post-medieval phase which was recorded in the excavation area. Chalk foundations possibly dating to the late medieval period were however recorded during the watching brief in 2005[24]. However, as no definitive evidence of occupation or exploitation in the area was recorded, either during the evaluation in 2006 or the subsequent excavation, activity pre-dating the late 15th century cannot be accurately determined.

- **What evidence is there for post-medieval occupation of the area? Does the timber revetment previously located in Trench 3 relate to any of the three wharfs, Dreadnought, Victoria and Norway, known to be located in this area of the site?**

The archaeological excavation encountered abundant evidence for occupation of the area during the post-medieval period. This was predominantly represented by a number of phases of defensive river wall and other associated features. The earliest recorded activity dated to the very beginning of the post-medieval period, the late 15th century. This took the form of an extensive defensive clay river wall with associated wattle fencelines. This defensive bank developed in stages, expanding outwards becoming larger. A second phase of clay river wall replaced the initial one in the early 16th century. This was then replaced by three distinct phases of timber pile and plank revetted river walls. The common trend of the site seems to be the continual changing and rebuilding of the river wall over a relatively short period of time. The next sequence of activity is more disturbed and fragmentary with a number of timber features being recorded which were associated with rivers walls that would have been located further north but were completely truncated. These include two phases of timber land-ties which would have supported a river wall to the north and the remnants of a small dock or inlet also associated with a river wall to the north. This small dock or inlet appeared to be in use between the late 17th to the early 18th century.

[24] Mattinson, R. 2005 *An Archaeological Watching Brief on Works to the River Walls at Greenwich Reach, Thames Street, Greenwich, SE10* Pre-Construct Archaeology unpublished report

Cartographic sources indicate the area of the site to be marshland until the late 17th century. The 1777 Searles' Plan of the Medcalfe Estate illustrates that the area of the excavation trench was home to 'Wood Wharf', a boat-building workshop as well as a house and a cottage. A substantial brick wall was recorded on the site dating to this period and may represent the river frontage at this time. This brick wall was replaced in the late 18th to early 19th century by a timber revetted river wall which was in turn replaced by a second phase 19th century river wall. These two timber revetted river walls most likely correspond to the river frontages represented on Greenwoods Map of 1827 and the Tithe Map of 1844 respectively. By the first edition Ordnance Survey Map of 1869 the river frontage had been extended northwards and two inlet/docks were located on the site, part of Norway Wharf. Both these dock structures were recorded within the excavation area. By the second edition Ordnance Survey Map of 1894-6 these two docks associated with Norway Wharf had been decommissioned and backfilled. Constructed upon these backfilled docks were large industrial buildings, labelled as 'stone works'. The last phase of pre-modern activity recorded during the excavation related to these late 19th century buildings. These were represented by a number of timber trestle foundations associated with the stone works.

9.2 Further Research Questions

9.2.1 The excavation work undertaken raises further research questions.

- Can the overall dimensions of the clay banked river walls be extrapolated?
- How does the clay banked river wall found on site compare with similar features other sites such as Bermondsey Wall West[25], Deptford[26] and Adlards Wharf[27]?
- Can an accurate staged construction and rebuilding of the clay banked river walls be discerned using the various wattle fencelines?
- Can the various river walls and defences provide information regarding the rise and fall of water levels?

[25] Brown, G. & Taylor, J. forthcoming. Medieval embankment and post-medieval development at Bermondsey Wall West, *Surrey Archaeological Collections.*
[26] Divers, D. 2004. 'Excavations at Deptford on the site of the East India Company dockyards and the Trinity House almshouses, London', *Post-Medieval Archaeology* 38/1, 17-132.
[27] Divers, D, 2002. The post-medieval waterfront at Adlards Wharf, Bermondsey, London, *Post Medieval Archaeology*, 36, 39-117.

- Can the timber recorded on site provide information about local industry and trade and in particular the shipping industry?

- Can the timber recorded on site provide information about use of woodland resources?

- Can the dimensions of the truncated river walls be extrapolated from the size of the timber land-ties which supported them?

- Can the various later timber revetted river walls be aligned with the corresponding cartographic evidence such as the Ordnance Survey Maps and earlier maps such as Greenwoods Map of 1827?

- How does the maintenance of the riverfront compare on the west side of Deptford Creek?

- Can river wall construction on the east side of Deptford Creek be linked to similar activity on the west side?

- Can any of the river walls be linked to documented construction activity or as a response to documented natural occurrences such as major inundations and breaches of the river defences?

10 IMPORTANCE OF THE RESULTS, PROPOSALS FOR FURTHER WORK AND PUBLICATION OUTLINE

10.1 Importance of the Results

10.1.1 The site at Greenwich Reach has provided significant information regarding the river defences from the late medieval to the late 19th century along the Thames to the east of historic settlements at the City and Southwark.

10.1.2 The two phases of 'mudwall' river defence of the late medieval to 16th century is of regional importance and provides a window on the river defences before the urban growth of the later post-medieval period. The constructional techniques employed in the 'mudwall' embankment adds to our knowledge of a poorly understood feature which has only recently been revealed on other sites to the west (at Deptford[28]) and east (at Bermondsey Wall West[29]) of the present site.

10.1.3 Numerous phases of later river defences mainly constructed from timber, but with one of masonry, were revealed dating from the late 16th to 19th centuries. These revealed that the maintenance of the riverfront defences was a continual process with many of the river walls lasting only a few years. The constant rebuilding was both a response to a series of well documented floods but also to upgrade the river front as river traffic and trade increased leading to a need to cater for an increase in the number and size of vessels. The changing requirements of the waterfront are also revealed by the revetted docks and inlets.

10.1.4 The sequence of timber river walls and dock inlets is of regional and local interest as the site occupies a core area of maritime industrial development with both the Royal Dockyards and the East India Company Dockyards located immediately to the west of Deptford Creek. The results of the present archaeological investigation on the east side of the Creek complement those on the Stowage site in Deptford[30] on the west side and will allow them to be compared and contrasted.

[28] Divers, D. 2004. 'Excavations at Deptford on the site of the East India Company dockyards and the Trinity House almshouses, London', *Post-Medieval Archaeology* 38/1, 17-132.
[29] Brown, G. & Taylor, J. forthcoming. Medieval embankment and post-medieval development at Bermondsey Wall West, *Surrey Archaeological Collections.*
[30] Divers, D. 2004. 'Excavations at Deptford on the site of the East India Company dockyards and the Trinity House almshouses, London', *Post-Medieval Archaeology* 38/1, 17-132.

10.1.5 The constructional techniques employed on the various riverfronts are of significance and their use of reused ships timbers also allows a picture of shipbuilding techniques from the 16th century onwards to emerge.

10.2 Further Work

10.2.1 Further analysis of the dendrochronological and other dating of the various river walls will attempt to refine the dating of the various revetments. A study of the documentary sources will attempt to link the various phases of rebuilding to documented natural occurrences such as breaches of the river defences and periods of great inundations together with recorded building initiative along the riverfront.

10.2.2 The results of the present investigation will be compared with other mudwalls found along the Thames estuary at such sites as the Stowage site[31], Deptford, Adlards Wharf[32] and Bermondsey Wall West[33]. The later river walls will also be compared and contrasted with the evidence of other river defences along the Thames, especially those at the Stowage, Deptford and Rotherhithe[34] but of course acknowledging the large corpus of information from the City and Southwark.

10.2.3 The timber constructional techniques will be further analysed by the Historic Timber Specialist (Damian Goodburn) and will be compared to the results of other sites. The reused ship's timbers will also be subject to similar further analysis.

10.3 Publication Outline

10.3.1 It is anticipated that the results of the archaeological investigations conducted at Greenwich Reach will be published as part of the 'Surrey Archaeological Collections' journal series. The sequence of river defences together with the revetted dockyards and inlets will be the main focus of the publication. The publication will attempt to place the river defences within a documentary context and compare and contrast the results with other neighbouring sites.

[31] Divers, D. 2004. 'Excavations at Deptford on the site of the East India Company dockyards and the Trinity House almshouses, London', *Post-Medieval Archaeology* 38/1, 17-132.
[32] Divers, D, 2002. The post-medieval waterfront at Adlards Wharf, Bermondsey, London, *Post Medieval Archaeology*, 36, 39-117
[33] Brown, G. & Taylor, J. forthcoming. Medieval embankment and post-medieval development at Bermondsey Wall West, *Surrey Archaeological Collections.*
[34] Heard, K. & Goodburn, D. 2003. *Investigating the Maritime History of Rotherhithe* MoLAS Archaeology Studies Series 11.

10.3.2 The publication will also incorporate the results of a neighbouring site at 43-81 Greenwich High Road, which revealed part of Greenwich's industrial heritage in the form of late post-medieval tanning pits. The results of this archaeological investigation are presented in Appendix 11 of the present report.

10.3.3 A brief outline of the publication as it may appear is shown below.

Archaeological Investigations at Greenwich Reach & Greenwich High Road

Contributors

Contents

Summary

Preface

Greenwich Reach

Introduction

Circumstances of the Investigations

Geology and Topography

The excavation

Natural deposits

The Mudwall embankment

The late 16th century to 19th century river defences and revetted docks and inlets

Late 19th century buildings

The specialist reports

Post Roman Pottery	(Chris Jarrett)
Clay Tobacco Pipe	(Chris Jarrett)
Bone	(Kevin Rielly)
Wood	(Damian Goodburn)

Illustrations

The report will be fully illustrated with AutoCAD phased figures, historic maps and drawings of the most important finds especially the historic timberwork.

Discussion

The results of the archaeological investigation will be put in a local context and be compared and contrasted with neighbouring sites in Deptford and Rotherhithe.

Greenwich High Road

The results of the archaeological investigations at this site will be briefly described and the local tanning industry will be discussed and compared with the major centre at Bermondsey

Acknowledgements

Bibliography

11 CONTENTS OF THE ARCHIVE

11.1 PAPER RECORDS

Context Sheets	339 sheets
Plans	175 sheets
Timber drawings	2 sheets
Sections	10 (33 sheets)

11.2 THE FINDS

Pottery	11 boxes
Animal Bone	5 boxes
Ceramic Building Material	2 crates & 2 boxes
Clay Tobacco Pipe	1 box
Glass	1 box
Leather	6 bags
Timber	35 samples

11.3 PHOTOGRAPHS

35mm Colour Slide	190 shots
35mm Black & White Prints	192 shots
Colour Medium Format	9 shots
Black & White Medium Format	9 shots
Digital	160 shots

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13 ACKNOWLEDGMENTS

13.1 Pre-Construct Archaeology Ltd would like to thank Duncan Hawkins of CgMs Consulting for commissioning the work.

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13.5 A special thank you must go to Stuart Holden, who undertook the evaluation in 2006 and began the excavation whilst the author was busy elsewhere. A final thank you must go to the site staff, without whose hard work the site couldn't have been completed: Patrick Cavanagh, Tristan Adfield, Phil Frickers, Tomasz Mazurkiewicz, Will Johnston, Sophie White, Mike Bazley, Chris Rees, Iain Bright, James Langthorne, Sarah Barrowman, Guy Seddon, Ireneo Grosso and Malgorzata Trelka

APPENDIX 1: POTTERY REPORT

Chris Jarrett

INTRODUCTION

A small sized assemblage of pottery was recovered from the site (11 boxes). The pottery dates the post-medieval period, but particularly the 17th to 19th centuries. Very few sherds show evidence for abrasion and were probably deposited fairly rapidly after breakage. Pottery production wasters are also noted amongst the assemblage. The fragmentation of the pottery ranges from sherd material to identifiable forms and a number of vessels have a complete profile. Pottery was recovered from 35 contexts and individual deposits produced small to mixed groups of pottery (under 30 sherds or up 100 sherds).

All the pottery (361 sherds and none are unstratified) was examined macroscopically and microscopically using a binocular microscope (x20), and recorded in an ACCESS 20007 database, by fabric, form, decoration, sherd count and estimated number of vessels (ENV's). The classification of the pottery types is according to the Museum of London Archaeological Service. The pottery is discussed by types and its distribution

THE POTTERY TYPES

Chronologically all the pottery from the site can be dated to the post-medieval period.

Local red earthenwares
London-area post-medieval redware (PMR), 1580-1900, 272 sherds, forms: bowl; flared (deep, medium), rounded (handled), bowl or dish, chamber port, dripping dish (handled), distillation flask, flower pot, jar; bung-hole, rounded (tall, medium, small, handled), jug; rounded, pipkin, pipkin/cauldron, strainer, syrup collecting jar, sugar cone mould and tripod pipkin.

The majority of the post-medieval redware is probably refuse material from the local Deptford and Greenwich potteries, but only 22 sherds show actual evidence for being wasters, mostly as glaze that has run over breaks, but smaller incidences of surface spalling and over-fired glazes were also noted. A large quantity of the post-medieval redware consists of sugar cone moulds (68 sherds, 65 MNV's) and syrup collecting jars (45 sherds, 32 ENV's), but there are also smaller amounts of distillation flasks (three sherds from the same number of vessels). Such forms were noted amongst the PMR wasters recovered from backfills behind the waterfront revetments on the nearby Stowage site: SOA96 (Jarrett 2004). The sugar refining wares recovered from context [393] were also noted for being water worn.

London-area early post-medieval redware (PMRE), 1480-1600, one sherd, form: jar.
London-area post-medieval redware with organic content (PMRO), 1480-1700, one sherd, form: unidentified but possibly an industrial vessel.
London-area post-medieval slipped redware with green glaze (PMSRG), 1480-1650, two sherds, form: bowl or dish.
London-area post-medieval slipped redware with clear (yellow) glaze (PMSRY), 1480-1650, three sherds, forms: bowl or dish, dish: type 2 carinated.
Surrey-Hampshire border redware (RBOR), 1550-1900, four sherds, form: jar; rounded, lid.

English tin-glazed ware
English tin-glazed ware (TGW), 1570-1846, four sherds, forms: dish: small, plate.
Tin-glazed ware with plain pale-blue glaze (TGW BLUE), 1630-1846, one sherd, forms: ointment pot.

Industrial finewares
Creamware with developed pale glaze (CREA DEV), 1760-1830, 21 sherds, forms: bowl; rounded, jug, plate; dinner, rectangular.
Pearl ware (PEAR), 1770-1840, eight sherds, form: plate; dinner.
Pearl ware with under-glaze blue painted decoration (PEAR BW), 1770-1820, one sherd, form: plate.
Pearl ware with under-glaze painted decoration (PEAR PNTD), 1770-1840, one sherd, form: saucer.
Plain refined white earthenware (REFW), 1805-1900, six sherds, forms: jar; cylindrical, lid, plate.
Transfer-printed refined whiteware (TPW), 1780-1900, thirteen sherds, forms: bowl; carinated (small), plate: tea, water closet.
Transfer-printed refined whiteware with 'flow blue' decoration (TPW FLOW), 1830-1900, 42 sherds, forms: bowl, jug; octagonal, saucer, teacup.
Brown or black transfer-printed refined whiteware (type 3) (TPW3), 1810-1900, one sherd, form: bowl.
Transfer-printed refined whiteware with under-glaze printed and over-glaze painted decoration (type 6) (TPW6), 1840-1900, one sherd, form: unidentified.

Imported wares

German
Frechen stoneware (FREC), 1550-1700, two sherds, forms: jug; bartmann.
Westerwald stoneware (WEST), 1590-1900, one sherd, form: bottle (seltzer).
.
French

Martincamp-type ware type III flask (red earthenware) (MART3), 1600-1650, two sherds,

Portugal

Portuguese micaceous coarse earthenware (POCO), 1600-1800, one sherd, form: lid.

Unidentified

A single sherd of a sandy white fabric with an external tin-glaze is possibly in the form of a jug. It is decorated with vertical blue, purple and yellow lines. It most closely resembles Italian Montelupo tin-glazed ware dated 1500-1700.

Non-local wares

Agate ware? (AGAT), 1730-1780, three sherds, form: bowl. This ware is atypical of the fabric and consists of predominately a white clay with red clay marbling and has a coarse clear glaze appearing yellow. It may possibly represent a by product of the local redware industry.
Combed slipware (STSL), 1660-1870, one sherd, form: dish; rounded.
Sunderland-type coarseware (SUND), 1800-1900, two sherds, form: unidentified.
Plain yellow ware (YELL), 1820-1900, one sherd, form: dish; oval.
Yellow ware with industrial slip decoration (YELL SLIP), 1820-1900, two sherds, form: unidentified.

English Stonewares

English stoneware (ENGS), 1700-1900, 28 sherds, form: bottle; blacking.
Dipped white salt-glazed stoneware (SWSL), 1710-1760, one sherd, form: bowl; rounded (small).
London stoneware (LONS), 1670-1926, one sherd: form: unidentified
White salt-glazed stoneware (SWSG), 1720-1780, two sherds, form: lid: mustard pot.

Unidentified

A single shoulder sherd of jug with a handle scar is in a buff fabric with quartz, iron-ores and mica. It is decorated with white-slip arcs and appears to be part of the Kent-Sussex late medieval/early post-medieval white painted tradition.

DISTRIBUTION

Table 1 shows the contexts containing pottery, the number of sherds, the pottery types in the deposit and a spot date for the group. Pottery occurs in phases 2-12. Most contexts only contained post-medieval redware which has a very long period of production; therefore the spot date for such contexts takes into account typological differences in form and decoration (Jarrett 2004).

Context	Phase	SC	Date range of pottery types	Latest dated pottery type	Pottery types	Spot date
17		2	1580-1900	1580-1900	PMR	1580-1900
20		2	1580-1900	1580-1900	PMR	1580-1760
37		2	1580-1900	1580-1900	PMR	1580-1900
56		2	1580-1900	1780-1900	PMR, TPW	1780-1900
63		1	1580-1900	1580-1900	PMR	1580-1900
64		3	1580-1900	1580-1900	PMR	1650-1900
68		3	1580-1900	1580-1900	PMR	1580-1900
78		1	1580-1900	1580-1900	PMR	1580-1900
81		2	1550-1900	1720-1900	RBOR, SWSG	1720-1780
82		1	1580-1900	1580-1900	PMR	1580-1900
103		2	1580-1900	1660-1900	PMR, STSL	1660-1900
104		2	1760-1830	1760-1830	CREA DEV	1760-1830
108		30	1580-19000	1840-1900	CREA DEV, PEAR, PEAR TR, PMR, TPW 6,	1805-1830
109		3	1550-1900	1760-1900	CREA DEV, RBOR	1760-1830
204	12	8	1580-1900	1580-1900	PMR (WST)	1650-1730
205	12	7	1480-1900	1780-1900	PMR, POCO, TPW	1780-1900
239	12	3	1580-1900	1580-1900	PMR (WST)	1580-1730
287	7c	9	1570-1900	1580-1900	PMR, TGW	1580-1730
288	7c	31	1580-1900	1580-1900	PMR	1650-1730
290	7c	8	1480-1900	1580-1900	PMRE, PMR (WST)	1650-1730
294	7b	31	1480-1900	1580-1900	?MLTG, PMR (WST), PMRO, PMSRG, PMSRY, INDET	1650-1730
295	7c	30	1580-1900	1580-1900	PMR (WST),	1650-1730
297	7b	28	1580-1900	1580-1900	PMR (WST)	1650-1730
327	7b	7	1580-1900	1580-1900	PMR	1580-1700

Context	Phase	SC	Date range of pottery types	Latest dated pottery type	Pottery types	Spot date
329	7b	8	1580-1900	1580-1900	PMR (WST)	1580-1700
331	7b	4	1580-1900	1580-1900	PMR	1580-1900
335	6	1	1580-1900	1580-1900	PMR	1580-1900
355	7b	77	1480-1900	1820-1900	?AGAT, FREC, MART3, PMR (WST), TGW, YELL	1820-1900
397	10	4	1570-1900	1780-1900	PMR, TGW, TPW	M-L 19TH C
398	10	9	1720-1900	1820-1900	REFW, SUND, TPW, YELL SLIP	1820-1900
399	10	31	1550-1926	1820-1926	ENGS, LONS, PEAR BW, PMR, RBOR, REFW, TGW BLUE, TPW, TPW3, WEST, YELL SLIP	M-L 19TH C
478	2	1	1580-1900	1580-1900	PMR	1580-1900
505	3	3	1580-1900	1580-1900	PMR	1650-1900
515	7c	2	1580-1900	1580-1900	PMR	1650-1900
517	7c	3	1580-1900	1580-1900	PMR	1580-1900

Table 1. GQR06: Distribution of pottery types showing individual contexts containing pottery, what phase the context occurs in, the number of sherds, the date range of the latest pottery type, the fabrics present and a suggested deposition date. SC: sherd count, WST: waster.

SIGNIFICANCE OF THE COLLECTION

The pottery has some significance at a local level as it reflects local industrial activity and local methods of refuse disposal. Therefore, the source of the pottery reflects mostly off site activity. Post-medieval redware and Peninsular House ware wasters were also found as backfill material behind the Thames and River Ravensbourne timber waterfront revetments on the Stowage Site: SOA96 (Divers 2004, Jarrett 2004). The ceramic profile of the site is mostly in keeping with the London area and especially other sites in the area such as the Stowage. 17th-century imported wares are usually more frequently encountered on the East and South East London waterfront sites, but are comparatively small in number on this site, but this was also the case from The Stowage river revetments.

POTENTIAL

The pottery has the potential to date the features in which it was found and to provide a sequence for them and a number of vessels would merit illustration. Other local comparable assemblages of post-medieval pottery have been excavated at The Stowage, site code SOA96 and Greenwich Magistrates Court, 9-10 Blackheath Road, Greenwich, site code: GHG00, the Old Seager Distillery site at Deptford Bridge, site code DEG00 and Payne's and Borthwick Wharf , site code BPZ06 (Jarrett 1999; Divers 2004; Jarrett 2008a; 2008b).

The redware pottery wasters from the GQR06 site can on the whole be paralleled to that from The Stowage (Jarrett 2004) but one unidentified redware form is encountered in the GQR06 assemblage and not paralleled elsewhere. It is crudely made, cylindrical in profile but with a concave wall profile and a simple rim, whilst its surfaces are reduced. A second vessel has a variation in its decoration and this is a Deptford/Woolwich jar, but has a double row rather than the typical single row of thumbing on the neck.

Research aims

No research aims are suggested as avenues of further research.

Recommendations for further work

A short pottery report is required for the publication of the site and it is recommended that two vessels are illustrated to supplement the text.

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APPENDIX 2: CERAMIC BUILDING MATERIAL ASSESSMENT

Dr Kevin Hayward

Introduction and Aims

Two crates and two shoe boxes of ceramic building material and stone (25 contexts), were retained at excavation from the site at Greenwich Reach, Thames Street, London Borough of Greenwich

This moderately sized assemblage (85 examples 37.2kg) was assessed in order to:

- Identify (under binocular microscope) the fabric and form of the ceramic building material in order to (where possible) date the early and later post-medieval development of the site especially the brick retained from the riverside wall [408].
- To ascertain whether any of this material may have been reused from the Tudor Greenwich Palace or even the Roman Temple Complex from Greenwich Park.
- Identify (under binocular microscope) the geological character and source of the stone.

Methodology

The building material was examined using the London system of classification with a fabric number allocated to each object. The application of a 1kg mason's hammer and sharp chisel to each example ensured that a small fresh fabric surface was exposed. The fabric was examined at x20 magnification using a long arm stereomicroscope or hand lens (Gowland x10).

Ceramic Building Material

Apart from one example of stone [205] the remainder of the building material recovered consisted of brick, peg and pan tile – nearly all of it post-medieval.

Roman

Fabric 2452

Two examples (220g) of residual abraded broken Roman building material were recovered from phase 7b [331] and phase 10 [397] dumps. Both are constructed from the early Roman fine sandy fabric 2452 (AD55-160). The imbrex from [331] is highly abraded and deserves no further comment. However the highly decorated roller stamped box flue (Brodribb 1987) tile [397] is rare and attests to the presence of a heated 2nd century building of some pretension in the vicinity of Greenwich, possible candidates are the Temple Complex at Greenwich Park

or a building sited along Watling Street such as a *mansio*. The stamp has been identified as Die 5 Chevron design (Betts *et al* 1997) which is found in small quantities in Surrey, London and has been dated to between (AD125-180). It is attached with opus signinum a second century innovation. It would therefore seem reasonable to date the example on fabric and form to the second century.

Medieval

A tiny quantity of medieval building material has been identified reflecting the paucity of medieval occupation along this stretch of the Thames.

Brick

Fabric 3030

Two examples of a dull earthy grey/green brick with maroon stripes were recovered from the backfill of the late 17th century early 18th century timber (sub phase 7b) dockyard [294]. These small narrow bricks have a date range of between 1400 and 1660 and so could conceivably be post-medieval. Given the paucity of medieval occupation along this stretch of the Thames, the origin of the fragments remains unclear – one possible source could be the Tudor Greenwich Palace.

Peg Tile

Fabric 2587

A tiny fragment of a medieval iron oxide rich peg tile fabric *2587* (1240-1450) was recovered from a mid to late 18th century (phase 8) alluvial layer [355].

Post Medieval

a) Brick

Fabric *3032; 3034; 3032nr3033* post Great Fire Clinker Bricks

3033; 3046; 3039nr 3046 Tudor Reds and Victorian Reds

A moderately sized assemblage (23 examples – 28.9kg) of broken and whole bricks were retained from a series of post-medieval 7-12 dumps and structures including the phase 8 river wall [408]

The assemblage is dominated by two groups of fabric. The first group consist of very poorly made unfrogged thin (50-55mm) wide (110mm+) red bricks made from a variety of inclusions that include the very fine sandy *3033*; the pebble rich *3046* and a siltier intermediate form *3039nr3046*. One example is chaff tempered [355] red bricks of this form were manufactured between 1450 and 1700 and include broken examples from late 17th to mid 18th century dumps [331] [355] [515] and whole bricks [249] reused in a mid 19th century wall [249]. The red bricks, from the river wall [408], however, are thicker (63mm), more regular and represent

late 18th and mid 19th century manufacture and should not be confused with the early post-medieval forms.

A second group, the older post-Great Fire clinker bricks *3032; 3034* and *3032nr3033* date from after 1664. The fabric *3032* (1664-1850) which makes up a bulk of the river wall [408] have very narrow (90-95mm) and elongate (220-230mm) form and in the case of the river wall are cemented by a soft shelly mortar typical of late 18th to early 19th century. They appear from the earliest recorded cbm [326] phase 6 (mid to late 17th century) at Greenwich Reach. Of note too is the appearance of the intermediate brick *3032nr3033* [295] from a phase 7c mid 17th to early 18th century dump – this fits in with the limited period of manufacture of this brick (1664-1725).

One final comment is the presence of slag and glaze on the surface of some of these bricks [355], attesting to their use in kilns or industrial firing. What is interesting is they are only associated with the older red *3033* group bricks (1450-1700) suggesting that this process was occurring no later than the early 18th century. Similar glazing on early post-medieval peg and pan tiles (1630-1850) from phase 7 levels (mid 17th to early 18th century onwards) would suggest that this activity was occurring then in and around the vicinity.

b) Peg Tile

Fabrics *2271; 2276; 2586; 3090*

Easily the most common type of post-medieval ceramic building material (42 examples 4.9kg), peg tile is represented in a variety of common post-medieval sandy *2271; 2276* and iron oxide *2586* and *3090* fabrics. Most have a fine moulding sand which is indicative of later post-medieval manufacture. The characteristic feature of this assemblage, most of which is found in late 17th to early-mid 18th phase 7c [287] [288] [295] and later 18th century phase 8 [355] dumps is the quantity of black kiln glaze, which like the bricks attests to kiln firing in and around the vicinity of Greenwich Reach at this time.

c) Pan Tile

Fabrics *2271; 2279; 3090*

Small quantities of pan tile (1630-1850) (5 examples 1110g) from phase 7c onwards merely reaffirm the mid 17th-19th century activity from this site. Again the presence of glazing and burning [205] including acicular gypsum crystals (bi-product) indicate kiln firing in and around the vicinity.

d) Floor and Wall Tile

Floor Tile Fabric: *1678*

Wall Tile Fabric: *3064*

One example of a large unglazed Flemish floor tile [39] (1600-1800) and two tin-glaze wall tiles [287] represent the sum total of wall and floor decoration

Only brief comment needs to be made on the tin-glaze wall tile. One example is a thick (25mm) polychrome tile with a dark blue/grey and green river scene typical of Dutch manufacture. Thick, tin-glaze tiles of this form and fabric were manufactured between 1600 and 1650 (C Jarrett pers. comm.) and probably reflect early 17th activity in the vicinity of Greenwich.

Mortar

3101

All of the mortar found adhered to the brick and tile was too soft to be typical mid-late 19th century. Instead the mortar is either very white (with varying amounts of quartz). The only other type of mortar is a mortar with shell inclusions and flecks of brick and clinker. This is only used to bond the brick used in the phase 8 river wall [408] and is typical of late 18th to early 19th century manufacture.

Stone

3120 Kimmeridge Shale (Upper Jurassic – Kimmeridgian – Dorset Coast)

A solitary fragment of burnt Kimmeridge Shale was found in a phase 12 (late 19th century) layer within the trestle foundations [205]. Kimmeridge Shale has a high organic carbon content and is often termed “Oil Shale”. It may have been used as fuel – possibly in association with earlier kiln firing.

Phase Summary

Phase 1 Natural Alluvium and Roman Ceramic Building Material

The presence of residual roller stamped Roman box-flue tile and imbrex in post-medieval dumps [331] [397] attests to the presence of Roman activity along this stretch of the Thames. The roller stamped die, fabric and attached opus signinum are indicative of a box flue used in a heated room from the 2nd century AD. A number of candidates should be considered. These include the temple at Greenwich Park; finds from the Power Station site SOA 96 and of course the proximity of Watling Street and with it a whole host of roadside structures such as *mansios.*

Phases 2-5 Late 15th to Late 16th century - Early to Mid 17th century

Nothing was recovered from these late medieval-early post-medieval phases associated with the construction of the clay river revetted walls. This is not surprising given the organic nature

of these constructions. However, two examples of medieval/early post-medieval ceramic building material a residual earthy brick fabric (1400-1660) from phase 7b dockyard [294] and a piece of unglazed iron oxide rich peg tile *2587* (1240-1450) at least indicate the recycling of medieval material in tiny quantities. Whether any of this building material derives from the Tudor Greenwich Palace or an associated structure is open to question.

Phase 6 Mid to Late 17th century

One example of a post-Great Fire stock moulded brick (1664-1850) from near a timber post [326] associated with the third phase of the revetted wall.

Phase 7 Late 17th to Mid 18th century

The first significant quantity (7.7kg) of ceramic building material was recovered from the four sub-phases associated with the migration of the river wall northwards. Although no in-situ brick was recorded, as it had been truncated by later river walls it is possible that the reused bricks recovered from the phase 12 19th century wall [249] may have belonged to this absent structure or indeed the disturbed remains of a small dock. The bricks, wide, shallow, poorly made stock red 3046 fabrics, are typical of this phase (and earlier) and not a 19th century construction.

The remainder of the assemblage consists of a mixture of post-Great Fire bricks and earlier red bricks; peg tile, pan tile, wall tile in features associated with the wall. The wall tile included a Dutch polychrome tin-glaze form typical of early to mid 17th century whilst the presence of pan tile (1630-1850) and stock moulded (1664-1850) and transitional brick (1664-1725) are all consistent with this phase of activity.

Of interest are the large quantities of glazed, burnt and vitrified pan tile, peg tile and brick that occur from this phase onwards. The presence of slag residue would indicate some type of industrial manufacture/ activity in the vicinity between the middle of the 17th and 18th centuries. The residue is only present on early post-medieval red bricks (1450-1700) indicating that this process was probably a 17th century activity.

Phase 8 (Mid – Late 18th century)

The first brick structure from this phase, the riverside wall/wharf [408] is made up of bricks and mortar that indicate middle to late 18th century construction. The bricks, narrow stock moulded post-Great Fire bricks (1664-1850) are bonded by a shell rich mortar with brick and clinker inclusions that typify mid-late 18th century-early 19th century bonding. There are some red bricks but these are thicker and more regular than the Tudor *3033* reused in [249] and typify the reintroduction of this fabric in the latter half of the 18th – 19th century.

Dumped material from this phase consists of burnt kiln peg tile and brick [355] deriving from the kiln manufacturing in the vicinity that is a feature of phase 7.

Phases 9, 10 and 11 (Late 18th-Late 19th century)

Other than a single fragment of undiagnostic post-medieval peg tile [399] and the residual Roman box flue tile [387] nothing else was recovered. Perhaps the reversion to a timber river wall at this time negated the need for building materials.

Phase 12 (Late 19th century)

The wall [249] is made of reused early post-medieval *3033* brick and associated structures contain dumps of kiln glazed peg tile from phase 7.

Distribution

Context	Fabric	Form	Size	Date range of material		Latest dated material		Spot date
35	3032	Stock moulded post great fire brick slag attached	1	1664	1850	1664	1850	1664-1850
37	2276	Peg Tile glazed in kiln	3	1480	1900	1480	1900	1480-1800
39	1678	Flemish Floor Tile unglazed	1	1600	1800	1600	1800	1600-1800
56	3046	Unfrogged red brick reused slag attached	1	1450	1700	1450	1700	1600-1700+
63	2276 3090	Peg Tile glazed	4	1200	1900	1480	1900	1600-1800
110	2279	Pan Tile	1	1630	1850	1630	1850	1630-1850
204	3090 2276	Pan tile and glazed peg tile	4	1480	1900	1480	1900	1630-1800
205	2271 2279 3120	Kimmeridge shale burnt, burnt pan tile with celesite residue and kiln glazed peg	3	50	1850	1630	1850	1630-1850
239	2276	Peg tile kiln glazed	1	1480	1900	1480	1900	1480-1900
249	3046	Red thin wide stock moulded brick	3	1450	1700	1450	1700	1600-1700+
287	3064 2586	Dutch Tin Glazed wall tile and peg tile	3	1180	1800	1630	1800	1630-1700
288	2586 2271	Kiln Glazed Peg tile and Pan Tile	3	1180	1850	1630	1850	1630-1750
290	2276	Kiln Glazed Peg Tile	2	1480	1900	1480	1900	1480-1900

Context	Fabric	Form	Size	Date range of material		Latest dated material		Spot date
294	2586 3030 3047	Kiln Glaze peg tile, paving brick and reused earthy medieval brick	8	1180	1900	1690	1900	1690-1800
295	2586 3032 3032n r3033	Stock bricks post great fie and transitional and peg tile	5	1180	1850	1664	1850	1664-1800
297	2587	Glazed kiln Peg Tile	1	1240	1450	1240	1450	1400+
326	3034	Stock moulded post great fire brick	1	1664	1850	1664	1850	1664-1850
327	2586	Peg Tile	1	1180	1800	1180	1800	1180-1800
329	2586 2276	Glazed kiln Peg Tile	2	1180	1900	1480	1900	1480-1800
331	2586 3046n r3039 2452	Roman imbrex Glazed kiln peg tile and red early post med brick	3	55	1800	1180	1800	1650-1800
355	3090 2276 2587 2586 2271 3046 3046n r3039	Glazed kiln peg tile and early post medieval brick burnt and glazed	14	1180	1900	1480	1900	1480-1750
397	2452 3104	Roller stamped box flue with opus signinum	1	55	400	100	400	100-160
399	2276	Peg Tile abraded	2	1480	1900	1480	1900	1480-1900
408	3032 3033 3101	18/19th cent red post great fire bricks and shellly lime mortar	14	1664	1900	1664	1900	1750-1825
515	3046 2271 3090	Early post medieval red brick shoulder peg tile and ribbed peg	3	1180	1800	1180	1800	1450-1750

Summary

- The assemblage is dominated by early post-medieval post-Great Fire brick and red *3033* bricks with quantities of roofing tile (pan tile; peg tile), floor tile and walling tile that all reflect the 16th-19h century development of the site.

- Only brick two structures [249] [408] are present reflecting the preference for clay and timber river walling during the northward migration of the river frontage between the 16th and 19th century.
- The riverside wall [408] can be dated to the latter half of the 18th century by brick fabric and mortar.
- The 19th century wall [249] is reusing early medieval red brick 3033.
- Some Roman and medieval construction/activity in the general area is attested to by residual box flue tile and medieval brick.
- Evidence for riverside kiln/ industrial activity between the middle half of the 17th and 18th century is attested to by the large quantity of glazed brick, pan and peg tile.

Recommendations

The assemblage has little chronological and fabric value other than the decorated Flemish Tin-Glaze Wall Tile [287], medieval brick [294] and the roller stamped box flue tile [397]. Two whole brick samples from the Victorian wall [249] and 18th century Riverside wall [408] should also be retained. As should a small quantity of the kiln glazed cbm.

No further work is required.

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APPENDIX 3: CLAY TOBACCO PIPE ASSESSMENT

Chris Jarrett

Introduction

A small sized assemblage of clay tobacco pipes was recovered from the site (1 box). Most fragments are in a fairly good condition, indicating that they had not been subject to much redeposition or were deposited soon after breakage. Clay tobacco pipes occur in fifteen contexts as small groups (under 30 fragments).

All the clay tobacco pipes (50 fragments, of which none are unstratified) were recorded in an ACCESS 2007 database and classified by Atkinson and Oswald's (1969) typology (AO) and 18th-century examples by Oswald's (1975) typology and prefixed OS. The pipes are further coded by decoration and quantified by fragment count. The degree of milling has been noted and recorded in quarters, besides the quality of finish. The tobacco pipes are discussed by their types and distribution.

THE CLAY TOBACCO PIPE TYPES

The clay tobacco pipe assemblage from the site consists of thirteen bowls, 36 stems and one nib or mouthpart. The clay tobacco pipe bowl types range in date between c. 1610 and 1860.

1610-1640
AO6: two spurred bowls with three quarter milling and a good finish.

1640-60
AO9: one spurred bowl with three quarters milling of the rim and a good finish.

1660-80
AO15: a single spurred bowl occurs with three quarter milling and a good finish.
AO18: a single straight-sided, heeled bowl with a quarter milling and of a good finish.

1680-1710
AO19: a single spurred bowl with half milling of the rim and a fair finish.
AO22: one heeled bowl with straight sides with a quarter milling and good finish.
A further three bowls survive as heels, but can not be confidently assigned to either of the AO20 or AO22 types but date to this period.

1700-80

AO25: two heels probably belong to this type of bowl and one is initialled H P, which possibly referred to a local pipe maker Henry Prick, Crane Street, Greenwich, 1704 or possibly Henry Parbatt, 1729, St George in the East.

1820-1860
AO28: only the spur of this type of bowl is recorded and has the initials J A. There is also evidence of leaf borders on the front and back of the bowl. The bowl was probably made by Joseph Andrews, Greenwich, 1823-28.

DISTRIBUTION

Table 1 shows the distribution of the clay tobacco pipes, showing the number of fragments, the date range of the types and the latest bowl, the types of bowls present, together with a spot date for each context tobacco pipes occur in. The clay tobacco pipes are found in phases 2 to 12.

Context	Phase	No. of fragments	Date range of bowl types	Latest dated bowl type	Bowl types (and makers)	Spot date
[110]	0	1	1700-1780	1700-1780	X1 AO25 (HP)	1700-1780
[111]	0	1			Stem	1580-1910
[204]	12	1	1680-1710	1680-1710	X1 AO19	1680-1710
[205]	12	9			X2 heels, late 17th-early 18th century	1680-1710
[287]	7c	4			X1 heel, late 17th-early 18th century	1680-1710
[294]	7b	4			X2 AO6	1610-1640
[295]	7c	1			Stem	1580-1910
[297]	7b	8	1660-1680	1660-1680	X1 AO18	1660-1680
[328]	7b	1			Stem	1580-1910
[329]	7b	1			Stem	1580-1910
[331]	7b	2			Stem	1580-1910
[355]	8	8	1640-1680	1660-1680	X1 AO9, x1 AO15	1660-1680
[398]	10	3	1770-1780	1770-1780	AO25	1770-1780
[399]	10	5	1820-1860	1820-1860	X1 AO28 (J A)	1820-1860
[478]	2	1	1680-1710	1680-1710	X1 AO19	1680-1710

Table 1. GQR09. Distribution of clay tobacco pipes. A spot date of 1580-1910 indicates that only stems were present in the context

SIGNIFICANCE OF THE COLLECTION

The clay tobacco pipes are of little significance at a local level. The bowl types present on the site fit within the typology for London and local Deptford and Greenwich clay tobacco pipe makers are represented in the assemblage. There is no evidence for clay tobacco pipe production on the site.

POTENTIAL

The clay tobacco pipes have the potential to date the contexts they were found in. None of the pipes require illustration.

Other local pipe assemblages have been recovered from The Stowage, site code SOA96, Borthwick Wharf and Payne's Wharf, site code BPZ06, Greenwich Magistrates Court, 9-10 Blackheath Road, Greenwich, site code: GHG00 and at the Seagers Distillery, Deptford Bridge, site code DEG00 (Jarrett 1999; Divers 2004; Jarrett 2008a; 2008b) and allow for comparisons to be made with the tobacco pipes at GQR06.

RESEARCH AIMS

No research aims are suggested for further avenues of research.

RECOMMENDATIONS FOR FURTHER WORK

There are no recommendations for further work. If a publication is required, then information should be taken from this report.

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APPENDIX 4: ANIMAL BONE ASSESSMENT

Kevin Rielly

Introduction

The excavations recorded a number of phases of river wall dating from the late medieval period through to the late 19th century. A small collection of animal bones were recovered from a series of fills associated with these various revetment features. Included amongst a general array of domestic waste was a concentration of cattle horncores, these taken from a late 17th/ early 18th century fill. All of the bones were hand collected and, no doubt a consequence of the waterlogged nature of the deposits, very well preserved.

Methodology

The bone was recorded to species/taxonomic category where possible and to size class in the case of unidentifiable bones such as ribs, fragments of longbone shaft and the majority of vertebra fragments. Recording follows the established techniques whereby details of the element, species, bone portion, state of fusion, wear of the dentition, anatomical measurements and taphonomic including natural and anthropogenic modifications to the bone were registered. The cattle horncore assemblage was recorded according to the criteria described in Armitage (1982), while calculations of shoulder heights were based on multiplication factors given in Driesch and Boessneck (1974).

Description of faunal assemblage by phase

The site stratigraphy has been divided into a number of phases. Those with bones include phases 7, 8, 9 and 13, all dating to the post-medieval era covering a period from the early 17th to the late 19th century.

Phase:	**6**	**7c**	**8**	**12**
Species				
Cattle	3	41	3	
Cattle-size	3	3	3	
Sheep/Goat		1	2	1
Sheep	1			
Sheep-size		2	1	
Dog			4	

Cat			3	
Small mammal			2	
Chicken			1	
Grand Total	**7**	**47**	**19**	**1**

Table 1: Counts of hand collected animal bones in each occupation phase

Phase 6 (mid to late 17th century)
A small number of bones were recovered from 3 fills associated with the revetment structure [347]/[365]. Those that could be identified to species include 3 cattle and 1 sheep fragment. Two of the cattle bones (a humerus and a metatarsus) were from veal calves.

Phase 7c (late 17th to mid 18th century)
The great majority of these bones were retrieved from 4 fills associated with land ties forming part of the river wall. Rather small quantities were taken from 3 of these fills (5 or less fragments) while a rather large collection (38 fragments), comprising 37 cattle horncores and one cattle scapula, was taken from fill [288] within land tie [289]. The other deposits provided a variety of cattle limb bone fragments plus one sheep mandible, all from adult individuals. The remainder of the phase 7c assemblage was taken from the fill [515] of an extensive cut feature [516], comprising a single cattle atlas, probably from a veal calf.

The cattle horncores (shown in Table 2) include about 50% each of sub-adult (juvenile aged between 1 and 2 years and sub-adult between 2 and 3 years) and adult forms (Young adult between 3 and 7 years and adult between 7 and 10 years). There are also a variety of sexes with a notable preponderance of oxen. The ‘types’ are limited to Medium horned and Long horned, categorised as those with lengths between 220 and 360mm, and in excess of 360mm respectively. It was possible to sex the majority of the adult specimens within these two size categories, including the two varieties of ox horncores as described in Armitage (1982). Several of these horncores had been butchered, including two with possible skinning marks and others showing the method(s) employed to remove the horncore from the skull. This generally involved an oblique chop below and anterior to the horn snapping each from the skull, or a more involved method with chops in front and below the horn followed or possibly preceded by splitting the skull between the horns.

Age	**Type**	**Sex**	***N***
Juvenile			1
Sub-adult			15
Adult	Medium horn	Bull	1
Young Adult		Ox	3
Adult		Ox	6
Adult		Cow	1
Young Adult	Possible Medium horn	?	2
Adult		?	1
Young Adult	Longhorn	Ox	3
		?Ox	2
		Bull	2
Total			**37**

Table 2. Representation of cattle horncores by age, 'type' and sex (after Armitage 1982)

Phase 8 (mid to late 18th century)
A small assemblage was retrieved from a dump deposit [355] situated above the land ties described in phase 7c. This included a few cattle, sheep, dog and cat bones. Both the cat and the dog collections represent at least two individuals. One of the dogs was clearly of advanced years, with ante mortem loss of three mandibular premolars, and a shoulder height (calculated from a humerus measuring 166.2mm at its greatest length) of 543.5mm (Harcourt 1974). Each of the three cattle bones in this assemblage were from large animals, probably signifying improved breeds.

Phase 12 (late 19th century)
The immediately pre-modern phase produced just one fragment, a sheep mandible, which was derived from fill [239] associated with one of the 16 timber trestle foundations forming part of structure [565].

Conclusion and recommendations for further work
The bone collections are well preserved and well dated, but, apart from one notable exception, the quantities retrieved from either individual contexts or phases tend to be rather small. The information from these small assemblages is obviously severely limited, however, there are clear indications for the early post-medieval fondness for veal as well as further

evidence for the introduction into the London meat markets of larger, no doubt improved, domesticates by the early 19th century (Rixson 2000, 170 and 184).

Of greater consequence is the concentration of cattle horncores from one of the phase 7c land tie fills. This was found to contain a mix of ages, sexes and 'types' (following Armitage 1982). As well as providing information on the variety of cattle entering the food markets by the early 18th century, there is also the potential source of this collection to be considered. Concentrations of horncores have been found at several other post-medieval sites in London, where they are generally interpreted as waste either from tanning or hornworking. It should be pointed out that a recent excavation at 43-81 Greenwich High Road provided evidence for a tanyard, apparently dating from the latter part of the 18th century. While somewhat later in date compared to the horncores from Greenwich Reach, there is always the possibility that this or some other tanyard may have been in operation earlier in the 18th century. This evidence would suggest that these horncores are more likely derived from a tanyard; however, the possible presence of a contemporary hornworker cannot be discounted. The probable source of a concentration of horncores could be decided by a review of its composition in comparison with other such collections. Unfortunately relatively few of these collections found in London have been subject to detailed study, generally confined to sites adjacent to the eastern extremity of the medieval city (West 1995), although with one example to the west, at Caroone House (Rielly and Yeomans 2008). Each of these examples date to a period when tanning had essentially moved to Bermondsey leaving the northwestern and in particular the northeastern areas adjacent to the City as the major centres of London's hornworking industry (Yeomans 2004, 77). There is the possibility that the hornworkers may have operated a selection procedure, choosing those cores with the largest quantity of raw material. This potential bias may allow for the identification of hornworking rather than tanning waste.

It is thus recommended that the composition of the horncore collection from this site should be compared with those from the previously described sites with the aim to elucidate the source of this material. In addition, the variety of cores can also provide further information on the 'types' of unimproved cattle imported to London during this period.

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APPENDIX 5: TIMBER ASSESSMENT

Damian Goodburn

Terms of reference of this report and aims

This report deals with the timber and roundwood structures found and recorded during the excavations at the Greenwich Reach development site. It will briefly describe these structures in terms of their woodworking attributes such as, raw materials used, methods of fastening etc. Some comments will be made on the structural sequence on the site but the overall stratigraphic sequence is covered in the main site assessment. This report also sets out to provide a summary quantification of the parts of the site archive that deal with the historic woodwork and to assess the relative importance of the results of the excavations on a local to national scale of importance. It also outlines what further analysis of the specialist elements of the archive might be desirable and likely to lead to useful results. Finally, a list of tasks is provided for the further analysis work leading to the production of a draft summary for publication. Clearly as this site was dominated by the finding of a number of historic timber structures it will be the case that there is considerable overlap between this report and the main report by N. Hawkins.

Introduction

The site lies just downstream of the current confluence of Deptford Creek and the tidal river Thames where it has the character of an inner estuary. It is low lying and the trenched area was won from the Thames in the late medieval to industrial periods. The timbers and roundwood survived because of a high level of waterlogging although later building works had truncated some structures. The site lies in the middle of Deptford which is historically known to have become an important ship building location from the 16th century. Shipwrights are documented as arriving in the area from east and south coast ports from the early 16th century in a variety of historical sources. Recent archaeological work on the upstream side of the confluence of the creek with Thames have shown direct evidence of shipbuilding and repair facilities dating from the 17th century onward (site PCA SOA 96, Divers 2004).

The range of timber and roundwood structures found, revetments, a ‘mudwall’ and foundations etc

One of the earliest structures found on the site was a collapsed pile and plank revetment which was exposed in a sondage trench through the truncated clay ‘mud wall’ (earthen river wall). The pile and plank structure had collapsed over a slab of reused clinker ship planking

initially giving the impression that it might have been part of the articulated side of a vessel. Later a series of thick dumps of clay were deposited and E-W wattle fence-like structures were built which may have been intended to stabilise the clayey mud. The mud was also laced with horizontal layers of bundles of fine regular rods of likely pollard or coppice origin. The mud wall, currently dated late 15th to 16th century, is one of a class of structures crucial for the development of the floodplain that have been little explored and recorded. The recording carried out at Greenwich Reach /amounts to a partial dissection of an early example of civil engineering for flood control which warrants considerable further study.

The range of timber structures found includes simple pile and plank river walls, some with traces of front bracing, and also more elaborate framed river walls with morticed sill beams. In one case the Thames river frontage was truncated but represented by a set of N-S land-ties. Some of the revetment structures were found running at c. 90 degrees to the river and must have served as inlet or dock walls. These structures range in date from c. 16th to 19th century. A group of trestle type assemblies dating to the late 19th century were found in the northern part of the site and were clearly timber foundations. Many of the structures found had second hand timbers in them of ship or building origin. In others elements such as retaining piles or stakes appear to have been made out of shipyard off-cuts or timbers probably prepared for shipyard use and then sold on. More detailed summaries of the woodworking evidence are presented below in chronological order. Further analysis of the material from the site and historical research etc may revise the dating of some of the structures a little.

The London comparative corpus of medieval and post-medieval waterfront woodwork

Waterfront carpentry, a practical standpoint

The archaeological work in the waterfront zones of London in the early port at the City of London is well known having been systematically carried out since the mid 1970s. A large comparative corpus exists of waterfront carpentry from the later medieval period (Milne 1992). The area has also produced some evidence of 16th and 17th century carpentry in the waterfront zone (Goodburn 2009). However, the key parallels for the evidence excavated at Greenwich Reach are mainly those of sites excavated in the post-medieval port area east of the City on both banks (Heard and Goodburn 2003) and recently also including sites on the lower River Lea. The most relevant source of comparative information showing some similarities in the general sequence of development on-site is that provided by the PCA excavations at Stowage, just up stream of the junction of Deptford Creek and the Thames (Divers 2004). Whilst some of the results of these more recent excavations have been published much is still at the archive stage, but this writer is familiar with the vast majority of that material. Some general trends in the evidence are replicated on many sites including

Greenwich Reach, two in particularly stand out. Firstly, the early use of imported softwood planking, previously known earliest from the mid 16th century in Southwark and the fastening of revetment sheathing planking on the water rather than land-fill faces of supporting uprights known from the 17th century in east London (alongside the earlier practice of putting the sheathing on the land-fill side).

Working as a waterfront carpenter in Shoreham docks, Sussex, before becoming an archaeologist has also provided insights for this writer. Finally, experimental historic woodworking based mainly on evidence recorded in the London region has again provided insights useful for the recognition, recording and interpretation of features of historic woodwork in waterfront structures.

Roundwood working, woodland crafts

Many types of roundwood structure have been recorded in the London region of medieval to 16th century date and a range of materials recorded used for the uprights and the weavers also a number of weave types (Goodburn 2009). During the analysis stage more of this material can be examined and compared with the Greenwich Reach wattlework using photos, plans and the results of the species ID work. The tradition of using roundwood bundles to bind the clay of mud walls is still not entirely dead and still provides a market for some cut roundwood and branch material, the larger bundles generally being called fascines and the smaller faggots.

The London shipwrightry comparative corpus

A small number of late medieval to 17th century large boats and barges have been found on the Thames and many of their characteristics recorded (Marsden 1996). These craft had all been built in the ancient clinker or ‘clencher’ style with hulls made of partially overlapping planking riveted at the overlaps and reinforced by inserted frame timbers. Many excavations in the London region have shown that clinker ship, boat and barge timbers were also often reused in waterfront construction, mainly used as slabs of conjoined planking for revetment sheathing (Goodburn 1988; Marsden 1996). However, the wrecks of vessels built in the contrasting ‘carvel’ style, introduced from southern Europe around 1500, have not been found recently on the Thames (Excepting the ‘Gresham Ship’ of the 1570s found in the outer estuary for which little detailed information is yet available). In carvel construction hull planks are set edge to edge held together by a strong framework (Goodburn 2002). Some other styles of construction are also documented for flat-bottomed barges on the river from the 16th century and are relevant to some of the later reused woodwork recovered on this project.

Timbers from carvel built ships and large boats have only recently been recognised and recorded systematically in the waterfront archaeology of the region and the same applies to diagnostic off-cuts and raw material produced by carvel shipyards (Heard and Goodburn 2003, Divers 2004). A range of material with nautical affiliations was found at Greenwich Reach, and any comments on it are provided from a standpoint of familiarity with the large London corpus (Goodburn 2002).

Notes on trends in changing tidal river levels on the Thames from late medieval times to the present day

Systematic recording and observations at the Trig Lane waterfront site in the City of London by G Milne initiated systematic archaeological investigations of changing historic relative sea- or tidal river levels (Milne and Milne 1982). It was seen that closely dated timber structures could be related by stratigraphy to adjacent contemporary dry surfaces, such as roads, hearths etc. A rough figure for occupation levels for the 14th century in the City was defined as c. +2.0m OD and the tidal range at c. 2.5m-3.0m. However, more recent waterfront investigations (eg MoLAS site in East Greenwich, GWW 07) have shown that the tidal range was much greater by around 1200 AD at c. 5m whilst by c. 1500 the largest tides were reaching c. 2.5 –2.75m OD. This level is c. 2.5m below the level reached today, and rising tidal levels would have been a key factor in the development of the Greenwich Reach site and the structures built there between c. 1500 and the 19th century.

The rising relative sea levels have required the building of ever greater flood defences along the tidal Thames and its estuary if the local landowners wanted to protect their land, drain salt marsh areas or win land. The flood defences took the form of land-fill with, river and wharf walls in the more developed areas and mud walls in those more rural. Recently this has again become a subject of concentrated historical as well as archaeological research. Some of the initial historical research suggests that there may be specific references to the site we are concerned with here and the building of seawalls around 1500 AD (Dr J. Galloway Centre for Metropolitan History pers comm. Galloway and Potts 2007). These sources must be explored during the analysis phase.

Methodology and quantification and some limitations of the archaeological

A compromise recording strategy

Unfortunately the evaluation trenches dug at the site failed to reveal the quantity, character and complexity of the sequence of timber structures found which constrained the archaeological work that could be carried out during the open excavation. After exposing structures in plan and largely in elevation there was insufficient time for the dismantling of sample areas of each exposed structure so that detailed specialist recording could be carried

out of individual timbers. The latter would be standard practice for parts of the earlier structures with a more abbreviated approach relying, mainly on plans, outline elevations, photographs and general descriptions for the most recent industrial age material (see Milne 1992; Heard and Goodburn 2003, Divers 2004 for parallels). The safety of some trench sections was also a limiting factor.

However, due to the fairly full exposure of most of the structures and the creation of 1:10 elevation drawings which are at the same scale as most individual 'timber drawings' (Spence 1990), it was possible to record many details straight onto the site plans and elevations. This writer was responsible for most of that work carried out during a number of site visits. It was also possible to take a number of tree-ring species ID samples as would have been the case with more individualised recording. Therefore, despite circumstances being far from ideal the specialist details recorded such as the raw materials, the types of conversion of the timbers used, jointing, fastening and evidence for previous use is broadly in line with practice recommended in English Heritage's Waterlogged Wood Guidelines (Brunning 1996). This policy to deal with the circumstances was evolved on-site during discussions between senior PCA staff, English Heritage representatives, the consultant archaeologist for the developers and this writer.

Quantification of the specialist archive

For reasons described above the principal component of the specialist archive comprises heavily annotated site plans, some of which are multi-context, and sample areas drawn in elevation at 1:10. These plans cover a total of 15 main structures or groups of associated timbers often covering several 5m grid squares. For most of the records only the sub sample of timbers sampled for tree-ring study or Species Id are numbered individually. Here we are counting several partially excavated lines of vertical wattlework (6) and laid roundwood bundle layers as one for the current purpose though they can be distinguished within the clay makeup of the large mud wall. In addition there are detailed individual drawn and pro-forma timber records for 10 individual timbers, mainly reused ship timbers of intrinsic interest in their own right.

The number of tree-ring study samples taken was not large as the vast bulk of the oak timbers potentially suitable for dating actually had too few annual rings and it was clear on-site that many actually selected were of borderline suitability. The number of timbers selected for tree- ring sampling was 12 of which 8 proved measurable but only two could be positively dated (see Appendix 6). Species ID samples were taken of a large sub sample of material when the timbers were not of the oak family which can be easily visually distinguished by the experienced eye. Sub samples of the round wood were also taken to establish species and age of cutting if possible. The total number of species ID samples taken was 58 from 11

separately numbered contexts (See Appendix 6). Additionally 6 more tree-ring samples have been taken from the early timbers in Structures [552] and [553] during the last phase of woodwork recording carried out off-site.

KEY WOODWORKING FEATURES OF THE TIMBER AND ROUNDWOOD STRUCTURES FOUND AT GREENWICH REACH IN APPROXIMATE CHRONOLOGICAL ORDER

Dating

This report is based mainly on spot dating of ceramic building material and pottery related to the stratigraphy, but it also takes account of the two tree-ring dates and woodworking technology broad dates. Two C 14 dates of early roundwood have also been produced related to the mud wall (Appendix 8). With further work the dating will no doubt be refined.

The wattlework and fascine layers with in the mud wall of c. 1470-1660 AD cal C14 date Structures, and layers [485],[479], [484], [476] , [403]

One of the most important groups of features found during the excavation were the vertical wattle structures and layers of roundwood bundles from within the clay dumping sequence of the mud wall. It was only possible to carefully expose relatively small areas at a time to examine their weave and makeup. The vertical wattlework varied in robustness some having small, round, oak stakes and other sections having cleft oak pole sections for stakes. The heavy wattlework found in post-medieval dock revetments in the River Lea recently and the heavy hurdles used along the southern edge of the Bermondsey Wall mud wall are likely to be suitable for comparison (Brown & Taylor forthcoming). The bundles of roundwood were surprisingly small as were the rods and branch wood (?) they were made from. They were probably small semi-standardised fuel faggots possibly what were termed ‘bavins’. In recent times the fascines bundles have been much larger. There may also be parallels with the use of dumped cleft branchwood in the Saxo-Norman flood banks. For the dissemination of the results of the investigation of the mud walls construction some form of oblique partly cut away section drawing supported by photographs could be prepared.

Further examination of the plans and photographs will be needed to check for variations in weave and materials some of which were clear on site, possibly implying there may be some degree of phasing in their construction. A key use which this material can be put to is to reconstruct woodland resources the builders were tapping into. A sub-sample of the horizontal roundwood and a selection of the weavers and stakes from the wattlework were sampled and identified (See Appendix 6). The study showed that a variety of species were used dominated by willow, probably grown in local ‘sally gardens’. The next most common

material was oak, probably from a little further inland. Indeed oak coppice still exists today further up the Ravensbourne which changes its name to Deptford Creek where it becomes tidal.

Collapsed river wall revetment Structure [552]

This simple pile and plank revetment of the Thames frontage was first seen towards the end of the excavation, as broken fragments of oak planking and second hand clinker ship boards. These were visible in the west side of a N-S machine cut sondage through the earlier part of land-winning sequence on the site (see main report). It was thought initially to be a dump of material within the make-up of the mudwall that was important to sample for tree-ring dating. However, on the last day of the excavation when this writer could not be in attendance the section was cut back and a small area of the E-W structure was revealed c. 0.7m wide and over 1.3m deep. The section of the revetment was planned and photographed extensively and eight of the timbers lifted for detailed recording and sampling for tree-ring dating. On reviewing the photographs taken of this final work on-site it appeared that a slab of the side of a vessel with hold lining planking, framing and outer clinker hull boards had been cut out and used as an impromptu revetment. However, following cleaning the timbers and recording them off-site the nature of the structure became clearer.

The main revetment was a simple pile and plank structure with sawn oak plank off-cuts used as sheathing set on the land-fill side of oak piles with two hewn flat faces eg pile [600] hewn c. 110mm thick and 210mm wide with barely trimmed waney rounded edges. Timbers prepared in this way cut to a thickness but without the edges being trimmed, resemble the 'sided' timbers stacked in shipyards in groups by shape and thickness, for shipwrights to turn over and lay their 'moulds' (templates) on. This was done to find and mark out frame timbers in ship building. As very similar timbers were also used later for revetment [412] etc it is clear that the supply of oak timber converted in this way was well established in the locale.

Three sections of the original sawn oak sheathing plank survived in the section explored c. 25mm thick [601] – [603] in varying widths from 140mm to 260mm. The planks were held by iron nails to the south faces of the piles supplemented by the land-fill pressure. The tops of the piles were rotten or machine truncated but the sheathed part of the revetment must have stood at least 1m high, probably rather more. Small boats and barges could have beached on the foreshore alongside such a river wall but it was clearly not an elaborate wharf.

A possible frontage to an early phase of mud wall

On re-examination of the photographs of the west section of the sondage and section 207 its clear we may have to consider the possibility the revetment was actually a low facing

revetment for the base of an earlier mud wall. This earlier wall would have lain slightly to the south of the later example with most of the roundwood structures in it. It is possible that the southernmost wattlework structure [485] lay with in the earlier mud wall. Today some Thames estuary mud walls still have a vestigial, low, planked revetment at the base to reduce tidal scouring.

A possible refacing of the revetment

It is impossible to be absolutely sure but it would appear that the timber frontage [552] was repaired at some point by fastening a slab of articulated clinker planking to the riverward side of the piles. Forming a repair in this way appears to be unusual but also occurred to some extent in a timber river wall of the 1580s excavated across the river at Limehouse (Tyler 2001).

A slab of second hand clinker ship planking used as an impromptu repair [553]

Trapped under the collapsed revetment [552] lay a slab of 7 clinker ship boards still held together with iron rivets or 'rove nails', the common fastening of later medieval to 16th century clinker boat builders working in SE England. Traces of where the original frame timbers had been fastened survived in the form of 30mm diameter treenail holes. Treenails were carefully made wooden pegs used with internal wedges and designed to hold like a rivet. The radially cleft oak boards were relatively thick at c. 35-45mm, in relation to their width of maximum c. 150mm. The lap nails were relatively close together and the lap waterproofing ('luting') was tarred animal hair laid as a mat rather than as strands as is often the case.

These proportions and features are best paralleled in clinker planking from the 15th to 16th centuries found at Hays Wharf and probably derive from a barge (showt) or small ship.

Key woodworking features of timber river wall Structure [412]

This structure was the first built after the mudwall, or most likely the extended mud wall, must have suffered some form of serious erosion (or possibly a breach). It was also a simple pile and plank structure resembling Structure [552] but had only been forced to the north a little way. The sheathing planking was set on the land-fill southern side of the piles in the medieval style and was largely held in place by the land-fill pressure. It was mainly of pit-sawn softwood c. 30-40mm thick and 340mm wide in c. 2.5m lengths. Also included was some second hand oak planking with redundant nail holes around 25-30mm thick. The whole structure had slumped towards the north as a result of land-fill pressure probably indicating a lack of extra bracing.

The piles were of oak set around 1m apart, some whole logs c. 150mm diameter whilst others were sawn half logs or sawn 1/4s from hewn baulks with only a few being of rectangular cross section. They were medium sized as a group with the largest being c. 200mm wide by 100mm thick. They had been cut from fast grown logs and were not generally suitable for tree-ring dating, but one a box quartered timber [497] did provide a sequence of annual rings that was matched giving a date after 1603 as it lacked sapwood (see Appendix 6). Most of the piles were fairly flat topped and survived up to c. +2m OD but strangely one had been cross cut with an axe forming a point on the top. Here and there small pieces of worked wood were found imbedded in the mud at the level at which the sheathing was added to the revetment. They may have been used as chocks to support it or leftovers from duck boards laid out to build it on the soft foreshore, at least one piece was part of a small cask. To drive the larger piles if not all of them a small ram or 'ringing engine' would have been needed.

Key woodworking features of timber river wall [558]

This E-W timber river wall was not fully exposed in plan and barely at all in elevation as it lay sandwiched between revetment Structures, [412] and [557] only about 0.3-0.5m out onto the foreshore. However, it could be seen that it was broadly similar to the revetment described above but importantly the sheathing planking was set on the Thames side and fastened on with iron nails. In some areas it was possible to excavate down a little and expose the uppermost surviving sheathing plank which proved to be of sawn softwood c. 25mm thick and c. 250mm wide in the east and pit-sawn elm 270mm wide and 25mm thick in the west. The piles were oak, smaller and much more closely set than in the previous structure. They were often set apparently in pairs as if they had been 'sistered up' as a repair or strengthening and were a mix of cleft and sawn half and whole logs (and one quartered), minimally trimmed with a small number hewn to a roughly rectangular cross section. The whole log piles were only c. 100mm in diameter whilst the half logs were up to 120mm across. The fact that the structure was still fairly vertical, unlike its predecessor may imply it was braced in some way. The top surviving height was just over 2.2m OD suggests that it would have been covered at high water on spring tides.

Towards the east side of the N-S sondage a N-S oak beam was found that predated the following revetment, timber [562]. It was a boxed half timber with mortices and rebates of 15th century character that may have been reused on the foreshore to support an upright post which was not preserved *in situ*. If there had originally been two of them they might have supported as structure such as an overhanging toilet or fishing platform.

Key woodworking features of timber river wall [557]

This E-W timber river wall was a simple pile and plank structure with the plank sheathing nailed on to the riverside faces on the piles. The sheathing planks survived up to two and a half courses high. They were of freshly pit-sawn, imported softwood now identified as Pinus sp. ie one of the pines. The planks were c. 25-30mm thickness and varied width from 240-320mm, in lengths of over 3m long. Two iron nails were used into each pile. The top was slightly truncated reaching + 2.59m OD (as shown on the elevation 200) at which height it was likely to have been over topped some centimetres by some of the larger tides of the year by the early 17th century.

The piles were of oak set on roughly 0.5m centres, mostly heavier than in the preceding two revetments; some seem to have been sapwood rich, sawn off-cuts from making other timbers, possibly ship frames. Other piles were roughly boxed heart rectangular section timbers c. 220-310mm wide by c. 90-110mm thick. Whilst most of the timber was fast to medium growth having few annual rings, a few were of slow to medium growth. One of the piles had 87 annual rings [496] and provided a last heartwood ring date of after 1611 (see Appendix 6). The parent oak is unlikely to have been felled later than the middle of the 17th century.

Evidence for front bracing of river wall [557] or possibly [558]

As this river wall was still fairly upright and it might have been expected to have had some form of bracing. No traces of land-ties set back to the south were found but just c. 0.6m+ to the north an irregular line of sloping chocks and stakes were found. These would have been typical supports for simple raking shores sloping up towards either timber frontage [558] or [557]. No shores were found *in situ* but the timbers must be there for a reason and the angle would be suitable for that function.

Wooden evidence for the silting up of the frontage and the growth in situ of two trees

As the frontage of river wall [557] was being exposed the stumps of two trees that had been growing *in situ* were uncovered [341] and [336]. Tree [336] was the larger at c. 110mm diameters and c. 0.6m from the roots to the truncated top at c. 2.01m OD. The roots must have been growing in damp ground at c. +1.4m OD, in the case of [341] the levels were a little lower. Both trees were of a similar diameter and on-site [336] looked like a young elm. Whilst this writer is aware of native trees such as oaks and alders growing a few centimetres below the highest spring tide levels along the sheltered shores of tidal creeks running off the Solent, these levels would have been very low for tree-growth at Deptford by c. the mid 17th century. The evidence is taken here as suggestive of the extension of the waterfront to the north with a slow process of land-filling to a higher level behind it. The location and character of the worked timber remains noted below also support this interpretation.

Vestigial timber evidence for the extension of the frontage out over the foreshore

On site it was clear that the remains of a largely demolished phase of revetting of an E-W frontage had been revealed that only survived as vestigial oak stakes just south of the later brick river wall [408]. The truncated land-tie assembly survived as the very landward end only in the NE corner of grid square 90/180. It comprised a fast grown oak land-tie beam c. 100mm thick and c. 200mm deep, axe truncated to the north, with an E-W elm pole lock bar set in a socket cut through the oak beam. The lock bar was retained by two squared stakes hewn from oak poles. This assembly was placed in the [561] timber group but should be separated out from the sloping front brace chocks (see above). It is likely that other small timbers grouped in [561] were actually vestigial remains of land-tie retaining piles.

Key woodworking features of NNW –SSE timber inlet walls Structures [347] and [365]

Two low, pile and plank revetments were found on the eastern side of the site Structures. [347] and [309]. They were not quite parallel but appeared to run c. NNW to SSE forming both sides of an inlet. Unfortunately due to strict time and access constraints the timber inlet walls could not be investigated in detail. However, a rapid sondage showed that at least two courses of softwood plank sheathing c. 30mm thick and 350mm wide survived in the western structure [347]. The revetted inlet could have functioned as a small boat dock or a place where small barges could moor on the foreshore.

Key features of timber group [563]

From a woodworking point of view this group is very heterogeneous including a large oak beam running diagonally NW-SE in the NW corner of the site and a scatter of cleft oak and softwood pole stakes. The diagonal oak beam might possibly have been some form of reinforcing to the corner of another possible inlet. The stake scatter could have been leftovers from temporary structures built higher up on the won land surface. A fragment of softwood planking set on edge in the NW corner of the trench had no obvious function.

Key features of the land-ties for demolished timber river wall revetment Structure [559]

Next in the broad structural sequence on the site are a set of 8 rather similar and substantial N-S land-tie assemblies for an E-W timber river wall that was destroyed by the building of the later E-W brick river wall [408]. The use of such a substantial group of land-ties indicates that the destroyed frontage was relatively tall perhaps a minimum of 2m high. It is also quite likely that it did not initially have front braces preventing vessels coming along side, ie it may well have been able to function as a wharf frontage. All the land-tie assemblies were fitted with two sets of lock bars each with a pair of anchor stakes. Each assembly comprised a main oak

beam over 6m long by a maximum of c. 250-300mm square, which had been hewn from a fairly straight, whole log only minimally hewn flat on each face. The branches were also neatly lopped off. The larger ends of the beams that were towards the butts of the parent trees were placed towards the frontage where they had all been crudely axe severed when the brick river wall was built.

The anchor stakes were of oak and many had clearly been cut from pit-sawn off-cuts almost certainly derived from neighbouring ship building and repair concerns. The tops of the anchor stakes were neatly bevelled with axes or adzes to reinforce otherwise weak corners for the driving of them. The lockbars were tapered and neatly and cleverly fitted in tapering undercut laps cut in the upper faces of the land-tie beams, a feature not seen by this writer elsewhere in the post-medieval port. No separate fastenings were needed but more fitting time would have been required.

In the NW corner of the trench a slightly smaller 'scantling' (cross section) beam was fastened on a NW- SE line with iron spikes into the N-S land-ties suggesting that it was reinforcing a corner in the frontage. This could have been either an inlet or perhaps the very mouth of Deptford Creek at the time. On the eastern side of the area covered with the land-tie assemblies lay the remains of a very truncated E-W land-tie. All that survived was the very butt end of an oak land-tie beam and an oak lock bar. This is important because it would have anchored the projecting frontage of a block of land won from the Thames. The much later c. 1860s dock wall had cut the rest of it away.

Unfortunately the oak used for the land-tie assemblies was all rather fast grown and generally had too few annual rings to sample for tree-ring dating. Of those samples that were taken some were found to match each other but not any known reference chronology. Currently it would seem that this structure dates to the later 17th century based on pottery building material and clay pipe spot dates, certainly the woodworking technology would be commensurate with that period or a little earlier or later. It must date well after the tree-ring dated pile of 'after 1611' from Structure [557] in any case.

In the N-W corner of the area occupied by the land-tie assemblies lay an oak plank pad with a mortice and three oak wedges [564] in it. Lying close by was a softwood pole hewn square, the base of which had a triangular tenon. The tenon clearly once fitted the mortice in the plank pad. The pole was presumably part of a light temporary structure built on the wharf.

Key features of timber river wall [555] / [356] c. 18th century (prob late 18th century)

This E-W timber river wall was not fully excavated for safety reasons and could only be examined in plan and from the landward side. However, it could be seen that it was

structurally more elaborate than the others described so far as it was supplied with a mortised sill beam or 'base plate'. The sill sat on the base of what had been a brick river wall Structure [408]. The uprights were not piles but posts tenoned into the sill beam, with the sheathing on the water faces of the posts. The structure would have been the work of a timber frame carpenter working quickly with second hand timbers and off-cuts, rather than semi-skilled labourers. One of the levelling marks used in frame prefabrication may have survived on the elm sill beam used over much of the length. To the west the elm sill was scarfed with an edge halved scarf to an eroded softwood beam which was mortised for the oak posts. None of the post tenons were pegged and all the posts that could be closely examined were reused oak timbers with relict mortice or infill stave joints. They were mostly of box quartered or box halved conversion. These clearly had their origins in old timber framed buildings. The posts were spaced c. 0.75m apart in the west but further apart in the eastern section, perhaps due to the existence of earlier mortices in the second hand timber. They varied a little in size from c.110 by 140mm to 120 by 220mm wide. Late in the life of the river wall some additional uprights were added, on the riverward side, together with extra planking.

The plank sheathing was extremely heterogeneous with reused planks from carvel built ships and barges built in the local double planked Thames style, but also including what looked like leftovers from various different, probably nautical, projects. The species range included oak, elm, softwoods and even what appeared to have been some hard tropical timber with an interlocked grain. At the east end three oak waste slabs had been nailed to the land-fill faces of three posts, it is uncertain why, possibly for localised strengthening before the land-fill dumping.

Reused ship and barge planking partially examined in situ

Towards the east and west ends of the frontage re-used carvel ship planking was found, distinguished by the presence of many redundant treenail holes. Even more distinctive was the second hand barge planking used for revetment sheathing and repairs at the east end. The barge planking at the western end of the eastern section was made of one slab of decayed oak hull planking c. 35mm thick. The plank edges were rebated and sealed with tarred hair 'setwork'.

Sheathing of 20mm thick softwood had then been nailed on lengthways over a layer of tarred hair followed by yet another layer of 15mm thick softwood sheathing planking. This slab of planking must have come from the bottom of an old much used vessel. The rebated plank edges are a feature of the last generation of Thames barges built up until 1930.

Further east another slab of the bottom of a barge had been reused to reface the original oak planking of the river wall and was just visible, but largely hidden by the main sheathing

planking. In this case the softwood planking was laid in three layers, secured by turned iron nails, with tarred hair between the layers. Each layer was made up of 15mm thick softwood. This novel laminated system of construction is unlikely to predate the early 19th century when many novel systems of boat and barge construction were being experimented with. There is also a small possibility that the slab of material was derived from a timber tank of some form.

The top of this river wall survived up to c. 2.6m OD where it was truncated by rot, more recent building activity and machining. The original height would probably have been well over 3.0m OD. Judging from the shore side occupation levels recorded on other sites in the region for the late 18th century.

Key features of timber river wall Structure [556] early 19th century

To the north of riverwall [555] the latest river frontage on the site was partially exposed in plan. The uprights retaining the plank sheathing were now set to the riverward face of the sheathing planking, a reversion to earlier techniques. Decayed traces of the upright tops were found as high as 3.3m OD in this case. The uprights were boxed heart or sawn box halved timbers, and towards the tops often only the heartwood survived. The plank sheathing was of manually sawn softwood c. 70-75mm thick. Two lengths of planking were seen set on edge running NW-SE between the river wall and the preceding example but their purpose is uncertain.

Some features of dock inlet walls Structures [401] and [402] c. 1860s

These two timber dock lining walls ran N-S on the east side of the site and stratigraphy and map regressions strongly suggest that they are two phases of timber lining for a known dock of the 1860s onward. Neither structure could be excavated fully and recorded in detail. The later dock lining was made exclusively of softwood whilst the earlier was made of a mix of recycled oak ship timber and off cuts and softwood.

Key features of the timber trestle foundations of the late 19th century

On the north side of the trench several curious trestle-like structures were uncovered in pits and lifted. They comprised a short basal horizontal beam with a tenoned in upright post supported by two diagonal braces nailed into ‘scutches’. These structures have been found on two other sites to the west in Southwark where they were clearly used as a way of providing building foundations in wet ground without the use of a pile driving rig. In the two other cases eg at MoLAS site ROZ 00 (Heard and Goodburn 2003, 40), the foundations were of 18th century date and had held the floor of the timber building above ground level. As in the other cases many of the timbers used at Greenwich Reach were second hand ships timbers

including ship deckbeams of tropical timber. A part of this foundation raft included several 'loose' ship timbers such as two axe hewn, 'V' shaped 'floors' (lower frame elements). On close examination they proved to be hewn out of naturally curved crooks of softwood. It would seem they are evidence of the breaking of a foreign built ship probably of North American or Scandinavian origin.

An assessment of the overall importance of the timber and roundwood structures excavated at Greenwich Reach

Arguably the most important structure of roundwood, earth and a little timber excavated and recorded at Greenwich Reach is the 'mudwall' river defence in its two or more phases. This is the most extensive examination of such a structure of the late medieval to 16th century period that has been carried out in the London area. On that basis it could be said to be of regional (Thames Gateway) or possibly national interest in the context of rising sea levels and their study. Indeed the Greater Thames Estuary Archaeological Research Framework strongly recommends more research in this area as they are important structures for the economy, topography and historical development of the region from Roman times onward and there has been little detailed investigation of them (Williams and Brown 1999, 32).

The sequence of timber river walls and dock inlets is of regional and local interest in a core area of maritime industrial development at Deptford. The use of woodland resources and local industrial by products (shipyard waste and leftovers) at this site is of regional interest as it includes everything from small varied roundwood, through native timber of oak and elm to imported softwood and latterly tropical timber. These materials demonstrate the nature of local, regional and international timber trade connections for the world port that London was becoming.

The clinker ship planking reused in the earliest river wall revetment built on site appears to be the earliest nautical woodwork found in the Deptford area to date, a link to the period of its founding as a zone of royal shipbuilding early in the reign of Henry VIII (Friel 1995, 31). As the large shipyards developed around the mouth of the creek and the new carvel ship building technology was adopted we might suspect that the preparation of ship construction timber became more systematic and large scale. Some of this material seems to have found its way into local building projects outside the shipyards such as the river walls at Greenwich Reach, as did diagnostic waste products of the yards near the site. In the later phases of use of the area ship breaking and repair was also carried out on site and timbers from the end of wooden ship building on the Thames were also found made of exotic materials. The site has local and possibly regional importance for the information it provides on Thames side maritime industries.

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The general potential for further analysis of the woodworking evidence recorded at Greenwich Reach

The quality of the records are such they can be updated and subdivided to facilitate several lines of analysis flagged up above. It should be possible to provide graphic reconstructions of the two phases of the early 'mud wall' with its various wattlework and faggot bundle layers and the early revetment of its northern edge. This can then be compared with information from the small number of other sites where seawall investigations have been carried out but often remain inaccessible, such as at Atlas Wharf on the Isle of dogs (MoLAS unpublished), and the PCA site at Bermondsey Wall West (Brown & Taylor forthcoming). This line of enquiry will satisfy key research aims for the Greater Thames Estuary area. A useful by product of this work will be the provision of more double checked data for reconstructing changing relative sea levels in the historic period.

The sequence of structures contains varied timber raw materials which document the gradual replacement of native wood and timber by foreign timber and masonry. This pattern can be compared with sequences from other sites in the region to assess how typical it is. The creation of clear single phase drawings and some elements of reconstruction for which there is solid evidence (Such as the front bracing of timber river wall Structure [557]) are necessary here.

The clinker ship timbers from the late 15th to early 16th centuries are worthy of clear illustration reconstructed from timber drawings off-site and plan and photographic records made on site. The collation of information on ship, barge, boat and shipyard timbers found at the site will extend London's corpus and shed some light on the key local industries of ship building , repair and breaking from Tudor times to the late 19th century.

Further work required to facilitate this analysis

A series of tasks are required for the analysis to reach useful conclusions and those relating to the woodwork are laid out here.

1) The analysis of 6 tree-ring samples from the earliest feature on-site, taken during the last phase of recording off-site. This should provide tighter dating for the mud wall construction which may allow better correlation with historical records. The ship planking will be more closely dated and the timber sourced to a region. Then a short report for all the samples on-site could be produced.

2) The Woodwork Specialist could compile a fully referenced comparative analysis summary text with c. 10 draft illustrations up-dating this text. Time = c. 7.5 days

3) PCA drawing office and or photographic dept's time to update figures in the house style.

4) Project liaison and editing time for the Woodwork Specialist = c. 1 day

5) Liaison with Dr Jim Galloway of the Centre for Metropolitan History at the Institute of Historical Research, Senate House re the historical evidence relating to the Deptford mudwalls. Time 1 day (with meeting after dating tightened as much as possible).

6) Thus the total time required for the Woodwork Specialist to produce a fairly full summary analysis report with up to 10 draft scale figures would be c. 8.5 days

Acknowledgements

Thanks are due to the senior archaeologist Neil Hawkins PCA for considerable assistance on-site and in making accessible the site records. Thanks are also due to Tim Bradley PCA for liaison on-site and Jon Butler for liaison on the first stages of post excavation work.

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APPENDIX 6: DENDROCHRONOLOGICAL ANALYSIS

Tree-ring spot dates and wood identifications from archaeological samples

Ian Tyers

Eleven samples from timbers excavated at Greenwich Reach, Norway Road, London SE10 (sitecode GQR06, NGR c. TQ 3788 7777) were submitted for dendrochronological assessment and analysis, a further 60 samples of wattle and structural timbers were submitted for wood identification. A total of 2 timbers were dated to the 17th century, 2 other groups, a pair and a group of 3, were linked but no absolute dating evidence could be obtained for these timbers. The identification samples included imported softwoods, the wattles included a typical mix of native coppice, hedgerow and understory species.

Methodology

Each dendrochronological sample was supplied as a complete cross section, it is assumed in the absence of other information that these were obtained from the optimum location for sapwood and bark survival from the timber. The identification samples were supplied as sub-samples of timbers, the majority of this material was derived from wattle-like groups.

Each dendrochronological sample was assessed for the wood type, the number of rings it contained, and whether the sequence of ring widths could be reliably resolved. For dendrochronological analysis samples need to be either oak (Quercus spp.), or another of the dendrochronologically viable timbers types, to contain 50 or more annual rings, and the sequence needs to be free of aberrant anatomical features such as those caused by physical damage to the tree whilst it was still alive. The supplied samples were oak. Standard dendrochronological analysis methods (see e.g. English Heritage 1998) were then applied to each suitable sample. The sequence of ring widths in each sample were revealed by preparing a surface equivalent to the original horizontal plane of the parent tree with a variety of bladed tools. The width of each successive annual growth ring was revealed by this preparation method. The complete sequence of the annual growth rings in the suitable samples were then measured to an accuracy of 0.01mm using a micro-computer based travelling stage. The sequence of ring widths were then plotted onto semi-log graph paper to enable visual comparisons to be made between sequences. In addition cross-correlation algorithms (e.g. Baillie & Pilcher 1973) were employed to search for positions where the ring sequences were highly correlated (Tyers 2004). Highly correlated positions were checked

using the graphs and, if any of these were satisfactory, new composite sequences were constructed from the synchronised sequences.

The t-values reported below were derived from the original CROS algorithm (Baillie & Pilcher 1973). A t-value of 3.5 or over is usually indicative of a good match, although this is with the proviso that high t-values at the same relative or absolute position needs to have been obtained from a range of independent sequences, and that these positions were supported by satisfactory visual matching.

Table 6 lists examples of the matches for the composite of the 2 datable oak samples from this site against reference series. This table is intended to show that there is independent corroboration for the dates given to them in this report, this series matches many other reference series.

The wood type of the identification samples was determined by taking thin sections of each timber in three planes (radial, transverse and tangential sections). The microscopic comparison of these sections with permanent reference slides and reference keys such as Schweingruber (1978), and Wheeler *et al* (1986) enabled identifications to be made for the material. The identifications are given in Table 2. It should be noted that it is usually not possible to identify timbers to species level, and that juvenile material, as typically used in wattle, does not always exhibit the diagnostic features necessary to separate similar species.

Results

The submitted dendrochronological material comprised 11 oak samples. The details of the separate samples are provided in Table 1.

Nine of the samples contained measurable sequences, the other 2 contained sub-optimal numbers of rings. These 9 sequences were measured successfully (Table 1). Three groups of the sequences obtained were found to cross-match each other (Tables 3, 4 & 5) to produce internally consistent groups of samples (Figures 1, 2 & 3). Each group was mathematically converted to a single composite sequence at its synchronised position and these, and the individual series were compared with medieval and later tree-ring data from throughout England and elsewhere in Europe. No consistent dating positions were identified for 2 of the composite sequences, and the remaining unmatched individual series. A group of 2 samples was found to match to post-medieval reference data from London and the surrounding area (Table 6).

Discussion

Unfortunately tree-ring analysis of timbers does not yield dating evidence for every sampled timber, and as here it can on occasion yield relatively little dating evidence for an assemblage of material. On different sites the reasons for this failure are many and varied; many timbers have too few rings, individual trees may have responded to unusual and localised events or conditions during their lifetimes, or there may be inadequate reference data for the period and area. The latter reason cannot be entirely excluded at Greenwich Reach since they are probably from a period when the data sets are relatively poor, and given its location it is quite plausible they represent one or more imported groups (although they are of typically English characteristics; fast grown and relatively young). The principal problem is that each of the composite series contains a rather low number of rings, effectively only just within the minimum requirements. The finding that some groups of the samples could be synchronised suggests that each may represent a group of trees originally from a single woodland, hedge, or copse etc., felled and brought to the site in separate groups, though not necessarily at separate periods. This perhaps means that the tree-ring series within them are not entirely dominated by non-climatic signals, unfortunately despite this not precise dating has been obtained for 2 of these groups. It is worth noting that the 2 dated samples are those with the most annual rings.

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Figure 1. Bar diagram showing the arbitrary relative positions of group 1 from the matched tree-ring sequences for samples from Greenwich Reach, site GQR06. KEY; Heartwood (white bars), sapwood (hatched bars). These were felled in the same winter.

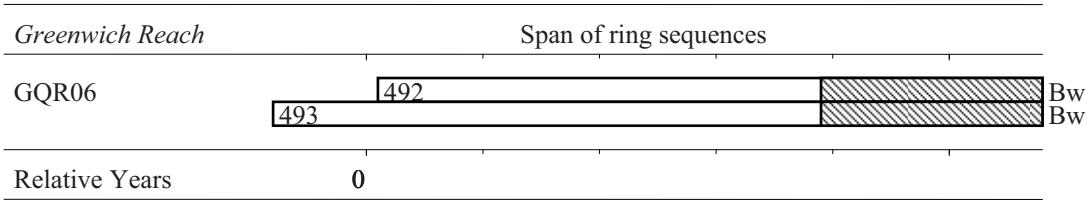

Figure 2. Bar diagram showing the arbitrary relative positions of group 2 from the matched tree-ring sequences for samples from Greenwich Reach, site GQR06. KEY; Heartwood (white bars), sapwood (hatched bars). Two of these were felled in the same winter, it is probably reasonable to assume the third was also.

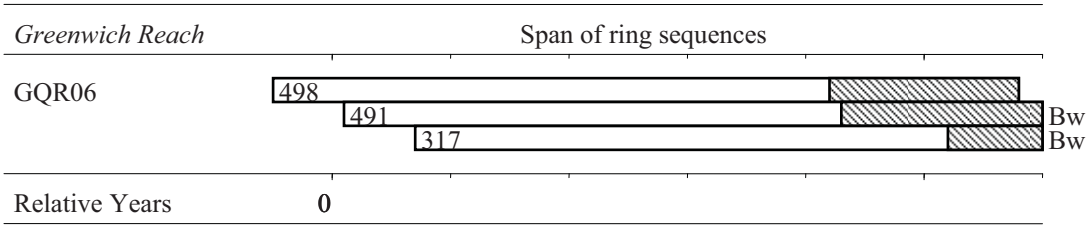

Figure 3. Bar diagram showing the dating positions of the 2 dated tree-ring samples from Greenwich Reach, site GQR06. KEY; Heartwood (white bars). These 2 samples have no sapwood, the results probably indicate activity in the first half of the 17th century.

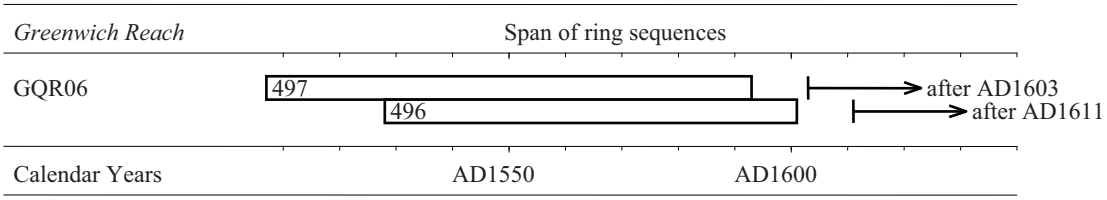

Table 1. Details of the 11 oak (Quercus spp.) dendrochronological samples from Greenwich Reach, site GQR06.

Sample	Size (mm)	Rings	Sap	Date of measured sequence	Interpreted result
307	200 x 160	53	19+Bs	undated	-
310	280 x 280	*c*. 30	-	not measured	-
317	210 x 130	54	8+Bw	undated	-
491	200 x 135	60	17+Bw	undated	-
492	255 x 130	58	19+Bw	undated	-
493	265 x 140	67	19+Bw	undated	-
494	340 x 140	65	9	undated	-
496	270 x 145	74	-	AD1528-1601	after AD1611
497	185 x 155	87	-	AD1507-1593	after AD1603
498	399 x 255	64	16	undated	-
552	210 x 120	*c*. 0		not measured	-

KEY

+Bw indicates last ring is a complete growth ring felled in winter. +Bs indicates last growth ring is incomplete; this is a spring felled timber.

Table 2. Details of the 60 identification samples from Greenwich Reach, site GQR06.

KEY

Castanea; *Castanea sativa*, chestnut, introduced (NB juvenile oak is not always distinguishable from this)

Picea/Larix; *Picea abies/Larix decidua*, Spruce/Larch, import from Europe

Pinus; *Pinus sylvestris* type, Scots pine, import from Europe or Scotland

Pomoideae; fruitwood indeterminate, crab apple, hawthorn, etc., native

Prunus; fruitwood indeterminate, blackthorn, sloe etc., native

Quercus; *Quercus* spp., Oak, one of 2 species, native

Salicaceae; willows and/or poplars indeterminate, native

Ulmus; *Ulmus* spp., Elm, several species, native

Cf. Comparable to, condition too poor for some key microscopic feature, also juvenile material (as typically used in wattle) does not always exhibit diagnostic features.

Context	Description	Number, wood types
403	post	2 Salicaceae
403	wattle	6 Quercus, 2 Salicaceae
404	faggots	4 Salicaeae, 3 cf. Castanea/Quercus, 1 cf. Pomoideae
415		1 Picea/Larix
479	post	1 Salicaceae
479		8 Prunus/Pomoideae, 1 Quercus, 1 cf. Castanea/Quercus
484	weaver	3 Quercus, 1 Pomoideae, 1 Prunus
484	wattle	4 Quercus
484		11 Salicaceae
486		1 Salicaceae
487		1 Salicaceae
488		1 Pinus
489		1 Pinus
490		1 cf. Ulmus
499		4 Quercus, 1 Salicaceae

Table 3. The t value (Baillie & Pilcher 1973) between 2 undated series from Greenwich Reach, site GQR06.

	493
492	7.74

Table 4. The t values (Baillie & Pilcher 1973) between 3 undated series from Greenwich Reach, site GQR06.

	491	**498**
317	4.72	5.47
491		5.94

Table 5. The t value (Baillie & Pilcher 1973) between the 2 dated series from Greenwich Reach, site GQR06. This material was combined for use in Table 6.

	497
496	3.84

Table 6. Showing example t values (Baillie & Pilcher 1973) between the composite sequence from samples 496 & 497 and oak reference data.

	Greenwich Reach AD1507-AD1601
Berkshire, Windsor Castle (Tyers *et al* 1997)	6.60
Cambridgeshire, St Andrews Church Wimpole (Bridge 1998)	5.64
Essex, Stambourne Church (Tyers & Groves 2000)	5.64
Kent, Cobham Hall Gravesend (Arnold *et al* 2003)	5.85
London, Barking Abbey Rd barrels (Tyers 2001)	7.12
London, White Tower (Miles & Worthington 1997)	5.78
London, Victoria Wharf (author unpubl.)	5.57
Surrey, Reigate 43 High St (Tyers 1990)	6.27

Tree-ring spot dates from archaeological samples:
Greenwich Reach, London SE10 (sitecode GQR06) batch 2

Six additional samples from timbers excavated at Greenwich Reach, Norway Road, London SE10 (sitecode GQR06, NGR c. TQ 3788 7777) were submitted for dendrochronological assessment and analysis. A total of 3 timbers were dated to the 16th century.

Methodology

Each dendrochronological sample was supplied as a complete cross section, it is assumed in the absence of other information that these were obtained from the optimum location for sapwood and bark survival from the timber.

Each dendrochronological sample was assessed for the wood type, the number of rings it contained, and whether the sequence of ring widths could be reliably resolved. For dendrochronological analysis samples need to be either oak (Quercus spp.), or another of the dendrochronologically viable timbers types, to contain 50 or more annual rings, and the sequence needs to be free of aberrant anatomical features such as those caused by physical damage to the tree whilst it was still alive. The supplied samples were oak. Standard dendrochronological analysis methods (see e.g. English Heritage 1998) were then applied to each suitable sample. The sequence of ring widths in each sample were revealed by preparing a surface equivalent to the original horizontal plane of the parent tree with a variety of bladed tools. The width of each successive annual growth ring was revealed by this preparation method. The complete sequence of the annual growth rings in the suitable samples were then measured to an accuracy of 0.01mm using a micro-computer based travelling stage. The sequence of ring widths were then plotted onto semi-log graph paper to enable visual comparisons to be made between sequences. In addition cross-correlation algorithms (e.g. Baillie & Pilcher 1973) were employed to search for positions where the ring sequences were highly correlated (Tyers 2004). Highly correlated positions were checked using the graphs and, if any of these were satisfactory, new composite sequences were constructed from the synchronised sequences.

The t-values reported below were derived from the original CROS algorithm (Baillie & Pilcher 1973). A t-value of 3.5 or over is usually indicative of a good match, although this is with the proviso that high t-values at the same relative or absolute position needs to have been obtained from a range of independent sequences, and that these positions were supported by satisfactory visual matching.

Table 2 lists examples of the matches for the 3 datable oak samples from this site against reference series. This table is intended to show that there is independent corroboration for the dates given to them in this report, these series match many other reference series.

Results

The submitted dendrochronological material comprised 6 oak samples. The details of the separate samples are provided in Table 1.

Five of the samples contained measurable sequences, the other contained too few rings for successful analysis. These 5 sequences were measured successfully (Table 1). None of the material cross-matched each other, however 3 individual sequences matched with medieval tree-ring data from London and South-East England (Table 2). These 3 samples were derived from a revetment plank (552b), and 2 re-used clinker boat planks (605 & 606). Each of these samples comprised heartwood with no evidence for sapwood on the samples. The results suggest these timbers are probably from the mid- & later- 16th century, with the revetment probably slightly later than the boat. None of this material cross-matched with the dated or undated material from the initial group of samples from the same site (Tyers 2009).

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Figure 1. Bar diagram showing the dating positions of the 3 additional dated tree-ring samples from Greenwich Reach, site GQR06. KEY; Heartwood (white bars). These samples have no sapwood.

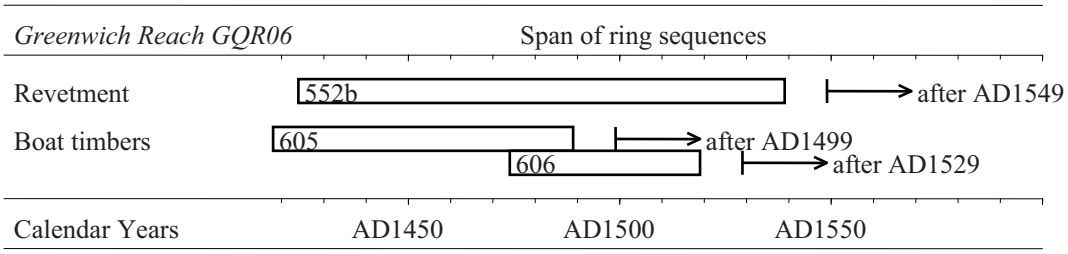

Table 1. Details of the 6 additional oak (*Quercus* spp.) dendrochronological samples from Greenwich Reach, site GQR06.

Sample	Size (mm)	Rings	Sap	Date of measured sequence	Interpreted result
552a	115 x 15	97	-	undated	-
552b	225 x 25	116	-	AD1424-1539	after AD1549
604	135 x 35	70	-	undated	-
605	110 x 40	72	-	AD1418-1489	after AD1499
606	145 x 30	46	-	AD1474-1519	after AD1529
607	115 x 25	*c*. 40	-	not measured	-

Table 2. Showing example *t* values (Baillie & Pilcher 1973) between the sequences from the 3 additional dated samples from Greenwich Reach, site GQR06 and oak reference data.

	552b AD1424-AD1539	605 AD1418-AD1489	606 AD1474-AD1519
Berkshire, Windsor Castle (Tyers *et al* 1997)	9.40	4.50	4.13
Hampshire, Romsey Abbey (Hillam & Groves 1994)	5.58	6.42	4.11
Hampshire, Mary Rose (Bridge & Dobbs 1994)	4.09	7.52	6.94
Kent, Longport Farmhouse (Tyers 1996c)	6.53	4.78	5.79
London, Hays Wharf (Tyers 1996a; b)	8.37	8.75	6.29
London, Q. Eliz Hunting Lodge (Tyers 1993)	4.37	5.94	5.52
Surrey, Reigate Priory School (Bridge 2003)	9.13	4.06	4.13
Lady & Baron Dacre, Eworth (Tyers 2007)	7.49	5.69	4.42

APPENDIX 7: LEATHER AND TEXTILE ASSESSMENT

Märit Gaimster

Five bags of leather and other organic material were retrieved from Greenwich Reach; the finds were cleaned before assessment, and are now stored wet. The material consists almost exclusively of cobbling waste, with the exception of two pieces of woven woollen cloth and the possible piece of a wooden patten. It falls into two distinct groups, one dating from the 17th and early 18th centuries and the other from the 19th century.

Recommendations

Textile and leather finds form an integral component of the material recovered during excavation and should, where relevant, be included in any further publication of the site. For this purpose the material should be seen by specialists for further identification and analysis. Following further examination, some pieces may need conservation for inclusion with the final site archive.

context	description	pot date
287	leather sole; heel part only; L 145mm+; W 60mm	1580-1730
294	incomplete leather sole with sturdy heel; L 165mm+; W 80mm	1650-1730
	incomplete leather sole; L 170mm+; W 55mm	1650-1730
	four pieces of cobbling waste	1650-1730
297	incomplete leather sole with pointed toe; L 180mm+; W 70mm	1650-1730
	substantial piece of woven woollen fabric; *c.* 350 x 350mm; ?part of clothing	1650-1730
	rectangular piece of woven woollen fabric; *c.* 180 x 200mm	1650-1730
355	33 pieces of cobbling waste; including complete leather sole with narrow, squared toe; L 220mm; W 65mm	1820-1900
	piece of worked wood; ?part of patten	
397	one piece of cobbling waste	mid- to late 19th c

APPENDIX 8: RADIOCARBON DATING ASSESSMENT

C.R. Batchelor

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INTRODUCTION

This report provides the results of radiocarbon dating undertaken by Quaternary Scientific (University of Reading) in connection with the proposed development of land at Greenwich Reach, London Borough of Greenwich (site code: GQR06). Two samples of waterlogged wood ([403] and [479]) were selected for dating, from the top and bottom of a series of wattle, estimated as being medieval to Early post-medieval in date.

METHODS

Radiocarbon dating

The two samples ([403] and [479]) were submitted for radiocarbon dating to Beta Analytic (Table 1). The results have been calibrated using OxCal v4.0.1 (Bronk Ramsey, 1995, 2001 and 2007) and IntCal04 atmospheric curve (Reimer et al., 2004).

RESULTS OF THE RADIOCARBON DATING

The two pieces of wattle wood ([403] and [479]) have been radiocarbon dated to 480 to 290 cal BP and 490 to 290 cal BP respectively. The δ13C (‰) values are consistent with that expected for organic sediment, and there is no evidence for mineral or biogenic carbonate contamination. These dates are synchronous and indicate construction of the wattle fence during the medieval to post-medieval cultural period as estimated.

Table 1: Results of the radiocarbon dating, Greenwich Reach, London Borough of Greenwich (site code: GQR06)

Laboratory Code / Method	Sample number	Material	Un-calibrated Radiocarbon Years Before Present (yrs BP)	Calibrated age BC / AD (BP) (2-sigma, 95.4% probability)	δ13C (‰)
Beta-259105 AMS method	[403]	Wattle wood	350 ± 40	1470 to 1660 cal AD (480 to 290 cal BP)	-27.2
Beta-259106 AMS method	[479]	Wattle wood	340 ± 40	1460 to 1660 cal AD (490 to 290 cal BP)	-27.4

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APPENDIX 9: CONTEXT INDEX

Context No	Plan No	Sect/elev No	GdSq	Structure No	Phase	Type	Description	High	Low	notes	Prov date
200	0	0	85/195	565	12	Timber	Timber foundation	0	0	Timber trestle foundation, part of late 19th century structure [565]	P.Med
201	0	0	80/195 85/195	565	12	Timber	Timber foundation	0	0	Timber trestle foundation, part of late 19th century structure [565]	P.Med
202	0	0	80/195	0	12	Timber	Timber	0	0	Dumped ships timber	P.Med
203	0	0	80/195	0	12	Timber	Timber	0	0	Dumped ships timber	P.Med
204	0	0	85/175 85/180	565	12	Fill	Backfill of construction cut [235]	3.13	3.04	Backfill of construction cut [235] for timber trestle foundation [234]	P.Med
205	0	0	85/175	565	12	Fill	Backfill of construction cut [211]	2.86	0	Backfill of construction cut [211] for timber trestle foundation [208]	P.Med
206	206	0	80/175	565	12	Timber	Timber pile	3.65	0	Timber pile, relating to late 19th century structure [565]	P.Med
207	207	0	80/175 85/175	565	12	Timber	Timber foundation	3	2.88	Timber trestle foundation, part of late 19th century structure [565]	P.Med
208	208	0	85/175	565	12	Timber	Timber foundation	2.75	2.7	Timber trestle foundation, part of late 19th century structure [565]	P.Med
209	209	0	80/175	0	12	Cut	Construction cut for timber post [206]	2.93	2.57	Construction cut for timber post/pile [206]	P.Med
210	210	0	80/175 85/175	565	12	Cut	Construction cut for timber trestle foundation [207]	2.88	2.67	Construction cut for late 19th century timber trestle foundation [207]	P.Med
211	211	0	85/175	565	12	Cut	Construction cut for timber trestle foundation [208]	2.86	2.38	Construction cut for late 19th century timber trestle foundation [208]	P.Med
212	212	0	85/180	565	12	Timber	Timber foundation	3.5	2.67	Timber trestle foundation, part of late 19th century structure [565]	P.Med
213	213	0	80/180 85/180	565	12	Timber	Timber foundation	3.39	0	Timber trestle foundation, part of late 19th century structure [565]	P.Med
214	214	0	85/180	565	12	Cut	Construction cut for timber trestle	3.16	2.18	Construction cut for late 19th century timber trestle foundation [212]	P.Med

Context No	Plan No	Sect/elev No	GdSq	Structure No	Phase	Type	Description	High	Low	notes	Prov date
							foundation [212]				
215	215	0	80/180 85/180	565	12	Cut	Construction cut for timber trestle foundation [213]	3.13	2.76	Construction cut for late 19th century timber trestle foundation [213]	P.Med
216	216	0	80/175 80/180 85/175 85/180	565	12	Timber	Timber foundation	3.02	2.94	Timber trestle foundation, part of late 19th century structure [565]	P.Med
217	217	0	80/175 80/180 85/175 85/180	565	12	Cut	Construction cut for timber trestle foundation [216]	3.02	2.61	Construction cut for late 19th century timber trestle foundation [216]	P.Med
218	218	0	85/190	565	12	Timber	Timber foundation	3.43	2.69	Timber trestle foundation, part of late 19th century structure [565]	P.Med
219	219	0	85/190	565	12	Cut	Construction cut for timber trestle foundation [218]	3.1	2.37	Construction cut for late 19th century timber trestle foundation [218]	P.Med
220	220	0	75/190 80/190	565	12	Timber	Timber foundation	3.03	2.9	Timber trestle foundation, part of late 19th century structure [565]	P.Med
221	221	0	75/190 80/190	565	12	Cut	Construction cut for timber trestle foundation [220]	3.06	2.79	Construction cut for late 19th century timber trestle foundation [220]	P.Med
222	222	0	85/185	565	12	Timber	Timber foundation	3.64	2.76	Timber trestle foundation, part of late 19th century structure [565]	P.Med
223	223	0	85/185	565	12	Cut	Construction cut for timber trestle foundation [222]	3.18	2.5	Construction cut for late 19th century timber trestle foundation [222]	P.Med
224	224	0	80/185 85/185	565	12	Timber	Timber foundation	3.05	3.01	Timber trestle foundation, part of late 19th century structure [565]	P.Med
225	225	0	80/185 85/185	565	12	Cut	Construction cut for timber trestle foundation [224]	3.17	2.65	Construction cut for late 19th century timber trestle foundation [224]	P.Med
226	226	0	80/185	565	12	Timber	Timber post/pile	3.26	0	Timber post/pile, part of late 19th century structure	P.Med
227	227	0	80/185	0	12	Cut	Construction cut for timber [226]	3.06	2.49	Construction cut for late 19th century timber [226]	P.Med
228	0	0	0	0	12	Timber	Timber post/pile	0	0	Timber post/pile, part of late 19th century structure	P.Med
229	0	0	0	0	12	Timber	Timber post/pile	0	0	Timber post/pile, part of late 19th century structure	P.Med
230	230	0	90/180 90/185	0	12	Timber	Timber post/pile	3.42	0	Timber post/pile, part of late 19th century structure	P.Med
231	231	0	90/185	0	12	Cut	Construction cut	3.21	2.7	Construction cut for timber post [228]	P.Med

Context No	Plan No	Sect/elev No	GdSq	Structure No	Phase	Type	Description	High	Low	notes	Prov date
							for timber post [228]				
232	232	0	90/185	0	12	Cut	Construction cut for timber post [229]	3.16	2.88	Construction cut for timber post [229]	P.Med
233	233	0	90/180 90/185	0	12	Cut	Construction cut for timber post [230]	3.21	2.97	Construction cut for timber post [230]	P.Med
234	234	0	85/175 85/180	565	12	Timber	Timber foundation	2.95	2.92	Timber trestle foundation, part of late 19th century structure [565]	P.Med
235	235	0	85/175 85/180	565	12	Cut	0	3.13	2.47	Construction cut for late 19th century timber trestle foundation [234]	P.Med
236	0	0	80/175 85/175	565	12	Fill	Backfill of construction cut [210]	2.88	0	Backfill of construction cut [210] for timber trestle foundation [207]	P.Med
237	0	0	80/175 80/180 85/175 85/180	565	12	Fill	Backfill of construction cut [217]	3.02	0	Backfill of construction cut [217] for timber trestle foundation [216]	P.Med
238	238	0	85/180	0	12	Timber	Timber post/pile	3.73	0	Driven timber post/pile, part of late 19th century structure	P.Med
239	0	0	85/180	565	12	Fill	Backfill of construction cut [214]	3.16	0	Backfill of construction cut [214] for timber trestle foundation [212]	P.Med
240	0	0	90/185	0	12	Fill	Backfill of construction cut [231]	3.19	0	Backfill of construction cut for timber post [228]	P.Med
241	0	0	90/185	0	12	Fill	Backfill of construction cut [232]	2.88	0	Backfill of construction cut [232] for timber [229]	P.Med
242	0	0	90/180 90/185	0	12	Fill	Backfill of construction cut [233]	3.21	0	Backfill of construction cut [233] for timber [230]	P.Med
243	0	0	85/185	565	12	Fill	Backfill of construction cut [215]	0	0	Backfill of construction cut [215] for 19th century timber trestle foundation [213]	P.Med
244	0	0	85/185	565	12	Fill	Backfill of construction cut [223]	3.18	0	Backfill of construction cut [223] for 19th century timber trestle foundation [222]	P.Med

Context No	Plan No	Sect/elev No	GdSq	Structure No	Phase	Type	Description	High	Low	notes	Prov date
245	0	0	80/185 85/185	565	12	Fill	Backfill of construction cut [225]	3.17	0	Backfill of construction cut [225] for 19th century timber trestle foundation [224]	P.Med
246	0	0	80/185	0	12	Fill	Backfill of construction cut [227]	3.06	0	Backfill of construction cut [227] for timber [226]	P.Med
247	247	0	80/190 85/190 80/195 85/195	565	12	Timber	Timber foundation	0	0	Timber trestle foundation, part of late 19th century structure [565]	P.Med
248	248	0	85/190 85/195	565	12	Timber	Timber foundation	0	0	Timber trestle foundation, part of late 19th century structure [565]	P.Med
249	249	0	80/175	0	12	Masonry	Brick wall	3.83	3.8	Late 19th century brick wall	P.Med
250	250	0	80/190 85/190 80/195 85/195	565	12	Cut	Construction cut for timber trestle foundation [247]	2.92	2.8	Construction cut for late 19th century timber trestle foundation [247]	P.Med
251	251	0	85/190 85/195	565	12	Cut	Construction cut for timber trestle foundation [248]	2.85	2.59	Construction cut for late 19th century timber trestle foundation [248]	P.Med
252	252	0	80/175	0	12	Cut	Construction cut for brick wall [249]	2.83	2.68	Construction cut for late 19th century brick wall [249]	P.Med
253	253	0	75/190	556	10	Timber	Timber pile	3.01	0	Driven timber pile, part of revetment structure [556]	P.Med
254	253	0	75/190	556	10	Timber	Timber pile	3.03	0	Driven timber pile, part of revetment structure [556]	P.Med
255	253	0	75/190 80/190	556	10	Timber	Timber pile	2.98	0	Driven timber pile, part of revetment structure [556]	P.Med
256	253	0	80/190	556	10	Timber	Timber pile	2.94	0	Driven timber pile, part of revetment structure [556]	P.Med
257	253	0	80/180	556	10	Timber	Timber pile	3.05	0	Driven timber pile, part of revetment structure [556]	P.Med
258	253	0	80/180	556	10	Timber	Timber pile	2.98	0	Driven timber pile, part of revetment structure [556]	P.Med
259	253	0	85/190	556	10	Timber	Timber pile	3.02	0	Driven timber pile, part of revetment structure [556]	P.Med
260	253	0	85/190	556	10	Timber	Timber pile	3.14	0	Driven timber pile, part of revetment structure [556]	P.Med
261	253	0	85/190	556	10	Timber	Timber pile	3.12	0	Driven timber pile, part of revetment structure [556]	P.Med
262	253	0	85/190	556	10	Timber	Timber pile	3.09	0	Driven timber pile, part of revetment structure [556]	P.Med
263	0	0	0	0	0	VOID	VOID	0	0	VOID	0
264	0	0	0	0	0	VOID	VOID	0	0	VOID	0
265	0	0	0	0	0	VOID	VOID	0	0	VOID	0
266	555	0	80/190 85/190	555	9	Timber	Timber plank	2.64	0	Timber plank, part of revetment structure [555]	P.Med
267	0	0	95/195	565	12	Fill	Backfill of	3.26	0	Backfill of construction cut [269] for 19th century timber trestle	P.Med

Context No	Plan No	Sect/elev No	GdSq	Structure No	Phase	Type	Description	High	Low	notes	Prov date
							construction cut [269]			foundation [268]	
268	268	0	95/195	565	12	Timber	Timber foundation	2.71	0	Timber trestle foundation, part of late 19th century structure [565]	P.Med
269	269	0	95/195	565	12	Cut	Construction cut for timber trestle foundation [268]	3.28	2.3	Construction cut for late 19th century timber trestle foundation [268]	P.Med
270	0	0	95/195	565	12	Fill	Backfill of construction cut [273]	3.16	0	Backfill of construction cut [273] for 19th century timber trestle foundation [271]	P.Med
271	271	0	95/190 95/195	565	12	Timber	Timber foundation	2.69	0	Timber trestle foundation, part of late 19th century structure [565]	P.Med
272	0	0	0	0	0	VOID	VOID	0	0	VOID	0
273	273	0	95/190 95/195	565	12	Cut	Construction cut for timber trestle foundation [271]	3.16	0	Construction cut for late 19th century timber trestle foundation [271]	P.Med
274	555	0	85/190	555	9	Timber	Timber pile	2.54	0	Driven timber pile, part of revetment structure [555]	P.Med
275	555	0	85/190	555	9	Timber	Timber pile	2.54	0	Driven timber pile, part of revetment structure [555]	P.Med
276	0	0	90/195 90/200	0	12	Fill	Backfill of posthole cut [278]	3.2	0	Backfill of construction cut for posthole [278]	P.Med
277	277	0	90/200	0	12	Timber	Timber post	3.35	0	Square timber post, part of late 19th century structure	P.Med
278	278	0	90/195 90/200	0	12	Cut	Construction cut for square post [277]	3.2	0	Construction cut for late 19th century square post [277]	P.Med
279	555	0	90/190	556	10	Timber	Timber pile	3.12	0	Driven timber pile, part of revetment structure [556]	P.Med
280	280	0	90/190	0	10	Timber	Timber pile	3.11	0	Driven timber pile, associated with revetment structure [556]	P.Med
281	280	0	90/190	0	10	Timber	Timber pile	3.19	0	Driven timber pile, associated with revetment structure [556]	P.Med
282	282	0	90/190 90/195	0	13	Masonry	Brick structure	0	0	20th century intrusive brick feature	P.Med
283	0	0	90/200	0	12	Timber	Timber post	3.56	0	Timber post, late 19th century	P.Med
284	0	0	90/200	0	12	Timber	Timber post	3.67	0	Timber post, late 19th century	P.Med
285	285	0	90/200	285, 402	11	Timber	Timber structure	3.41	0	Timber revetment structure composed of timber piles and planks, represents the eastern side of an 1860s dock/slipway [402]	P.Med
286	286	0	90/185	0	12	Timber	Timber post/pile	3.14	0	Timber post/pile, associated with late Victorian structure	P.Med

Context No	Plan No	Sect/elev No	GdSq	Structure No	Phase	Type	Description	High	Low	notes	Prov date
287	287	0	95/180 95/185	0	7c	Layer	Dump layer	1.94	1.79	Post-medieval dump layer	P.Med
288	0	0	95/180 95/185 95/190	0	7c	Fill	Backfill of construction cut [289]	2.07	0	Backfill of construction cut [289] for timber beam [298]	P.Med
289	289	0	95/180 95/185 95/190	559	7c	Cut	Construction cut for timber beam [298]	2.07	0	Construction cut for timber beam [298], part of land-tie structure [559]	P.Med
290	0	0	95/180 95/185 95/190	0	7c	0	Backfill of construction cut [291]	2.03	0	Backfill of construction cut [291] for timber beam [309]	P.Med
291	291	0	95/180 95/185 95/190	559	7c	Cut	Construction cut for timber beam [309]	2.03	0	Construction cut for timber beam [309], part of land-tie structure [559]	P.Med
292	0	0	0	0	0	VOID	VOID	0	0	VOID	0
293	0	0	0	0	0	VOID	VOID	0	0	VOID	0
294	294	0	95/180 95/185 95/190	347, 365	7b	Fill	Backfill of dock/inlet [347]/[365]	1.84	1.53	Backfill of timber dock/inlet [347]/[365]	P.Med
295	0	0	95/185 95/190	0	7c	Fill	Fill of pit [296]	1.58	0	Fill of pit [296]	P.Med
296	296	0	95/185 95/190	0	7c	Cut	Pit	1.58	0.84	Pit	P.Med
297	297	0	95/180 95/185 100/185	347, 365	7b	Fill	Backfill of dock/inlet [347]/[365]	1.84	1.54	Backfill of timber dock/inlet [347]/[365]	P.Med
298	298	0	95/180 95/185	559	7c	Timber	Timber structure	1.88	1.59	Timber land-tie structure, composed of timbers [299-308]. Part of overall land-tie structure [559].	P.Med
299	298	0	95/180 95/185	298, 559	7c	Timber	Timber beam	1.88	1.85	Timber beam, part of land-tie structure [298] & overall structure [559]	P.Med
300	298	0	95/185	298, 559	7c	Timber	Timber beam	1.67	0	Timber beam, part of land-tie structure [298] & overall structure [559]	P.Med
301	298	0	95/180 95/185	298, 559	7c	Timber	Timber beam	1.66	1.59	Timber beam, part of land-tie structure [298] & overall structure [559]	P.Med
302	298	0	95/185	298, 559	7c	Timber	Timber lock-plate	1.85	0	Timber lock-plate, part of land-tie structure [298] & overall structure [559]	P.Med
303	298	0	95/185	298, 559	7c	Timber	Timber lock-plate	1.69	0	Timber lock-plate, part of land-tie structure [298] & overall structure [559]	P.Med
304	298	0	95/185	298, 559	7c	Timber	Timber post	1.97	0	Timber post, part of land-tie structure [298] & overall structure	P.Med

Context No	Plan No	Sect/elev No	GdSq	Structure No	Phase	Type	Description	High	Low	notes	Prov date
										[559]	
305	298	0	95/185 100/185	298, 559	7c	Timber	Timber post	1.54	0	Timber post, part of land-tie structure [298] & overall structure [559]	P.Med
306	298	0	95/185	298, 559	7c	Timber	Timber post	1.87	0	Timber post, part of land-tie structure [298] & overall structure [559]	P.Med
307	298	0	95/185	298, 559	7c	Timber	Timber post	1.9	0	Timber post, part of land-tie structure [298] & overall structure [559]	P.Med
308	298	0	95/185	298, 559	7c	Timber	Timber post	1.74	0	Timber lock-plate, part of land-tie structure [298] & overall structure [559]	P.Med
309	309	0	95/180 95/185 95/190	559	7c	Timber	Timber structure	1.88	1.49	Timber land-tie structure, composed of timbers [310-319]. Part of overall land-tie structure [559].	P.Med
310	309	0	95/185 95/190	309, 559	7c	Timber	Timber beam	1.88	1.87	Timber beam, part of land-tie structure [309] & overall structure [559]	P.Med
311	309	0	95/185	309, 559	7c	Timber	Timber beam	1.8	1.68	Timber beam, part of land-tie structure [309] & overall structure [559]	P.Med
312	309	0	95/180 95/185	309, 559	7c	Timber	Timber beam	1.65	1.49	Timber beam, part of land-tie structure [309] & overall structure [559]	P.Med
313	309	0	95/185	309, 559	7c	Timber	Timber lock-plate	1.87	0	Timber lock-plate, part of land-tie structure [309] & overall structure [559]	P.Med
314	309	0	95/185	309, 559	7c	Timber	Timber lock-plate	1.7	0	Timber lock-plate, part of land-tie structure [309] & overall structure [559]	P.Med
315	309	0	95/185	309, 559	7c	Timber	Timber post	2.43	0	Timber post, part of land-tie structure [309] & overall structure [559]	P.Med
316	309	0	95/185	309, 559	7c	Timber	Timber post	2	0	Timber post, part of land-tie structure [309] & overall structure [559]	P.Med
317	309	0	95/185	309, 559	7c	Timber	Timber post	1.96	0	Timber post, part of land-tie structure [309] & overall structure [559]	P.Med
318	309	0	95/185	309, 559	7c	Timber	Timber post	1.81	0	Timber post, part of land-tie structure [309] & overall structure [559]	P.Med
319	309	0	95/185	309, 559	7c	Timber	Timber post	1.95	0	Timber post, part of land-tie structure [309] & overall structure [559]	P.Med
320	320	0	95/185	561	6	Timber	Timber stake	1.64	0	Driven timber stake, part of a number of timbers representing a disjointed phase of land-ties [561]	P.Med
321	320	0	95/185	561	6	Timber	Timber stake	1.81	0	Driven timber stake, part of a number of timbers representing a disjointed phase of land-ties [561]	P.Med
322	320	0	95/185	561	6	Timber	Timber post	1.75	0	Driven timber post, part of a number of timbers representing a	P.Med

Context No	Plan No	Sect/elev No	GdSq	Structure No	Phase	Type	Description	High	Low	notes	Prov date
										disjointed phase of land-ties [561]	
323	320	0	95/185	561	6	Timber	Timber post	1.76	0	Driven timber post, part of a number of timbers representing a disjointed phase of land-ties [561]	P.Med
324	320	0	95/185	561	6	Timber	Timber post	2.08	0	Driven timber post, part of a number of timbers representing a disjointed phase of land-ties [561]	P.Med
325	320	0	95/185	561	6	Timber	Timber post	1.57	0	Driven timber stake, part of a number of timbers representing a disjointed phase of land-ties [561]	P.Med
326	320	0	95/185	561	6	Timber	Timber post	1.63	0	Driven timber stake, part of a number of timbers representing a disjointed phase of land-ties [561]	P.Med
327	327	0	95/180	347, 365	7b	Fill	Backfill of timber dock/inlet [347]/[365]	1.78	1.54	Backfill of timber dock/inlet [347]/[365]	P.Med
328	328	0	95/180	347, 365	7b	Layer	Backfill of timber dock/inlet [347]/[365]	1.54	1.34	Backfill of timber dock/inlet [347]/[365]	P.Med
329	0	0	95/180	0	7b	Fill	Fill of cut [330]	1.69	1.23	Fill of cut [330]	P.Med
330	330	0	98/180	0	7b	Cut	Construction cut for timber planking [332]	1.69	1.07	Construction cut for timber revetting planks [332]	P.Med
331	331	0	95/180	0	7b	Layer	Dump layer	1.61	1.25	Dump layer in location of timber planking [332]	P.Med
332	332	0	95/180	0	7b	Timber	Timber structure	1.51	1.44	Timber planking supported by piles, forming revetment including timbers [334], [335] & [337]	P.Med
333	557	0	95/180	557	6	Timber	Timber plank	2	1.92	Timber plank, part of revetment structure [557]	P.Med
334	332	0	95/180	0	6	Timber	Timber post	1.72	0	Timber post, associated with planking [332]	P.Med
335	332	0	95/180	0	6	Timber	Timber post	1.7	0	Timber post, associated with planking [332]	P.Med
336	336	0	95/180	0	6	Timber	Tree	2.01	1.41	Tree apparently in situ, next to another tree, [341]	P.Med
337	332	0	95/180	0	6	Timber	Timber post	1.56	0	Timber post, associated with planking [332]	P.Med
338	561	0	95/180	561	6	Timber	Timber post	1.51	0	Driven timber post, part of a number of timbers representing a disjointed phase of land-ties [561]	P.Med
339	561	0	95/180	561	6	Timber	Timber post	1.54	0	Driven timber post, part of a number of timbers representing a disjointed phase of land-ties [561]	P.Med
340	561	0	95/185	561	6	Timber	Timber post	1.36	0	Driven timber post, part of a number of timbers representing a disjointed phase of land-ties [561]	P.Med
341	336	0	95/180	0	6	Timber	Tree	1.59	0	Tree apparently in situ, next to another tree, [336]	P.Med
342	561	0	95/180	561	6	Timber	Timber post	1.52	0	Driven timber post, part of a number of timbers representing a	P.Med

Context No	Plan No	Sect/elev No	GdSq	Structure No	Phase	Type	Description	High	Low	notes	Prov date
										disjointed phase of land-ties [561]	
343	561	0	95/180	561	6	Timber	Timber post	1.49	0	Driven timber post, part of a number of timbers representing a disjointed phase of land-ties [561]	P.Med
344	561	0	95/180	561	6	Timber	Timber post	1.42	0	Driven timber post, part of a number of timbers representing a disjointed phase of land-ties [561]	P.Med
345	561	0	95/180	561	6	Timber	Timber post	1.62	0	Driven timber post, part of a number of timbers representing a disjointed phase of land-ties [561]	P.Med
346	332	0	95/180	332	7b	Timber	Timber plank	1.38	0	Timber plank, part of revetment structure [332]	P.Med
347	347, 354	0	90/185, 95/180 95/185	347	7b	Timber	Timber revetment structure	1.86	0	Timber revetment structure composed of piles supporting planking, timbers [348], [350-354]. Represents the western half of a dock/inlet, the eastern side being structure [365]	P.Med
348	347	0	90/185, 95/180 95/185	347	7b	Timber	Timber plank	1.86	0	Timber plank, part of revetment structure [347]	P.Med
349	0	0	0	0	0	VOID	VOID	0	0	VOID	0
350	354	0	95/180 95/185	347	7b	Timber	Timber pile	1.84	0	Driven timber pile, part of revetment structure [347]	P.Med
351	354	0	95/185	347	7b	Timber	Timber pile	1.85	0	Driven timber pile, part of revetment structure [347]	P.Med
352	354	0	90/185	347	7b	Timber	Timber pile	1.86	0	Driven timber pile, part of revetment structure [347]	P.Med
353	354	0	90/185	347	7b	Timber	Timber pile	1.57	0	Driven timber pile, part of revetment structure [347]	P.Med
354	354	0	90/185	347	7b	Timber	Timber pile	1.5	0	Driven timber pile, part of revetment structure [347]	P.Med
355	0	0	0	0	8	Layer	Clay Layer	0	0	Clay alluvial layer which seals phase of timber land-ties [559]	P.Med
356	356, 357	204	95/190 100/190	356, 555	9	Timber	Timber structure	2.41	0	Timber revetment structure forming a river wall, including timbers [357-363]. Same as structure [555] to the west	P.Med
357	357	0	95/190	356	9	Timber	Timber post	2.36	0	Timber post, part of revetment structure [356]	P.Med
358	357	0	95/190	356	9	Timber	Timber post	2.35	0	Timber post, part of revetment structure [356]	P.Med
359	357	0	95/190 100/190	356	9	Timber	Timber post	2.36	0	Timber post, part of revetment structure [356]	P.Med
360	356	204	95/190 100/190	356	9	Timber	Timber plank	2.36	0	Timber plank, part of revetment structure [356]	P.Med
361	356	204	95/190 100/190	356	9	Timber	Timber plank	2.29	0	Timber plank, part of revetment structure [356]	P.Med
362	356	204	95/190	356	9	Timber	Timber plank	2.38	0	Timber plank, part of revetment structure [356]	P.Med
363	356	204	95/190 100/190	356	9	Timber	Timber beam	1.69	0	Timber beam, part of revetment structure [356]	P.Med
364	0	0	95/190	356	9	Fill	Backfill in revetment structure [356]	2.19	0	Backfill between planking [361] & [362] in revetment structure [356]	P.Med
365	365, 366	202	100/180 100/185	365	7b	Timber	Timber revetment	2.48	0	Timber revetment structure composed of piles supporting planking, timbers [366-393]. Represents the eastern half of a	P.Med

Context No	Plan No	Sect/elev No	GdSq	Structure No	Phase	Type	Description	High	Low	notes	Prov date
							structure			dock/inlet, the western side being structure [347]	
366	366	202	100/185	365	7b	Timber	Timber pile	2.05	0	Timber pile, part of revetment structure [365]	P.Med
367	366	202	100/185	365	7b	Timber	Timber pile	2.09	0	Timber pile, part of revetment structure [365]	P.Med
368	366	202	100/185	365	7b	Timber	Timber pile	2.08	0	Timber pile, part of revetment structure [365]	P.Med
369	366	202	100/185	365	7b	Timber	Timber pile	2.08	0	Timber pile, part of revetment structure [365]	P.Med
370	366	202	100/185	365	7b	Timber	Timber pile	2.33	0	Timber pile, part of revetment structure [365]	P.Med
371	366	202	100/185	365	7b	Timber	Timber pile	2.55	0	Timber pile, part of revetment structure [365]	P.Med
372	366	202	100/185	365	7b	Timber	Timber pile	2.25	0	Timber pile, part of revetment structure [365]	P.Med
373	366	202	100/185	365	7b	Timber	Timber pile	2.1	0	Timber pile, part of revetment structure [365]	P.Med
374	366	202	100/185	365	7b	Timber	Timber pile	2.48	0	Timber pile, part of revetment structure [365]	P.Med
375	366	202	100/185	365	7b	Timber	Timber pile	2.15	0	Timber pile, part of revetment structure [365]	P.Med
376	366	202	100/185	365	7b	Timber	Timber pile	2.26	0	Timber pile, part of revetment structure [365]	P.Med
377	366	202	100/185	365	7b	Timber	Timber pile	2.3	0	Timber pile, part of revetment structure [365]	P.Med
378	366	202	100/185	365	7b	Timber	Timber pile	2.02	0	Timber pile, part of revetment structure [365]	P.Med
379	366	202	100/185	365	7b	Timber	Timber pile	2.3	0	Timber pile, part of revetment structure [365]	P.Med
380	366	202	100/185	365	7b	Timber	Timber pile	2.3	0	Timber pile, part of revetment structure [365]	P.Med
381	366	202	100/185	365	7b	Timber	Timber pile	2.32	0	Timber pile, part of revetment structure [365]	P.Med
382	366	202	100/185	365	7b	Timber	Timber pile	2.3	0	Timber pile, part of revetment structure [365]	P.Med
383	366	202	100/185	365	7b	Timber	Timber pile	2.5	0	Timber pile, part of revetment structure [365]	P.Med
384	365	202	100/185	365	7b	Timber	Timber plank	2.07	0	Timber plank, part of revetment structure [365]	P.Med
385	365	202	100/185	365	7b	Timber	Timber beam	1.8	0	Timber beam, part of revetment structure [365]	P.Med
386	365	202	100/185	365	7b	Timber	Timber plank	2.23	2.14	Timber plank, part of revetment structure [365]	P.Med
387	365	202	100/185	365	7b	Timber	Timber beam	1.91	0	Timber beam, part of revetment structure [365]	P.Med
388	365	202	100/185	365	7b	Timber	Timber plank	2.13	1.91	Timber plank, part of revetment structure [365]	P.Med
389	365	202	100/185	365	7b	Timber	Timber pile	1.85	0	Timber pile, part of revetment structure [365]	P.Med
390	365	202	100/185	365	7b	Timber	Timber beam	1.76	0	Timber beam, part of revetment structure [365]	P.Med
391	365	202	100/185	365	7b	Timber	Timber beam	1.72	0	Timber beam, part of revetment structure [365]	P.Med
392	365	202	100/180 100/185	365	7b	Timber	Timber plank	1.87	0	Timber plank, part of revetment structure [365]	P.Med
393	365	202	100/180 100/185	365	7b	Timber	Timber beam	1.81	0	Timber beam, part of revetment structure [365]	P.Med
394	366	0	100/185	365	7b	Timber	Timber pile	2.26	0	Timber pile, part of revetment structure [365]	P.Med
395	557	0	90/180 95/180	557	6	Timber	Timber plank	1.98	0	Timber plank, part of revetment structure [557]	P.Med
396	354	0	90/185	347	7b	Timber	Timber pile	1.82	0	Timber pile, part of revetment structure [347]	P.Med

Context No	Plan No	Sect/elev No	GdSq	Structure No	Phase	Type	Description	High	Low	notes	Prov date
397	0	201	85/190	0	10	Fill	Backfill between revetment structures [555] & [556]	2.47	2.41	Backfill between revetment structures [555] & [556], excavated within a sondage	P.Med
398	0	201	85/190	0	10	Fill	Backfill between revetment structures [555] & [556]	2.18	2.09	Backfill between revetment structures [555] & [556], excavated within a sondage	P.Med
399	0	201	85/190	0	10	Fill	Backfill between revetment structures [555] & [556]	2.09	1.98	Backfill between revetment structures [555] & [556], excavated within a sondage	P.Med
400	0	201	85/190	0	10	Fill	Backfill between revetment structures [555] & [556]	1.94	1.75	Backfill between revetment structures [555] & [556], excavated within a sondage	P.Med
401	401	202	95/180 100/180 95/185 100/185 95/190 100/190	401	11	Timber	Timber structure	3.95	1.79	Large timber pile and plank revetment structure forming the western side of a dock/inlet. Illustrated on 1860 OS map	P.Med
402	285, 403	0	80/195 85/195 90/195 80/200 85/200 90/200	402	11	Timber	Timber structure	3.17	2.77	Timber revetment structure composed of timber piles and planks representing a small dock/inlet, illustrated on 1860s OS Map	P.Med
403	404	207	85/185	403	3	Timber	Wattle structure	1.57	1.31	Wattle fence/hurdle structure, directly associated with wattle fascines [404], part of late-med/early post-med clay bank river wall	l.Med/E.Post-med
404	404	207	85/185	404	3	Timber	Wattle structure	1.53	1.29	Wattle 'fascines' forming a mat, directly associated with wattle fence/hurdle [403], part of late-med/early post-med clay bank river wall	l.Med/E.Post-med
405	0	0	0	0	0	VOID	VOID	0	0	VOID	0
406	0	207	80/185 85/185 80/190 85/190	0	7c	Fill	Fill of ditch/channel [407]	1.71	0	Fill of ditch/channel [407], very high organic peat content	P.Med
407	407	207	80/185 85/185 80/190 85/190	0	7c	Cut	Ditch/channel	1.71	1.07	E-W running ditch/channel, filled with very high organic content peat material [406]	P.Med
408	408	209	80/190 90/190	0	8	Masonry	Brick wall	1.71	0.41	Brick river wall running E-W	P.Med
409	0	207	80/185 80/190 85/190	0	8	Fill	Backfill of construction cut [410]	1.54	0	Backfill of construction cut [410] for brick river wall [408]	P.Med

Context No	Plan No	Sect/elev No	GdSq	Structure No	Phase	Type	Description	High	Low	notes	Prov date
410	410	207	80/185 80/190 85/190	0	8	Cut	Construction cut for brick wall [408]	1.54	0	Construction cut for brick river wall [408], only recorded along one section of the wall	P.Med
411	0	0	90/180	0	2	Layer	Clay layer	0	0	Clay layer, not planned so no levels or dimensions, had frequent molluscs and so was sampled. May be an equivalent to [501] & [533]	L.Med/E.Post-med
412	412	207	80/180 85/180 90/180	412	4	Timber	Timber structure	2.28	1.38	E-W timber revetment composed of planks supported by piles. Represents a river wall	P.Med
413	0	0	0	0	0	VOID	VOID	0	0	VOID	0
414	0	0	0	0	0	VOID	VOID	0	0	VOID	0
415	0	0	0	0	12	Timber	Ships Timber	0	0	Apparent Ships timber,	0
416-475	0	0	0	0	0	VOID	VOID	0	0	VOID	0
476	476	0	80/190 85/190	476	2	Timber	Wattle structure	0.79	0.58	Wattle structure composed of 'fascines' and stakes, part of a late med/early post-med clay bank river wall	E.Med/L.Post-med
477	476	0	80/185	477	2	Timber	Wattle structure	0.91	0.75	Truncated wattle structure, associated with [476] and forming a late Med/early post-med clay bank river wall	L.Med/E.Post-med
478	0	0	80/185 80/190	0	2	Layer	Clay layer	0	0	Clay layer, Not planned so no dimensions or levels, may equate to clay layer [511]	L.Med/E.Post-med
479	479	207	80/180 85/180	479	2	Timber	Wattle structure	1.05	0.94	Wattle hurdle/fence structure, including stakes [480-483]. Part of Early med/late post-med clay bank river wall	L.Med/E.Post-med
480	479	0	80/185	479	2	Timber	Timber stake	1	0	Timber stake, part of wattle structure [479]	L.Med/E.Post-med
481	479	0	80/185	479	2	Timber	Timber stake	1.05	0	Timber stake, part of wattle structure [479]	L.Med/E.Post-med
482	479	0	80/185	479	2	Timber	Timber stake	1.03	0	Timber stake, part of wattle structure [479]	L.Med/E.Post-med
483	479	0	85/185	479	2	Timber	Timber stake	1.03	0	Timber stake, part of wattle structure [479]	L.Med/E.Post-med
484	484	0	80/185	484	2	Timber	Wattle structure	1.15	0.74	Disturbed wattle structure, part of early med/late post-med clay bank river wall	L.Med/E.Post-med
485	485	207	80/185 85/185	485	2	Timber	Wattle structure	1.17	1.03	Fragmentary remains of wattle hurdle/fence, part of late med/early post-med clay bank river wall	L.Med/E.Post-med
486	0	0	0	0	6	Timber	Tree	0	0	Apparently a tree. May refer to either trees [336] or [341]	P.Med
487	0	0	0	0	6	Timber	Tree	0	0	Apparently a tree. May refer to either trees [336] or [341]	P.Med
488	0	200	0	557	6	Timber	Timber plank	2	0	Timber plank, part of revetment structure [557]	P.Med

Context No	Plan No	Sect/elev No	GdSq	Structure No	Phase	Type	Description	High	Low	notes	Prov date
489	0	203	0	555	9	Timber	Timber beam	1.66	0	Timber beam, part of revetment structure [555]	P.Med
490	0	203	0	555	9	Timber	Timber plank	2.46	0	Timber plank, part of revetment structure [555]	P.Med
491	559	0	90/185	559	7c	Timber	Timber pile	1.87	0	Timber pile, part of land-tie structure [559]	P.Med
492	559	0	85/185	559	7c	Timber	Timber pile	1.69	0	Timber pile, part of land-tie structure [559]	P.Med
493	559	0	85/185	559	7c	Timber	Timber pile	1.92	0	Timber pile, part of land-tie structure [559]	P.Med
494	412	0	90/180	557	6	Timber	Timber pile	2.04	0	Timber pile, part of revetment structure [557]	P.Med
495	412	0	90/180	557	6	Timber	Timber pile	2.17	0	Timber pile, part of revetment structure [557]	P.Med
496	412	0	90/180	557	6	Timber	Timber pile	2.17	0	Timber pile, part of revetment structure [557]	P.Med
497	412	0	90/180	412	4	Timber	Timber pile	1.89	0	Timber pile, part of revetment structure [412]	P.Med
498	559	0	80/180 80/185	559	7c	Timber	Timber beam	1.82	1.39	Timber beam, part of land-tie structure [559]	P.Med
499	0	0	0	0	0	VOID	VOID	0	0	VOID	0
500	0	206	0	0	3	Layer	Clay layer	1.18	0	Extensive clay layer, part of clay bank river wall. Only recorded in section	P.Med
501	0	206	0	0	2	Layer	Clay layer	1.18	0.28	Clay layer, part of clay bank river wall. Only recorded in section	L.Med/E.Post-med
502	0	206	0	0	1	Layer	Natural Clay	-0.25	0	Natural alluvial clay layer, only recorded in section	Natural
503	0	206	0	0	1	Layer	Natural clay	-0.56	0	Natural alluvial clay layer, only recorded in section	Natural
504	0	207	0	0	3	Cut	Cut in section	1.6	1.21	Cut containing fill [505] which contained wattle fascines associated to same phase as wattle structures [403] & [404]. Only recorded in section	P.Med
505	0	207	0	0	3	Fill	Fill of [504]	1.6	0	Fill of [504] containing wattle fascines associated to same phase as wattle structures [403] & [404]. Only recorded in section	P.Med
506	0	0	0	0	0	VOID	VOID	0	0	VOID	0
507	0	207	0	0	2	Layer	Dump layer	1.16	0.91	Thin dump layer, part of clay bank river wall, may even represent a thin tread/trample layer. Only recorded in section	L.Med/E.Post-med
508	0	207	0	0	2	Layer	Clay layer	1.61	0	Clay layer, part of clay bank river wall. Only recorded in section	L.Med/E.Post-med
509	0	207	0	0	2	Layer	Clay layer	1.04	0.76	Clay layer, part of clay bank river wall. Only recorded in section	L.Med/E.Post-med
510	0	0	0	0	0	VOID	VOID	0	0	VOID	0
511	0	207	0	0	2	Layer	Clay layer	1.62	0	Clay layer, part of clay bank river wall. Only recorded in section	L.Med/E.Post-med

Context No	Plan No	Sect/elev No	GdSq	Structure No	Phase	Type	Description	High	Low	notes	Prov date
512	0	205	0	0	10	Fill	Fill of [513]	3.26	0	Fill of 19th century cut [514], only recorded in section	P.Med
513	0	205	0	0	10	Cut	Cut feature	3.26	2.48	19th century cut feature, a small area of which was only recorded in section	P.Med
514	0	205	0	0	7c	Fill	Fill of [516]	3.26	0	Fill of post-med cut feature [516], only recorded in section	P.Med
515	0	205	0	0	7c	Fill	Fill of [516]	3.11	2.28	Fill of post-med cut feature [516], only recorded in section	P.Med
516	0	205	0	0	7c	Cut	Post-med cut feature	3.26	2.18	Extensive post-medieval cut feature, only recorded in section. Appears to be a large landscaping cut through the clay layers which represented the clay bank river wall. May conversely be a series of layers dumped at the back of the clay bank levelling the ground.	P.Med
517	0	205	0	0	7c	Fill	Fill of [516]	2.61	2.18	Fill of post-med cut feature [516], only recorded in section	P.Med
518	0	205, 208	0	0	3	Layer	Clay layer	2.6	0	Extensive clay layer, part of clay bank river wall. Only recorded in section	P.Med
519	0	205	0	0	3	Layer	Dump layer	2.64	2.33	Thin dump layer, may represent a trample/tread deposit, part of clay bank river wall. Only recorded in section	P.Med
520	0	205	0	0	6	Layer	Clay layer	2.91	0	Clay dump layer. Only recorded in section	P.Med
521	0	205	0	0	3	Layer	Clay layer	2.4	2.34	Clay layer, part of clay bank river wall. Only recorded in section	P.Med
522	0	205	0	0	10	Cut	Extensive cut	2.98	2.58	Extensive 19th century levelling cut, only recorded in section	P.Med
523	0	205	0	0	10	Fill	Fill of [522]	2.91	0	Fill of 19th century levelling cut [522]. Only recorded in section	P.Med
524	0	205	0	0	8	Layer	Dump layer	2.75	0	Post-med dump layer. Only recorded in section	P.Med
525	0	205	0	0	10	Layer	Dump layer	3.1	0	Post-med dump layer, only recorded in section	P.Med
526	0	205	0	0	10	Fill	Fill of [527]	3.13	0	Fill of shallow cut [527], only recorded in section	P.Med
527	0	205	0	0	10	Cut	Shallow cut	3.13	2.92	Shallow 19th century cut feature, only recorded in section	P.Med
528	0	205	0	0	10	Fill	Fill of [529]	3.13	0	Fill of 19th century feature [529], only recorded in section	P.Med
529	0	205	0	0	10	Cut	19th century cut	3.13	2.58	19th century cut feature, only recorded in section	P.Med
530	0	205	0	0	10	Layer	Dump layer	3.09	0	19th century dump layer, only recorded in section	P.Med
531	0	205	0	0	10	Fill	Fill of [532]	3.09	0	Fill of 19th century feature [532], only recorded in section	P.Med
532	0	205	0	0	10	Cut	19th century feature	3.09	2.78	Small 19th century cut feature, only recorded in section	P.Med
533	0	207, 208	0	0	2	Layer	Clay layer	2.16	1.18	Clay layer, part of clay bank river wall, only recorded in section	L.Med/E.Post-med
534	0	208	0	0	3	Layer	Dump layer	2.15	1.88	Thin dump layer, possibly a tread/trample layer within clay bank river wall, only recorded in section	P.Med
535	0	208	0	0	3	Layer	Clay layer	2.14	0	Clay layer, part of clay bank river wall, only recorded in section	P.Med

Context No	Plan No	Sect/elev No	GdSq	Structure No	Phase	Type	Description	High	Low	notes	Prov date
536	0	205, 208	0	412	5	Cut	Construction cut for timber revetment [412]	2.56	1.46	Possible construction cut for timber revetment [412], only recorded in section	P.Med
537	0	205	0	412	5	Fill	Backfill of construction cut [536]	2.56	0	Backfill of possible construction cut [536] for timber revetment [412], only recorded in section	P.Med
538	0	208	0	557	6	Timber	Timber pile	2.26	0	Timber pile, part of revetment structure [557], only recorded in section	P.Med
539	0	208	0	0	8	Layer	Dump layer	2.62	0	Post-med dump layer, only recorded in section	P.Med
540	0	208	0	557	6	Cut	Construction cut for revetment structure [557]	2.63	1.13	Possible construction cut for timber revetment structure [557], only recorded in section	P.Med
541	0	0	0	0	0	VOID	VOID	0	0	VOID	0
542	0	208	0	0	8	Layer	Dump layer	2.55	0	late post-med dump layer, only recorded in section	P.Med
543	0	208	0	0	6	Layer	Dump layer	2.03	1.73	Dump layer, only recorded in section	P.Med
544	0	208	0	0	8	Layer	Dump layer	2.31	0	Late post-medieval dump layer, only recorded in section	P.Med
545	0	208	0	0	8	Layer	Dump layer	2.08	1.78	Late post-medieval dump layer, only recorded in section	P.Med
546	0	208	0	0	9	Fill	Fill of [547]	2.58	0	Fill of feature [547], contained frequent amounts of moderately sized chalk nodules, only recorded in section	P.Med
547	0	208	0	0	9	Cut	Post-med cut feature	2.58	1.83	Post-med cut feature, only recorded in section, fill [546] contained freq chalk nodules	P.Med
548	0	208	0	0	8	Layer	Dump layer	2.6	0	Late post-medieval dump layer, only recorded in section	P.Med
549	0	208	0	0	8	Layer	Dump layer	2.18	0	Late post-medieval dump layer, only recorded in section	P.Med
550	0	208	0	555	9	Cut	Construction cut for timber revetment [555]	2.65	1.5	Possible construction cut for timber revetment structure [555], only recorded in section	P.Med
551	0	205	0	0	10	Fill	Fill of [522]	2.98	0	Fill of levelling cut [522], only recorded in section	P.Med
552	552	207	80/180	552	2	Timber	Timber structure	1.21	0.69	Area of articulated boat timbers encountered in section. 2 uprights with planking fixed to both sides, the planking on the underside was contexted as [553]	P.Med
553	552	207	80/180	552	2	Timber	Timber structure	1.15	0	Planking on the udnerside of a section of articulated boat [552] encountered in section	P.Med
554	554	0	80/185	0	3	Timber	Timber group	3.17	2.82	Group of timber stakes, not given individual context numbers, most likely relate to wattle phase [403]/[404]	P.Med
555	555,356, 357	203, 204	80/190 85/190 90/190 95/190	555	9	Timber	Timber structure	2.61	1.5	E-W timber revetment structure composed of planking supported by piles, represents a post-med river wall	P.Med

Context No	Plan No	Sect/elev No	GdSq	Structure No	Phase	Type	Description	High	Low	notes	Prov date
			100/190								
556	556, 253	0	75/190 80/190 85/190 90/190 95/190 100/190	556	10	Timber	Timber structure	3.04	1.75	E-W timber revetment structure composed of planking supported by piles, represents a late post-med river wall	P.Med
557	557	200, 208	80/180 85/180 90/180 95/180	557	6	Timber	Timber structure	0	0	E-W timber revetment structure composed of piles supporting planking. Represents a post-med river wall.	P.Med
558	558	207	80/180 85/180 90/180 95/180	558	5	Timber	Timber structure	2.36	0	E-W timber revetment structure composed of piles supporting planking. Represents a post-med river wall.	P.Med
559	559	0	80/180 85/180 90/180 95/180 100/180 80/185 85/185 90/185 95/185 100/185 80/190 85/190 90/190 95/190 100/190	559	7c	Timber	Timber structure	2.43	1.18	Timber structure composed of numbers longitudinal timber beams parallel to one another which slope down from north to south with associated posts and lock-plates. These represent timber land-ties to a wholly truncated river wall.	P.Med
560	560	0	80/190 90/190	0	10	Timber	Timber group	3.12	2.71	Group of timber posts and planks between phases [555] & [556] of revetted river wall. May represent support for the later wall [556] or to make backfilling between the two to be easier *	P.Med
561	561	0	80/180 85/180 90/180 80/185 85/185 90/185 95/185	561	6	Timber	Timber group	1.62	0	Group of truncated timbers which appear to a be a phase of disturbed land-ties	P.Med
562	562	0	85/180	0	5	Timber	Timber beam	1.79	0	Timber beam below revetment structure [412] described by DMG as 15th century in character and must have retained a front brace.	P.Med
563	563	0	80/180 80/185 85/185	0	7d	Timber	Timber group	1.93	0	Group of anomalous timber which don't appear to relate to the numerous other timber structures in the area. They have therefore been grouped together.	P.Med
564	564	0	80/185 85/185	0	7c	Timber	Timber baseplate & post	1.86	1.64	Timber baseplate and associated upright which doesn't appear to relate to any other timbers. DMG thinks it relates to the driving of piles.	P.Med
565	0	0	80/175 85/175 80/180 85/180 80/185 85/185 80/190 85/190 95/190 80/195 85/195 95/195	565	12	Timber	Timber structure	3.06	2.8	Timber structure represented by a number timber trestle foundations, forming a late 19th century structure	P.Med

Context No	Plan No	Sect/elev No	GdSq	Structure No	Phase	Type	Description	High	Low	notes	Prov date
566	0	208	0	555	9	Fill	Backfill of construction cut [550]	2.65	0	Backfill of possible construction cut [550] for timber river wall structure [555], only recorded in section	P.Med
567	0	208	0	0	8	Layer	Dump layer	1.97	1.73	Post-med dump layer, only recorded in section	P.Med
568	568	0	90/180	568	7a	Timber	Structure	0	0	Group of disturbed timbers representing a phase of land-ties	P.Med
600	552	207	80/180	552	2	Timber	Timber pile	0	0	Timber pile, part of revetment structure [552]. Number assigned by DMG	P.Med
601	552	207	80/180	552	2	Timber	Timber plank	0	0	Timber plank, part of revetment structure [552]. Number assigned by DMG	P.Med
602	552	207	80/180	552	2	Timber	Timber plank	0	0	Timber plank, part of revetment structure [552]. Number assigned by DMG	P.Med
603	552	207	80/180	552	2	Timber	Timber plank	0	0	Timber plank, part of revetment structure [552]. Number assigned by DMG	P.Med
604	0	207	80/180	553	2	Timber	Timber plank	0	0	Timber plank, part of revetment structure [553]. Number assigned by DMG	P.Med
605	0	207	80/180	553	2	Timber	Timber plank	0	0	Timber plank, part of revetment structure [553]. Number assigned by DMG	P.Med
606	0	207	80/180	553	2	Timber	Timber plank	0	0	Timber plank, part of revetment structure [553]. Number assigned by DMG	P.Med
607	0	207	80/180	553	2	Timber	Timber plank	0	0	Timber plank, part of revetment structure [553]. Number assigned by DMG	P.Med

APPENDIX 10: OASIS FORM

OASIS ID: preconst1-70311

Project details

Project name	Land at Greenwich Reach, Thames Street, London Borough of Greenwich
Short description of the project	A single excavation area was open centred on a previous evaluation trench which recorded 19th century revetting. The excavation recorded multiple phases of river wall dating from the late 15th century to the 19th century. The first phases of river wall were clay banks defined by wattle fences. The later phases were mainly timber revetments but one river wall was constructed of brick. Two docks or revetted inlets were also revealed.
Project dates	Start: 20-01-2009 End: 25-03-2009
Previous/future work	Yes / No
Any associated project reference codes	GQR 06 - Sitecode
Type of project	Recording project
Site status	Local Authority Designated Archaeological Area
Current Land use	Industry and Commerce 4 - Storage and warehousing
Monument type	TIMBER REVETMENTS Post Medieval
Monument type	CLAY BANK RIVER WALL Post Medieval
Monument type	DOCKS Post Medieval
Monument type	WATTLE FENCES Post Medieval
Monument type	WATTLE 'FASCINES' Post Medieval
Significant Finds	POTTERY Post Medieval
Significant Finds	CLAY TOBACCO PIPE Post Medieval
Significant Finds	ANIMAL BONE Post Medieval
Investigation type	'Open-area excavation'
Prompt	Direction from Local Planning Authority - PPG16

Project location

Country	England
Site location	GREATER LONDON GREENWICH GREENWICH Greenwich Reach, Thames Street, London Borough of Greenwich
Postcode	SE10

Study area	1600.00 Square metres
Site coordinates	TQ 3788 7777 51.4815524935 -0.01414174003850 51 28 53 N 000 00 50 W Point
Height OD / Depth	Min: -0.25m Max: -0.25m

Project creators

Name of Organisation	Pre-Construct Archaeology Ltd
Project brief originator	CgMs Consultants Ltd
Project design originator	Duncan Hawkins
Project director/manager	Tim Bradley
Project supervisor	Neil Hawkins
Type of sponsor/funding body	Galliard Homes

Project archives

Physical Contents	'Animal Bones','Ceramics','Leather'
Digital Media available	'Database','Survey','Text'
Paper Media available	'Context sheet','Diary','Drawing','Map','Matrices','Photograph','Plan','Report','Section','Survey','Unpublished Text'

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	An Assessment of an Archaeological Excavation at Land at Greenwich Reach, Thames Street, London Borough of Greenwich, SE10
Author(s)/Editor(s)	Hawkins, N
Date	2010
Issuer or publisher	Pre-Construct Archaeology Ltd
Place of issue or publication	London

Entered by	Jon Butler (jbutler@pre-construct.com)
Entered on	25 January 2010

APPENDIX 11: AN ARCHAEOLOGICAL EVALUATION, EXCAVATION AND WATCHING BRIEF REPORT OF LAND AT 43-81 GREENWICH HIGH ROAD, LONDON BOROUGH OF GREENWICH, SE10

SITE CODE GHI 08

Neil Hawkins, Pre-Construct Archaeology Limited

Introduction

The following report details the working methods and results of an archaeological evaluation, excavation and watching brief of Land at 43-81 Greenwich High Road, London Borough of Greenwich SE10 (TQ 3760 7710) (Fig. 1). The site had previously been the subject of an Archaeological Desk Based Assessment (Page-Smith & Hawkins 2007) and a Building Recording report undertaken by Wessex Archaeology in April 2008 (see Appendix 12). An archaeological evaluation consisting of five trenches was undertaken by Wessex Archaeology Limited in June 2008. These works encountered archaeological remains most prominent of which was an 18th/19th century tannery. Subsequently an archaeological mitigation excavation was undertaken in August 2008, again by Wessex Archaeology Limited, in the location of the tanning complex (Fig. 2). An archaeological watching brief was then undertaken, between January and March 2009, by Pre-Construct Archaeology Ltd on ground reduction across the rest of the site (Fig. 3). The work was commissioned by Duncan Hawkins of CgMs Consulting on behalf of Galliard Homes. Tim Bradley of Pre-Construct Archaeology Ltd project managed the watching brief phase and Jon Butler managed the post-excavation phase of the report. The archaeological evaluation was supervised by Steve Thompson of Wessex Archaeology Limited and the excavation was supervised by Mike Dinwiddy also of Wessex Archaeology Limited. The evaluation and excavation were both project managed by Mark Williams of Wessex Archaeology Limited. The site was monitored by Mark Stevenson of English Heritage (Greater London Archaeological Advisory Service). The report was compiled and written by Neil Hawkins of Pre-Construct Archaeology Ltd.

The evaluation, excavation and watching brief encountered a sequence of natural Thames gravels overlain by alluvial deposits including organic peat horizons. These were sealed by post-medieval dumping into which a complex of tanning pits was cut. This tanning complex consisted of a total of twenty-eight tanning pits dating to the late 18th century before going out of use in the late 19th century. This tannery is illustrated on a number of maps of the period including the first edition Ordnance Survey Map of 1870. In the late 19th century the site was completely redeveloped with the construction of the Merryweather and Son's Tram Locomotive Works and Fire Fighting Equipment Factory.

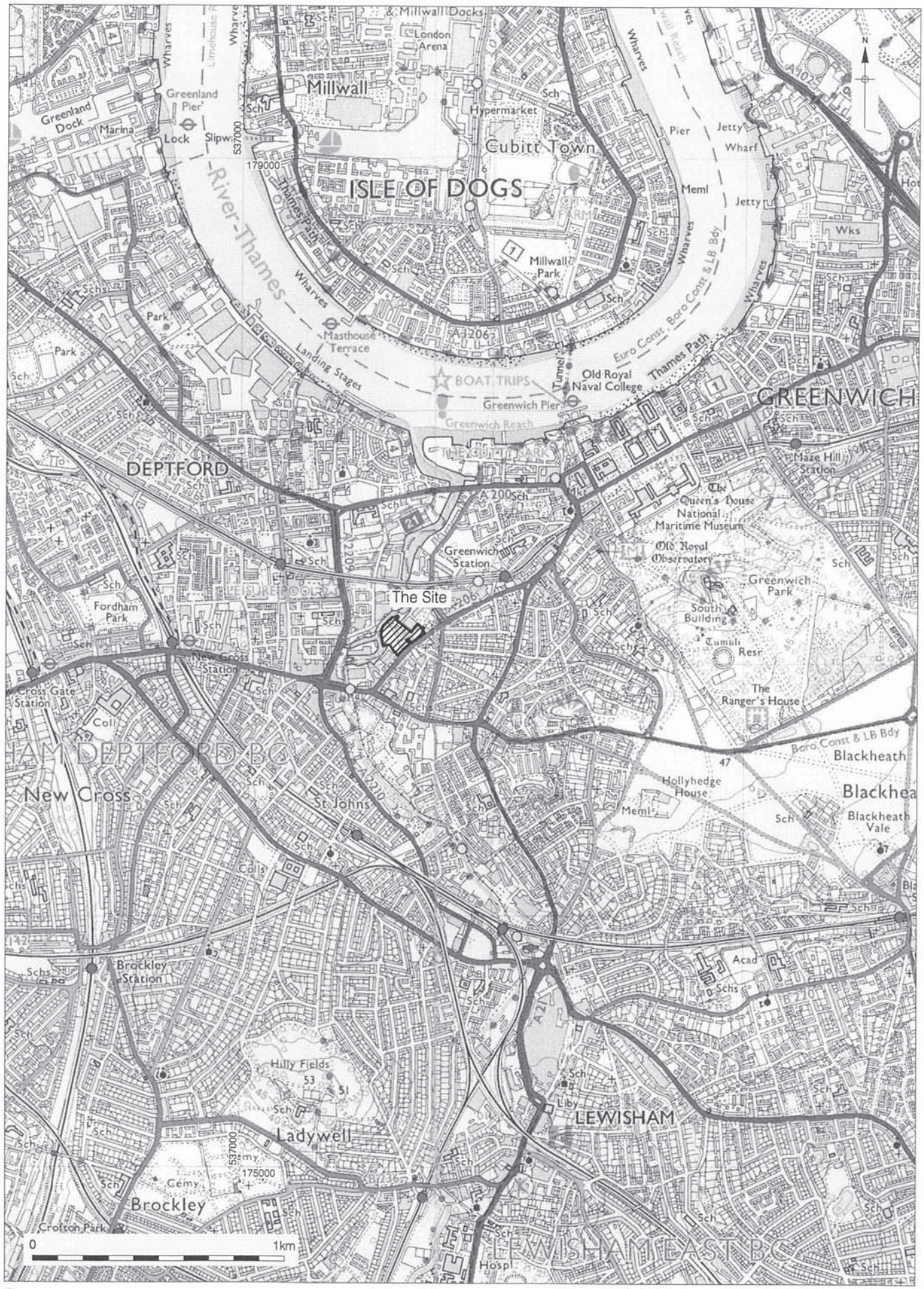

Figure 1
Site Location
1:20,000 at A4

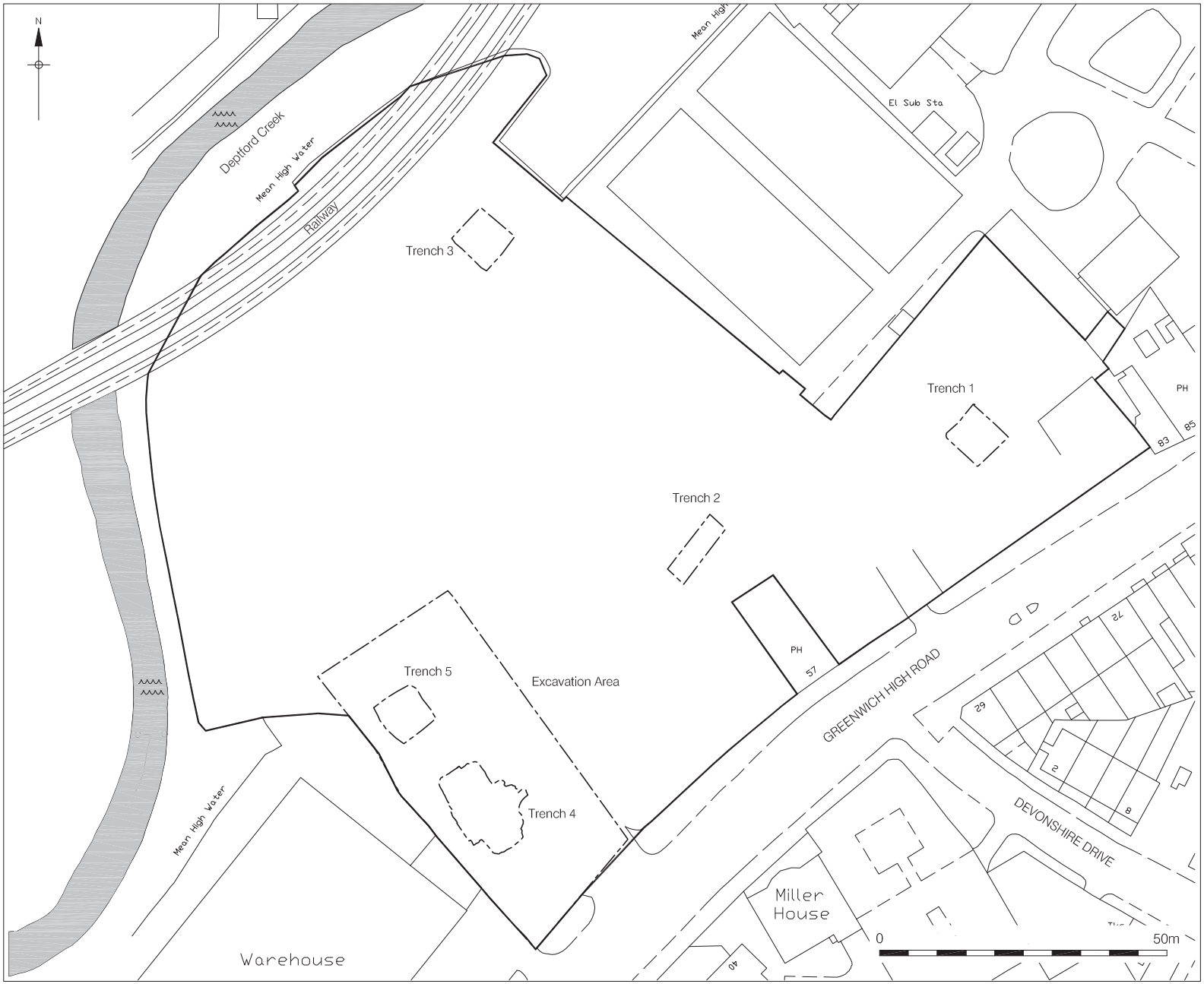

Figure 2
Trench and Excavation Area Location Plan
1:1,000 at A4

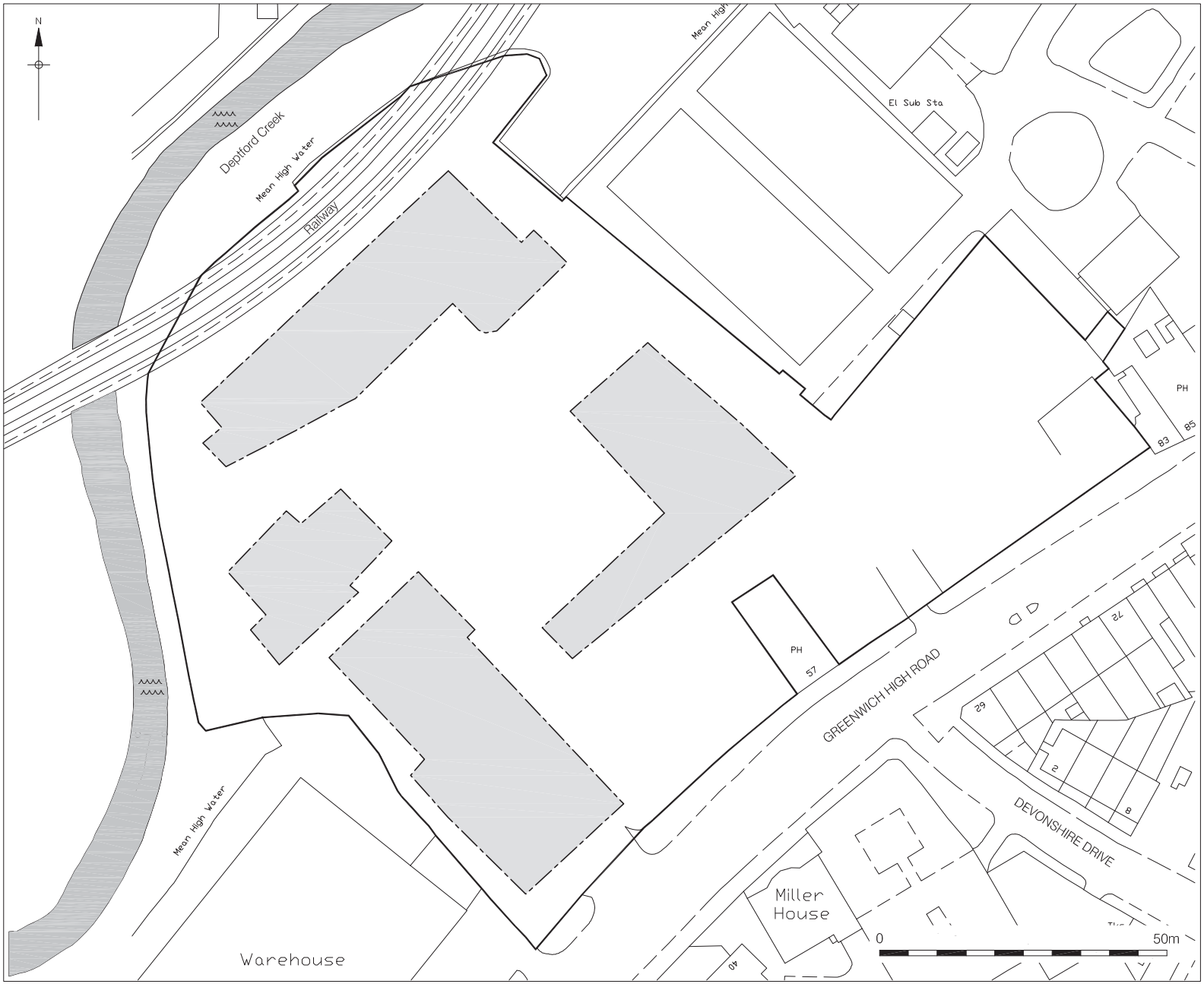

Figure 3
Watching Brief Location Plan
1:1,000 at A4

Site Location, Geology and Topography

The site was centred on NGR TQ 3760 7710. This comprised nos. 43-81 Greenwich High Road, London Borough of Greenwich SE10. The area of the site encompassed approximately 16,000 square metres. The site was assigned the unique site code GHI 08.

The site is bounded by Greenwich High Road to the south-east, a series of buildings associated with the sewage pumping works to the east and north-east, a warehouse to the south and Deptford Creek (the River Ravensbourne) to the north and west.

The underlying geology comprises of alluvial silts associated with Deptford Creek and the River Thames. These overlie gravels of the Kempton Park series, part of the Thames River Terrace Deposits (British Geological Survey Sheet 270 *South London*).

The site is generally flat; however recent demolition works have resulted in an undulating site situated between 3.5m and 4.5m OD.

Archaeological and Historical Background

A detailed archaeological and historical background to the site has been set out in an Archaeological Desk-based Assessment, prepared in October 2007 by CgMS Consulting Ltd. (Page-Smith & Hawkins 2007) and is summarised below.

Prehistoric

A number of prehistoric flint flakes and burnt flints have been recovered to the south and south west of the Site, as well as a possible hollow-way and burnt peat deposits. A single late Neolithic early Bronze Age struck flint and three Iron Age saddle querns, were identified from within pits on Deptford Broadway.

Romano-British

A number of Romano-British features and structures have been identified close by including a tessellated pavement and brick structure on Deptford High Street, and a number of 2nd century AD ditches and pits on Deptford Broadway. There is also the possibility that the

Southwark to Greenwich Roman road passes near the Site, though the exact location is unknown.

Saxon-Early Medieval

To the south of the Site around the Deptford Broadway area is considered to have been the focus of a settlement in the early to mid Saxon period, and that in the mid to late Saxon period the settlement shifted northwards around St. Nicholas Church in Deptford Green. Two inhumation burials dating to the 6th century were identified at Deptford Broadway between 1989 and 1992.

Later Medieval, Post-Medieval and Modern

Between AD 964 and 1414 Greenwich was a property of St. Peters Abbey Ghent and was administered from a manorial estate centre, potentially in the area now occupied by the Royal Naval College. The Domesday Book makes no mention of the manor though it was probably enlisted as an appendage of Lewisham. Barker (1983) stated the reference to thirty acres of meadow and the existence of eleven mills most likely relates to Greenwich and that these were possible situated along the Ravensbourne River of which Deptford Creek is a part.

In the late 1420's the manor of Greenwich was granted to Humphrey Duke of Gloucester, the youngest brother of Henry V and this association with the Crown saw the growth of Greenwich. Between 1432 and 1437 Duke Humphrey rebuilt the manorial complex at Greenwich with the construction of 'Manor of Plesaunce' or Bella Court' and following the passing of the manor to Queen Margret of Anjou the wife of Henry IV on the death of Humphrey, the manor was further expanded.

Henry VII between 1500 and 1504 rebuilt the manor house as Greenwich Palace and remained part of the royal demesnes until the death of Charles I in 1649, when it became the property of the State, only to return to the Crown with the Restoration of Charles II in 1660 and has remained so to this day.

During the later medieval and early post-medieval period the area of the site is believed to have been water meadows and marginal land, and in the later post-medieval period the site underwent considerable changes and existing cartographic evidence is able to provide a more detail summary of the history of the site.

Symondson's Map of Kent of 1596 depicts Greenwich as a substantial settlement with the eastern bank of Deptford Creek uninhabited, potentially a convention for agricultural land. John Rocque's Map of Greenwich 1745 shows a number of buildings fronting on to Greenwich High Road, with garden plots or market gardens extending to a boundary to the north and an area of meadows or marginal ground. Maps of 1769 and 1778, show further development but again concentrated towards Greenwich High Road with vacant land between it and the creek.

Between 1778 and 1830 considerable building work took place within the Site as the Greenwood map of 1830 shows a series of terraced buildings fronting on to the High Road annotated as Prospect Place, and a tannery complex which spans most of the site. Morris's Map of the Parish of St. Alphage of 1831 identifies the site as a Tan Yard, and the 1844 Greenwich Tithe Map also shows the layout of the tannery complex and the houses of Prospect Place and the 1870 Ordnance Survey (OS) map details the layout of the Tannery complex as unchanged as are the houses of Prospect Place.

In 1876 the Tannery was closed and the Merryweather and Son's Tram Locomotive Works and Fire Fighting Equipment Factory was established on the site, having moved from Lambeth to *'three acres of farmland with a 120 foot frontage along the Greenwich-Lewisham main road. Behind ran the river Ravensbourne giving shipping access to the Thames'* (Pitman 1981). The OS map of 1894 shows the complete redevelopment of the site, with all Tannery buildings either removed or incorporated into the new structures, with the terraced houses of Prospect Place still remaining.

All but two of the terraced houses were gone by the time of the 1916 OS map and replaced by large industrial structures; the two remaining terraced houses become the Rose of Denmark Public House. The 1934 OS map records the site as 'fire brigade works' and is relatively unchanged from 1916 though the western part of the site has been partially cleared to allow greater access for the tramway. In June 1944 the site was partially destroyed by a flying bomb as shown on the 1939-1945 Bomb Damage Map. Despite the bomb damage and subsequent rebuilding the site remained relatively unchanged on the 1952 OS map, though some major alterations have occurred, namely the extension of the tramway, now called *'the Tramway Maintenance Depot'* and the enlargement of the central area of the site. By 1958 the tramway had been removed a new warehouse and works building constructed, and the site is recorded as the same in 1970.

By 2006 the northern limits of the site have been encroached upon by the Docklands Light Railway (DLR) and several of the buildings have been removed and the area opened up slightly.

Methodology

A detailed account of the methodology was outlined in the Written Scheme of Investigation (Wessex Archaeology 2008) and is summarised below.

The evaluation consisted of five trenches (Fig. 2):

- Trench 1 measured 7.5m by 7.5m and was located in the eastern part of the site.
- Trench 2 measured 12m by 4m and was located in the southern central part of the site.
- Trench 3 measured 8m by 8m and was located in the northern part of the site.
- Trench 4 originally measured 14.3m by 4.5m and was expanded to form an area 17m max by 13m max. It was located in the southwestern corner of the site.
- Trench 5 measured 8m by 8m and was located in the southwestern corner of the site immediately to the northwest of Trench 4.

The excavation area was located in the southwestern corner of the site and was centred on Trenches 4 and 5. It measured a maximum of 60m by 27m.

The watching brief was conducted on four large areas located in the western and central parts of the site (Fig. 3)

The evaluation, excavation and watching brief was undertaken by mechanical excavator under archaeological supervision using a twenty ton 360^{o} tracked excavator. A breaker and toothed bucket were initially used to remove modern concrete intrusions. A flat-bladed ditching bucket was then used to remove the underlying overburden until archaeological horizons were encountered. At this point the trench was widened and stepped to create a safe working area.

Archaeological features and deposits were subsequently hand cleaned and sample excavated as outlined in the WSI. Features and deposits were recorded using *pro forma*

record sheets. Plans were drawn at a 1:20 scale and sections at 1:10. Single context recorded was utilised where appropriate. All principal strata and features were related to the Ordnance Survey datum. The trenches and excavation area were located using a Leica GPS survey system.

A photographic record of the evaluation was maintained, including black and white negatives (on 35mm film) and digital images. The photographic record illustrated both the detail and general context of the archaeological remains revealed, and the Site as a whole. Following all investigation and recording, the trench was backfilled.

The site archive was organised as to be compatible with its eventual deposition with the London Archaeological Archive and Research Centre (LAARC) at Eagle Wharf Road.

The site was allocated the unique site code of GHI 08.

The Archaeological Sequence

The archaeological sequence will be discussed by phase, encompassing the evaluation trenches, excavation area and watching brief.

Phase 1: Natural Thames Gravel

The earliest deposit recorded across the site was the natural terrace gravel. These gravels were recorded in evaluation Trench 1, context [120], at c. 0.90m OD. They were also recorded in the south of the excavation area, context [1051], at c. 2.70m OD.

Phase 2: Alluvial Deposits

The next phase of activity is represented by a sequence of naturally accumulated alluvial deposits. In evaluation Trench 1 a sequence of alluvial clays and gravels, [119], [118], [117], [116], [115] & [114], were recorded sealing the terrace gravel [120]. This sequence of alluvium was recorded at a highest level of c. 1.80m OD and had a combined thickness of 0.80m. A single sherd of Roman pottery was recovered from layer [116]. A single sherd of coarse London-type ware, dated to AD 1080-1200, was recovered from layer [115]. Three sherds of

pottery recovered from layer [114] were dated to AD 1580-1650. These pottery dates may reflect the period of accumulation of these alluvial layers, possibly occurring from the Roman period through to the 17th century. Palaoenvironmental samples recovered from alluvial deposit [116] contained the remains of charred cereals including rye, grains of oats, buttercup and rye-grass/darnel. These remains are consistent with general settlement refuse that includes cereal processing waste. The same palaeoenvironmental sample from alluvial layer [116] also recorded molluscs of open country dry ground species and fresh water species of slow moving riverine environments and still to stagnant water. This information illustrates the local area to be one of stagnant, still water and a slow moving riverine environment (see Environmental Report below).

The watching brief also encountered a series of alluvial deposits. This consisted of a sequence of organic peat deposits sealing a thick layer of alluvial clay. An extensive alluvial clay layer, [2003], was recorded throughout the watching brief areas. This deposit had a recorded thickness of 1.20m but continued below the excavated level. Sealing the alluvial clay [2003] were two distinct organic peat deposits, [2001] and [2002]. These deposits were 0.40m and 0.35m thick respectively. No anthropogenic material was recovered from this alluvial sequence. These various alluvial layers were recorded at a highest level of c. 1.90m OD and had a combined thickness of 1.95m. This alluvial sequence was consistent within the central and northwestern area of the watching brief.

Phase 3: Post-medieval Dumping & Ploughsoil

Sealing alluvial deposit [114] in evaluation Trench 1 was a layer of post-medieval made ground, [113]. Recorded at c. 1.82m OD this layer was 0.13m thick. This layer was sealed by a possible 'ploughsoil' deposit, [112]. This potential horticultural horizon was recorded at c. 1.93m OD and was 0.11m thick. No anthropogenic material was recovered from either of these deposits making dating them precisely problematic. They are however undoubtedly post-medieval in date and may reflect the land usage prior to the tannery occupying the site.

Phase 4: Late 18th to late 19th Century

Tanning Complex (Figs. 4 & 5)

Evaluation Trenches 4 & 5, located in the southern triangle of the site, encountered a complex of timber-lined tanning pits. Evaluation Trench 5 recorded nine of these timber-lined tanning pits, recorded as Pits A, B, C, D, E, F, G, H and I, with associated timber walkways running

alongside and between them. Walkways running northwest-southeast between the tanning pits were wider than those running northeast-southwest. The recorded area of these tanning pits was c. 7.30m northwest-southeast by c. 6.80m northeast-southwest and were encountered at c. 3.50m OD. Two of these pits, C and F, were excavated to investigate their nature. Evaluation Trench 4 also encountered timber-lined tanning pits. These were however left unexcavated and a subsequent open area excavation was undertaken in their location. Due to the more detailed recording undertaken during this open area excavation the archaeological sequence of these industrial features will be discussed using the information from this excavation phase. It is assumed that the construction process is virtually identical throughout the tanning complex. This tanning complex was recorded at c. 3.50m OD.

A total of twenty-eight timber-lined tanning pits and three associated northwest-southeast and nine northeast-southwest aligned timber walkways between them were recorded during the excavation. Three of these timber-lined pits, and their associated timber walkways were excavated, structures [1052], [1053] & [1054]. Timber-lined pit [1052] was located directly east of pit [1054] with [1053] located directly to the south. All the timber-lined pits were composed of a series of horizontal on-edge timber planks, one on top of another forming a box sunken into the ground. These were set slightly apart from each other with the gap between them being backfilled. In the area between timber-lined pits [1052] and [1053] a sequence of dumped deposits were recorded. The timber-lining of the two pits was initially coated with a thin bitumen layer. This was followed by a lining of clay c. 0.11m thick, deposit [1076] on structure [1052] and deposit [1075] on structure [1053]. The area between these two structures was backfilled by the sequence of dumped deposits, [1074], [1073], [1072] & [1071]. This sequence had a total thickness of c. 1.30m and consisted of a variety of clay and gravel layers. Recovered from backfill deposit [1072] was a small assemblage of pottery dated to 1760-1830 which gives an indication of when this layer was deposited. Bedded into backfilled deposit [1071] was a layer of cobbles [1070]. These cobbles may have formed an original phase of walkway between the tanning pits. In some areas of the tanning complex this cobble layer was replaced by a single course of bricks serving the same purpose. Sealing the cobble layer [1070] was a series of timber planks laid flat forming a walkway, [1027]. These planks ran longitudinal along the walkway. In some areas a second course of smaller timber planking survived running in the opposite direction to the original course, representing either a repair to the walkway or the original finish to it. This timber walkway ran northwest-southeast along the length of the tanning complex and was c. 0.90m wide. Between timber-lined pits [1053] and [1054] a single clay deposit, [1056], was recorded filling the entire area of the gap. This was again c. 1.30m thick. Sealing the backfilled clay [1056] was a single course of timber planks laid flat forming another, narrower, walkway [1057]. This timber walkway ran northeast-southwest through the tanning complex and was 0.44m wide.

The interior of the timber-lined tanning pits excavated appeared to be filled by very similar deposits. The three tanning pits [1052], [1053] and [1054] were filled by primary fills [1038], [1040] and [1055] respectively. These were overlain by secondary fills [1008], [1015] and [1014]. These fills were all very organic silts with very frequent wood chip inclusions. These deposits appear to represent the primary activity of the tanning process before going out of use. The depth of the tanning pits was c. 1.20m. The various other tanning pits which remained unexcavated were assigned fill numbers to their uppermost deposits which are equivalent to [1008], [1015] and [1014] described above.

The overall area of the tanning complex encountered during the excavation measured c. 15.80m northwest-southeast by c. 11.35m northeast-southwest. The tanning complex, the tops of the timber-lined pits and timber walkways, was recorded at c. 3.50m OD. Pottery recovered from the excavation suggests that it was in use from the late 18th century until the late 19th century.

Recorded cutting the natural gravel, [1051], in the southwest of the excavation area were two intercutting pits, [1045] & [1049]. Pit [1045] was sub-circular in shape measuring 1.60m northwest-southeast by 2.70m and was 0.67m deep. Pit [1049] truncated the southern end of [1045]. It was rectangular in shape, measuring 3.20m northeast-southwest by 0.80m and was 0.54m deep. Both these pits were recorded at c. 2.70m OD and may represent quarrying of the natural gravel.

Figure 4
Trench 4 and Southern Excavation Area
Phase 4: Late 18th - Late 19th century
1:100 at A4

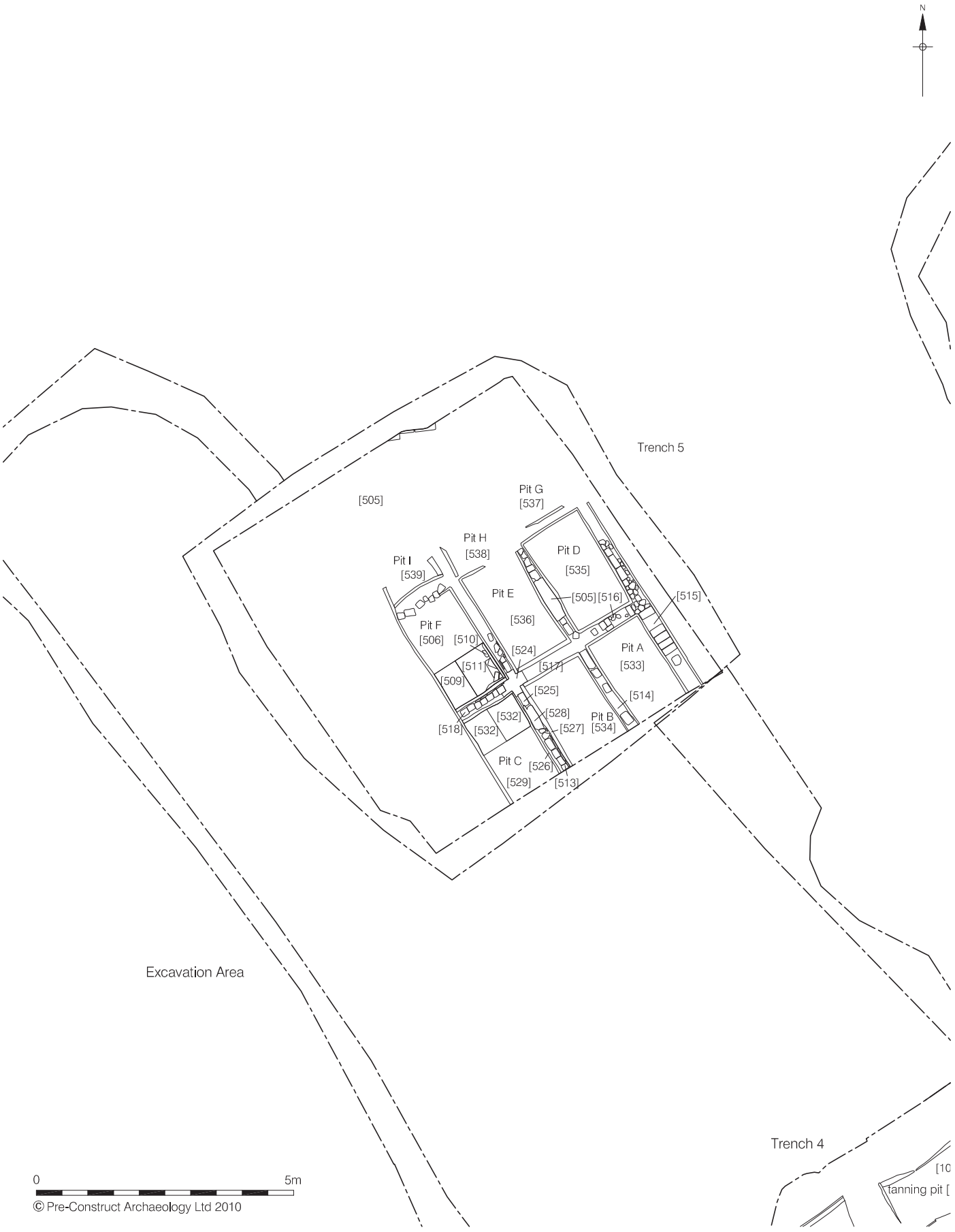

Figure 5
Trench 5
Phase 4: Late 18th - Late 19th century
1:100 at A4

Phase 5: Late 19th to Early 20th Century (Fig. 6)

Sealing demolition layer [111] in evaluation Trench 1 was a late 19th century brick culvert [109]. Associated with this culvert was a brick wall, [103]. Both these features ran northwest-southeast through evaluation Trench 1. Six courses of brick wall [103] survived to a depth of 0.65m. Brick culvert [109] was composed of a number of re-used bricks and had a depth of 0.32m. Both these features were recorded at c. 2.90m OD.

The earliest deposit recorded in evaluation Trench 2 was a sequence of made ground, [208] & [207]. These two made ground deposits were recorded at c. 2.50m OD and had a combined thickness of 0.70m. The earlier of these two deposits continued below the total depth of the evaluation trench. These dumped horizons most likely represent late 19th century levelling of the site.

Sealing the tanning pits in evaluation Trenches 4 & 5 were dumped deposits [404] and [505] respectively. Layer [404] was recorded at c. 3.60m OD and was 0.10m thick. Layer [505] was recorded at c. 3.65m OD and was 0.15m thick. Both these deposits represent activity post-dating the disuse of the tanning complex in the late 19th century.

Recorded in the excavation area was a layer of redeposited natural gravel, [1078], used as a levelling layer. Cutting this was a linear feature [1005]. Running north-south through the area it was 5.10m long by 0.55m wide and was 0.27m deep. The feature was filled by primary deposit [1046], composed primarily of moderately sized flint nodules, and by secondary fill [1006], a series of horn cores laid next to each other. This feature was recorded at c. 3.45m OD.

Also recorded in the excavation area was a small area of disturbed cobble surface, [1044]. This area of cobbles measured 2.30m by 0.80m and was 0.10m thick. Two bedding layers were recorded below the cobbles, [1043] & [1042], which had a combined thickness of 0.20m. This area of probable late 19th century cobbles was recorded at c. 3.37m OD.

Sealing the tanning pit complex revealed during the open excavation was a layer, [1007]. This deposit equates to [404] & [505] as recorded in evaluation Trenches 4 & 5. Again this deposit represents the activity post-dating the disuse of the tanning complex. A moderately sized assemblage of pottery was recovered from this layer which dated from 1825-1850 (See Pottery Report below).

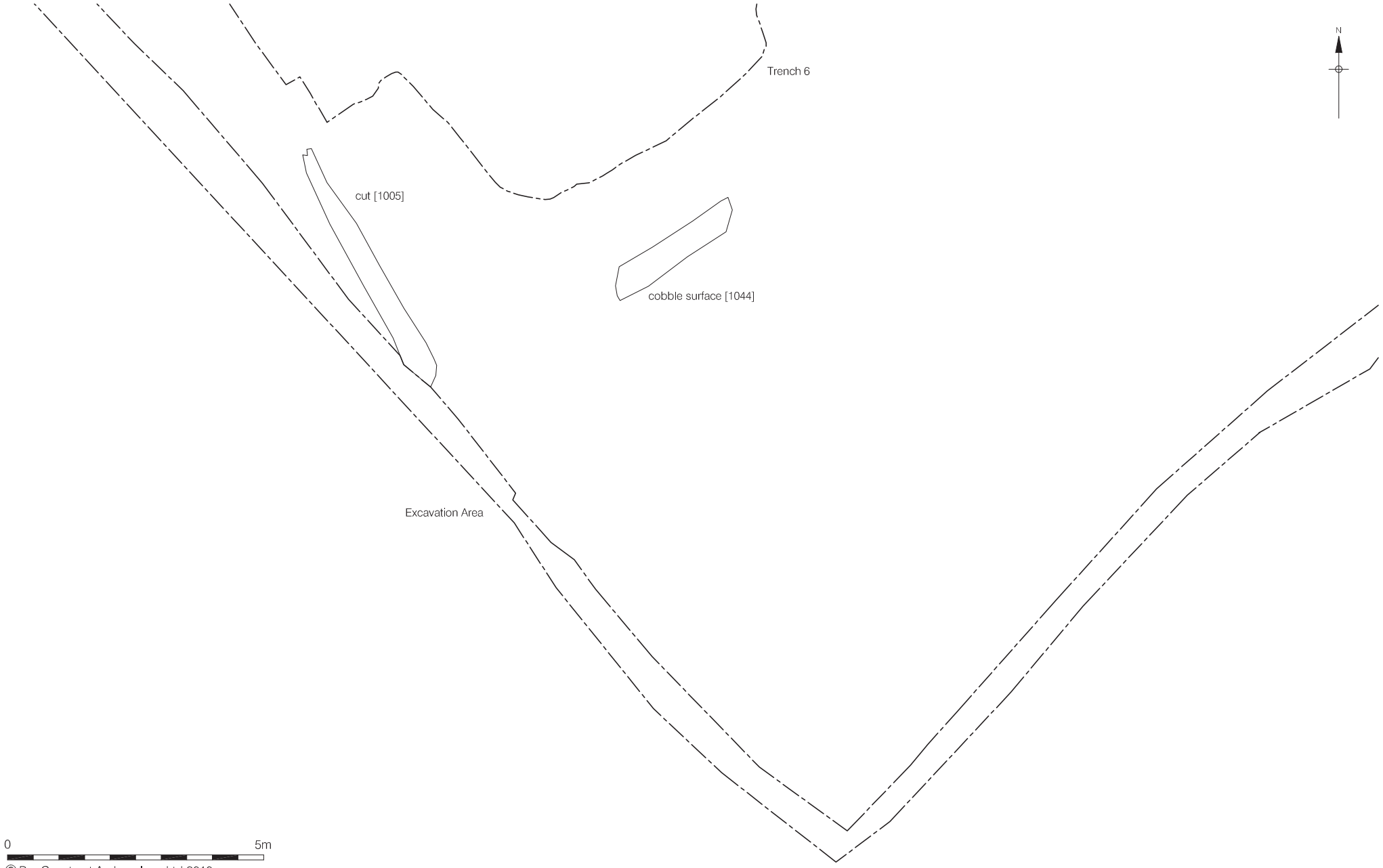

Figure 6
Southern Excavation Area
Phase 5: Late 19th - Early 20th century
1:100 at A4

Phase 6 - Modern

The archaeological sequence of evaluation Trench 1 was completed by a series of modern concrete footings, [106], [107] & [108], made ground, [104] & [102] and concrete, [101]. The highest level of this modern sequence was c. 3.40m OD, the modern ground level.

Sealing the late 19th century layer [207] in evaluation Trench 2 was a sequence of modern made ground and concrete, [206], [205], [204], [203], [202] & [201]. This sequence had a highest level of c. 4m OD and had a combined thickness of 1.10m.

Evaluation Trench 3 recorded only a sequence of modern activity. This consisted of a brick demolition layer sealed by a series of further demolition layers, [306], [305], [304], [303], [302], [301]. These modern deposits were recorded at c. 3.80m OD, the modern ground level, and had a maximum recorded depth of c. 2.30m thick but continued below the limit of the trench.

Sealing layer [404] in evaluation Trench 4 was a sequence of modern made ground overlain by concrete, [403], [402] & [401]. These deposits were recorded at a highest level of c. 4.30m OD, the modern ground level, and had a combined thickness of c0.70m.

Sealing layer [505] in evaluation Trench 5 was a similar sequence of modern made ground and concrete, [504], [503], [502], [501], to that recorded in evaluation Trench 4. These modern deposits were recorded at a highest level of 4.30m OD and had a combined thickness of 0.95m OD.

Sealing demolition layer [1002] in the southwestern area of the excavation was a sequence of modern made ground and concrete, [1001] & [1000]. This horizon of recent activity was recorded at c. 4.50m OD.

Discussion & Conclusions

Natural Thames gravels were recorded on the site consistent with the known underlying geology. A sequence of natural alluvial deposits was also recorded across the site, sealing the Thames gravels. This is unsurprising given the site's location next to Deptford Creek. The date of the deposition of these alluvial deposits cannot be accurately determined. The organic peat and alluvial clay recorded during the watching brief provided no anthropogenic material meaning that they remain undated. The alluvial clays recorded during the evaluation, in Trench 1, contained dateable pottery assemblages. However only a single sherd was recovered from some of these deposits and can therefore only be used to potentially indicate a date for deposition. A single sherd of Roman pottery was recovered from alluvial layer [116]. A single sherd of medieval pottery, dating to AD 1080-1200 was recovered from alluvial deposit [115] which sealed [116]. Alluvial deposit [114], which sealed [115], contained a small assemblage of three sherds of pottery dating to AD 1580-1650. This may indicate the date of deposition with the alluvium building up at various times from the Roman, medieval and through to the post-medieval period. As these pottery assemblages are so small though such a theory cannot definitively be proven.

Evidence of the land use in the post-medieval period was encountered within evaluation Trench 1. A dumped horizon was overlain by a possible 'ploughsoil', [112]. Despite being undated this horticultural horizon may reflect the usage of the land prior to more intense development in the 17th and 18th centuries. As no anthropogenic material was recovered from this deposit it cannot accurately be dated. However it seals a deposit from which pottery dating to AD 1580-1650 was recovered meaning that it post-dates this time period, most likely dating to the middle of the 17th century.

The most intense period of activity on site was associated with the tanning complex. A total of twenty eight timber lined tanning pits were recorded across the southern area of the site. Running alongside and between these tanning pits were associated timber walkways allowing access to and from these tan pits. This large tanning complex appears to have been in use from the late 18th century through until the late 19th century. Cartographic evidence illustrates the area of the site to be a tannery as early as 1830, annotated on the Greenwood map of 1830. The tannery continues to be illustrated on various later maps; Morris's Map of the Parish of St. Alphage 1831, the 1844 Greenwich Tithe Map and the first edition Ordnance Survey Map of 1870. The tannery was closed shortly after this in 1876. It made way for the construction of the Merryweather and Son's Tram Locomotive Works and Fire Fighting Equipment Factory. This is reflected on the second edition Ordnance Survey Map of 1894 which shows drastic change to the layout of the site following the construction of the factories.

The artefactual evidence relating to the tanning complex recovered from the evaluation and excavation match the cartographic and historical evidence. Pottery recovered from deposits relating to the construction of the tanning pits dates to the late 18th century. Pottery and clay tobacco pipes recovered from the fills of the tanning pits dates to 18th and 19th centuries. Pottery and clay tobacco pipe recovered from deposits which seal the tanning complex, and therefore post date the lifespan of the tannery, date from the mid to late 19th century. The animal bone assemblage is also indicative of waste from a tannery site. These were cattle horncores and skull fragments which would have been attached to the skins when they arrived and subsequently removed with the horns and horn sheaves being forwarded onto a hornworker (see Rielly, K. below).

Later 19th and early 20th century activity was also recorded across the site. This took the form of a number of dump and demolition layers relating to the redevelopment of the site in the late 19th century. The sparse remains of a cobble surface were also recorded representing an external surface. A thin, shallow gully was also recorded running through the site. This was unusually capped with deliberately placed horncores. These horncores most likely represent waste from the tannery complex after its lifespan which were at hand and used to line the gully. This gully may simply have been a drain which was capped with these horncores because they were readily available and at hand.

Recovered from one of the late 19th century dumped deposit was a number of whale bones, including a mandible. Several other whale bones have been found before along the Thames, usually they are from a Greenland Right Whale, which the whale bones recovered from site mostly likely represent. These whale bones illustrate the whaling industry of the 18th and 19th century from which baleen and oil, rendered from its blubber, was extracted.

The archaeological sequence was completed across the site by a variety of late 20th century dumped deposits, demolition layers and concrete bases associated with redevelopment of the site during the modern era.

Original Research Aims

The original research aims were laid out in the WSI of the Excavation (Wessex 2008):

To map the remains of the processes involved with the tanning process on the Site.

Twenty-eight tanning pits were recorded on the site. They were confined to the southwest corner of the site.

To confirm dating and processes associated with the tanning process.

To investigate variations in dating and processes across the Site.

The pottery recovered from the Site would suggest that the tanning activity was taking place during the late 18th century to early 19th century, which would seem to be confirmed by the available cartographic evidence. The presence of bark within the tanning pits and horncores in later features would suggest that tanning of cattle hides rather than tawing of other hides was being carried out on site. No variations in dating or processes was encountered on the Site.

To investigate structures associated with the tanning process which may be revealed during the excavation.

With the exception of the tanning pits no other structures associated with the tannery were revealed.

Contents Of The Archive

PAPER RECORDS

Context Sheets	155 sheets
Environmental Sample Sheets	3 sheets
Plans	8 sheets
Sections	11 sheets

THE FINDS

Pottery	1 box
Animal Bone	2 large boxes & 1 large fragment of whale bone
Building Material	1 large box
Clay Tobacco Pipe	1 box
Small Finds	24 objects
Environmental samples	3 bulk samples

PHOTOGRAPHS

35mm Black & White Prints	329 shots
Digital	117 shots

Recommendations for Further Work and Publication Outline

It is recommended that any further work concentrate on the tannery phase of the excavation. Further documentary sources, if available, should be consulted to determine the history of the tannery on the site and help determine the range of processes that were carried out on site. As evidence of tanning by-products was also found at Greenwich Reach it is evident that tanning was taking place in the Greenwich area and not confined to the major centre at Bermondsey. Further information regarding this local industry should be investigated. The bark samples should, if possible, be identified to species to help to determine the tanning processes involved.

It is proposed that a short publication report focusing on the Greenwich tanning industry be written and that it be incorporated into a larger report on the Greenwich Reach archaeological investigation which it is proposed to submit to Surrey Archaeological Collections.

Acknowledgements

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Post Roman Pottery Catalogue

Chris Jarrett

Unstratified

Black basalt stoneware with glaze (BBASG), 1770-1880, tea pot, 1 sherd, 1 MNV.

Surrey-Hampshire border whiteware with green glaze, (BORDG), 1550-1700, 1 sherd, 1 MNV.

Chinese blue and white porcelain, (CHPO BW), 1590-1900, dish, 1 sherd, 1 MNV.

Creamware with developed pale glaze, (CREA DEV), 1760-1830, 1 sherd, 1 MNV.

Creamware with developed pale glaze, (CREA DEV), 1760-1830, bowl; small rounded, 1 sherd, 1 MNV.

Creamware with developed pale glaze, (CREA DEV), 1760-1830, plate, 2 sherds, 1 MNV.

Metropolitan slipware, (METS), 1630-1700, dish, 1 sherd, 1 MNV.

London-area post-medieval redware, (PMR), 1580-1900, 1 sherd, 1 MNV.

London-area post-medieval redware, (PMR), 1580-1900, 1 sherd, 1 MNV.

London-area post-medieval redware, (PMR), 1580-1900, bowl; flared, 2 sherds, 1 MNV.

London-area post-medieval redware, (PMR), 1580-1900, bowl; rounded, 1 sherd, 1 MNV.

Slipped redware, (PMR SLIP), 1800-1900, dish, 2 sherds, 1 MNV.

Surrey-Hampshire border redware, (RBOR), 1550-1900, pipkin, 1 sherd, 1 MNV.

Plain refined white earthenware, (REFW), 1805-1900, 1 sherd, 1 MNV.

Plain refined white earthenware, (REFW), 1805-1900, plate; dinner, 2 sherds, 1 MNV.

Refined white earthenware with under-glaze painted decoration ('chrome colours'), (REFW CHROM), 1830-1900, 1 sherd, 1 MNV.

Sunderland-type coarseware, (SUND), 1800-1900, 1 sherd, 1 MNV.

Sunderland-type coarseware, (SUND), 1800-1900, bowl; rounded, 1 sherd, 1 MNV.

Transfer-printed refined whiteware, (TPW), 1780-1900, 1 sherd, 1 MNV.

Transfer-printed refined whiteware, (TPW), 1780-1900, dish; oval, 1 sherd, 1 MNV.

Transfer-printed refined whiteware, (TPW), 1780-1900, plate, 1 sherd, 1 MNV.

Context [104], spot date 1825-1900, nine sherds, seven MNV's.

English stoneware, (ENGS), 1700-1900, bottle; ink, 1 sherd, 1 MNV.

London-type ware drinking jug, (LOND DJ), 1270-1350, drinking jug; biconical, 1 sherd, 1 MNV.

Plain refined white earthenware, (REFW), 1805-1900, cup, 1 sherd, 1 MNV.

Refined white earthenware with under-glaze painted decoration ('chrome colours'), (REFW CHROM), 1830-1900, bowl; small carinated, 1 sherd, 2 MNV.

Refined white earthenware with sponged or spattered decoration, (REFW SPON), 1805-1900, bowl, 1 sherd, 1 MNV.

Transfer-printed refined whiteware, (TPW), 1780-1900, plate: dinner, 1 sherd, 2 MNV.

Transfer-printed refined whiteware with new colour decoration (type 4), (TPW4), 1825-1900, 1 sherd, 1 MNV.

Context [110], spot date 1805-1840, 4 sherds, 4 MNV's

Pearlware with under-glaze transfer-printed decoration, (PEAR TR), 1770-1840, plate: dinner, 1 sherd, 1 MNV.

Plain refined white earthenware, (REFW), 1805-1900, jar; cylindrical, 1 sherd, 1 MNV.

Refined white earthenware with sponged or spattered decoration, (REFW SPON), 1805-1900, bowl; small rounded, 1 sherd, 1 MNV.

Transfer-printed refined whiteware, (TPW), 1780-1900, plate: dinner, 1 sherd, 1 MNV.

Context [111], spot date 1650-1800, 2 sherds, 2 MNV's

London-area post-medieval redware, (PMR), 1580- 1900, paint pot, 1 sherd, 1 MNV.

Staffordshire-type coarse earthenware, (STCO), 1650- 1800, 1 sherd, 1 MNV.

Context [114], spot date 1580-1650, 3 sherds, 3 MNV's

London-area post-medieval redware, (PMR), 1 sherd, 1 MNV, 1580-1900.

London-area post-medieval slip-decorated redware, (PMSL), 1480- 1600, 1 sherd, 1 MNV.

London-area post-medieval slipped redware with clear (yellow) glaze, (PMSRY), 1480- 1650, 1 sherd, 1 MNV.

Context [115], spot date 1080-1200, 1 sherd, 1 MNV

Coarse London-type ware, (LCOAR), 1080-1200, 1 sherd, 1 MNV.

Context [116], spot date 0-400, 1 sherd, 1 MNV.

116, 50-400, Roman, (RPOT), 1 sherd, 1 MNV.

Context [505], spot date 1580-1900, 1 sherd, 1 MNV

London-area post-medieval redware, (PMR), 1580-1900, 1 sherd, 1 MNV.

Context [506], spot date 1825-1900, 3 sherds, 3 MNV's

London stoneware, (LONS), 1670-1926, jug, 1 sherd, 1 MNV.

London-area post-medieval redware, (PMR), 1580-1900, sugar cone mould?, 1 sherd, 1 MNV.

Transfer-printed refined whiteware with new colour decoration (type 4), (TPW4), 1825-1900, plate, 1 sherd, 1 MNV.

Context [507], spot date 1480-1750, 1 sherd, 1 MNV.

Midlands purple ware, (MPUR), 1480- 1750, 1 sherd, 1 MNV.

Context [508], spot date: 1480-1550, 1 sherd, 1 MNV

Cheam redware (CHEAR), 1480-1550, 1 sherd, 1 MNV.

Context [529], spot date: 19th century, five sherds, 5 MNV's

Ceramic building material (CBM), post-medieval, roof tile/kiln furniture, 1 sherd, 1 MNV.

Continental porcelain, (CONP), 1710-1900, bowl; rounded, 1 sherd, 1 MNV.

Creamware with developed pale glaze, (CREA DEV), 1760-1830, 1 sherd, 1 MNV.

Pearlware with under-glaze blue painted decoration, (PEAR BW), 1770-1820, chamber pot, 1 sherd, 1 MNV.

London-area post-medieval redware, (PMR), 1580-1900, sugar mould, 1 sherd, 1 MNV.

Context [531], spot date 1480-1750, 1 sherd, 1 MNV

London-area post-medieval redware, (PMR), 1580-1900, bowl or dish, 1 sherd, 1 MNV

Context [534], spot date 1730-1830, 3 sherds, 3 MNV

Creamware with developed pale glaze (CREA DEV), 1760-1830, bowl; medium rounded, 1 sherd, 1 MNV.

London stoneware (LONS), 1670-1926, 1 sherd, 1 MNV.

London-area post-medieval redware (PMR), 1580-1900, flower pot, 1 sherd, 1 MNV.

Context [535], spot date 1760-1830, 5 sherds, 5 MNV's

Creamware with developed pale glaze (CREA DEV), 1760-1830, plate: dinner, 1 sherd, 1 MNV.

London-area post-medieval redware (PMR), 1580-1900, Jar, 4 sherds, 3 MNV.

Context [539], spot date 1580-1900, 1 sherd, 1 MNV

London-area post-medieval redware (PMR), 1580-1900, 1 sherd, 1 MNV.

Context [1007], spot date 1825-1850, 52 sherds, 36 MNV's

Creamware with slip decoration (CREA SLIP), 1775-1830, bowl; rounded, 1 sherd, 1 MNV.

London stoneware (LONS), 1670-1926, 1 sherd, 1 MNV.

London stoneware (LONS), 1670-1926, bottle; wide, 1 sherd, 2 MNV.

Pearlware (PEAR), 1770-1840 4 sherds, 5 MNV.

Pearlware (PEAR), 1770-1840, bowl or dish, 1 sherd, 1 MNV.

Pearlware (PEAR), 1770-1840, chamber pot, 1 sherd, 1 MNV.

Pearlware (PEAR), 1770-1840, jug: barrel shape, 1 sherd, 2 MNV.

Pearlware with under-glaze blue painted decoration (PEAR BW), 1770-1820, Plate: dinner, 1 sherd, 1 MNV.

Pearlware with under-glaze polychrome painted decoration (PEAR ERTH), 1790-1820, 1 sherd, 1 MNV.

Pearlware with under-glaze transfer-printed decoration (PEAR TR), 1770-1840, dish oval, 1 sherd, 2 MNV.

Pearlware with under-glaze transfer-printed decoration (PEAR TR), 1770-1840, plate, 1 sherd, 1 MNV.

Pearlware with under-glaze transfer-printed decoration (PEAR TR), 1770-1840, plate: dinner, 2 sherds, 2 MNV's.

Pearlware with under-glaze transfer-printed decoration (PEAR TR), 1770-1840, plate; large, 1 sherd, 1 MNV's.

London-area post-medieval redware (PMR), 1580-1900, 6 sherds, 6 MNV's.

London-area post-medieval redware (PMR), 1580-1900, bowl; deep flared, 1 sherd, 1 MNV.

London-area post-medieval redware (PMR), 1580-1900, bowl or dish, 1 sherd, 1 MNV.

London-area post-medieval redware (PMR), 1580-1900, chamber pot, 1 sherd, 1 MNV.

London-area post-medieval redware (PMR), 1580-1900, flower pot, 1 sherd, 1 MNV.

London-area post-medieval slipped redware with clear (yellow) glaze (PMSRY), 1480-1650, bowl or dish, 1 sherd, 1 MNV.

Surrey-Hampshire border redware (RBOR), 1550-1900, chamber pot, 1 sherd, 1 MNV.

Refined red earthenware (REFR), 1740-1800, tea pot, 1 sherd, 1 MNV.

Plain refined white earthenware (REFW), 1805-1900, 1 sherd, 1 MNV.

Plain refined white earthenware (REFW), 1805-1900, jug, 1 sherd, 1 MNV.

Sunderland coarse ware with mottled glaze (SUND MOT), 1775-1850, bowl, 1 sherd, 1 MNV.

White salt-glazed stoneware (SWSG), 1720-1780, bowl; medium rounded, 1 sherd, 1 MNV.

White salt-glazed stoneware (SWSG), 1720-1780, plate: dinner, 1 sherd, 1 MNV.

Transfer-printed refined whiteware (TPW), 1780-1900, 1 sherd, 1 MNV.

Transfer-printed refined whiteware with new colour decoration (type 4) (TPW4), 1825-1900, jug: cream, 1 sherd, 2 MNV's.

Context [1072], spot date 1760-1830, 2 sherds, 2 MNV's

Creamware with developed pale glaze (CREA DEV), 1760-1830, dish, 1 sherd, 1 MNV.

London-area post-medieval redware (PMR), 1580-1900, 1 sherd, 1 MNV.

Significance, potential and recommendations for further work

The pottery has little significance at a local level. The sherds of sugar cone mould found in contexts [506] and [529] may be from a local sugar house or a waster from a Greenwich or Deptford redware pot house. The roof tile used as kiln furniture, as found in context [529] also reflects the local pottery making industry. The only potential of the pottery is to date the features it was recovered from. No items require illustration. There are no recommendations for further work on the assemblage.

Clay Tobacco Pipe Catalogue

Chris Jarrett

Unstratified, eight fragments

AO28, 1820-60, one bowl with oak leaf borders on the front and back of the bowl, maker marked * G.

Stems, eleven fragments

Context [110], spot date 19th century, seven fragments.

Only stems present of a 19th century date.

Context [111], spot date 19th century, four fragments.

Only stems present of a 19th century date.

Context [506], spot date: 18th-19th century, one fragment.

Only a stem present of a 18th-19th century date.

Context [508], spot date: 18th-19th century, one fragment.

Only a stem present of a 18th-19th century date.

Context [529], spot date: late 18th-19th century, three fragments.

Two stems

One stem with relief moulded decoration dated to the late 18th-19th century.

OS10 bowl, 1700-1740, marked IC on the heel. I C: a number of possible makers, none known to be local. See Oswald 1975, 133.

Context [539], spot date: 1840-1880, two fragments.

One stem.

AO29, 1840-1880, one bowl decorated with oak leaf borders, rectangles and line borders around the rim and bosses on the body. Evidence of a horizontal bar acting as a foot.

Context [1048], spot date: 1700-1740, four fragments.

Three stems.

OS10, 1700-1740, one bowl, marked on the heel I ?P. family name initial has been recut in the mould, possibly over a letter A.

Context [1072], spot date: 1580-1740, one fragment.

One thick stem of a *c.*1580-1740 date.

Context [1007], spot date: 1850-1910, seventeen fragments.

Fifteen stems

AO28: 1820-1860, one bowl with a damaged spur. Marked J with the family name missing.

AO30: 1850-1910, one bowl, damaged. Rib on the back of the bowl and strap like leaves around the base.

Significance, potential and recommendations for further work

The clay tobacco pipes have little significance at a local level. The only potential of the clay tobacco pipes is to date the features they was recovered from. No items require illustration. There are no recommendations for further work on the assemblage.

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Building Material Assessment

Dr Kevin Hayward

Introduction and Aims

One large box of ceramic building material (8 contexts), was retained at excavation from the site of 43-81 Greenwich High Road GHI08.

This small assemblage (38 examples 4kg) was assessed in order to:

- Identify (under binocular microscope) the fabric and form of the ceramic building material in order to identify any material that may date to the main Late 18th and 19th century occupation of the site (and indeed) before.

Methodology

The building material was examined using the London system of classification with a fabric number allocated to each object. The application of a 1kg mason's hammer and sharp chisel to each example ensured that a small fresh fabric surface was exposed. The fabric was examined at x20 magnification using a long arm stereomicroscope or hand lens (Gowland x10).

Ceramic Building Material

All of the material is post-medieval.

Post Medieval

e) Brick

Fabric *3032;* post Great Fire Clinker Brick

Fabric *3033; 3046* (1450-1700)

Tiny fragments (8 examples – 242g) of mauve brick with clinker inclusions (1666-1900) were retained from the fill of post-medieval and 19th century tanning pits [529] [534] [1048]. This fabric is consistent with the later post-medieval occupation of the site.

Likewise tiny fragments of earlier post-medieval red brick *3033* and *3046* were retained from the fill of 19th century pits [1048].

f) Peg Tile

Fabrics *2271; 2276; 2586*

Small quantities (17 fragments – 1.3kg) of post-medieval fine moulded sand broken peg tile, some of with evidence of black glazed blobs indicative of kiln firing [529] in the vicinity. Their form and fabric are consistent with later post-medieval occupation of the site.

g) Pan Tile

Fabrics *2279; 3090; PKE992*

A few examples (6 – 1.2kg) of broken pan tile (1630-1850) were identified – again their form and fabric consistent with later post-medieval occupation of the site. Of note is the rare silty fabric (PKE992) containing inclusions of blocked silt 15mm and red iron oxide.

h) Plaster

Fabric *3100*

A single example of white plaster was identified from a voided context [1003]. This is typical of 18th century and 19th century use.

i) Drain Pipe

Fabric 3261

Glazed Victorian Drain pipes (1.4kg) of a variety of kiln brick fabrics were identified from unstratified contexts.

No further comment is necessary.

Stone

3115 North Wales Slate – Palaeozoic

A fragment of roofing slate was identified [1007] from a post-medieval occupation layer. North Wales slate was a common roofing material during the 18th and 19th century.

Distribution

Context	Fabric	Form	Size	Date range of material		Latest dated material		Spot date
0	3261	Drain Pipes Glazed Victorian	5	1800	1950	1800	1950	1850-1900
111	2586	Peg Tile	1	1180	1800	1180	1800	1600-1800
114	2276	Peg Tile	1	1480	1900	1480	1900	1600-1900
505	2279	Pan Tile	1	1630	1850	1630	1850	1630-1850
529	3032	Post Medieval	14	1180	1900	1664	1900	1750-1900

Context	Fabric	Form	Size	Date range of material		Latest dated material		Spot date
	2271 2276 2279 2586 PKE992	post Great Fire Brick, peg tile, pan tile						
534	3032	Post Great Fire Brick	1	1664	1900	1664	1900	1700-1900
1003	3100 2276 3032 3046	Post Medieval red and post great fire bricks peg tile and plaster	5	1480	1900	1664	1900	1700-1900
1007	3115 2586 2279 2271	Post medieval peg and pan tile, Roofing slate	7	1180	1850	1664	1850	1630-1850
1048	3032 3033 2271	Post medieval brick red and post great fire and peg tile	6	1180	1900	1664	1900	1700-1900

Summary

- The assemblage is dominated by an unremarkable intermixed post-medieval assemblage of peg tile, pan tile, brick, plaster and stone.
- A couple of peg tiles have been glazed attesting to 17-19th century kiln firing – a feature more evident in the Greenwich Reach site (GQR 06).
- The brick, peg and pan tile fabrics are similar to the Greenwich Reach site (GQR 06).

Recommendations

- The assemblage has little chronological and fabric value and I would recommend that this assemblage should be discarded in its entirety. No further work is required.

The Metal And Small Finds

Märit Gaimster

Around fifty metal and small finds were retrieved from the excavation; they are listed in the table below. The vast majority consisted of iron nails and fragments from the Phase 4 tanning pits and later demolition layers. Other finds from the late 18th- to late 19th-century tanning complex include a length of loosely twined string (sf 17), the base of a small circular tin (sf 14), part of a hand-blown glass window pane (sf 15) and the needle of a bone syringe (sf 18). A complete bone toothbrush (sf 24) came from overlying demolition layers. A potentially interesting find is the cast handle and blade fragment of a possible late 16th-century one-piece iron knife (sf 23). Knives of his type are thought to represent *memento mori* gifts (Brown 2001, 75 no. 29; cf. Egan 2005, fig. 74). The two pieces were retrieved from the alluvial Phase 2 deposits, thought to have accumulated from the Roman period and through to the 17th century.

Recommendations

The metal and small finds form an integral part of the material recovered during excavation and should, where relevant, be included in any further publication of the site. For the finds from Greenwich High Road it is recommended that the bone toothbrush (sf 24), the incomplete bone syringe (sf 18) and the possible 16th-century knife are considered. No further work is required for the remaining finds; the unstratified nails may be discarded before the site is archived.

References

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P. Brown (ed.), 2001. *British Cutlery. An illustrated history of design, evolution and use*. York Civic Trust

UNSTRATIFIED				
context	sf	description	pot date	recommendation
0	21	a dozen iron nails and spikes		
	22	copper-alloy ring; complete flat-sectioned; diam. 22mm		
PHASE 2				
context	sf	description	pot date	recommendation
116	23	iron pin/handle with tapering circular-section body with moulded end; L 110mm+; fragment of iron knife blade; W 9mm; possibly the remains of a late 16th-century one-piece iron knife	Roman	further id
	23			
PHASE 4				
context	sf	description	pot date	recommendation
506	7	iron nail; incomplete	1825-1900	
	8	iron fitting; incomplete; rectangular-section strap widening towards one end; L 70mm+; W 7mm		
	9	iron nail; incomplete		
	10	iron nail; incomplete		
507	3	iron nail; incomplete	1480-1750	
	4	iron nail; incomplete		
508	2	iron nail; complete; L 75mm	1480-1550	
529	5	iron nail; L 105mm	19th century	
	6	iron nail; L 90mm+		
539	1	iron flat-section fitting; incomplete; tapering strap widening at both ends; L 80mm+; W 10mm	1580-1900	
1028	19	substantial iron pin; L 280mm	n/a	
1038	16	iron strap/binding; incomplete; W 32mm; L 220mm+	n/a	
	17	central piece of hand-blown glass window pane with pontil scar		
	17	length of loosely double-twined string; L 53mm+; diam.6mm		
1040	14	base of small circular metal tin; diam. 53mm; ht. 13mm	n/a	
1048	18	bone syringe; needle only; L 75mm+	n/a	
PHASE 5				
context	sf	description	pot date	recommendation
1007	20	iron nails and spikes; numerous	1825-1850	
	24	bone toothbrush; complete with four rows of holes for bristles; straight head and handle with oval ends and slightly narrowed short neck		

METAL AND SMALL FINDS FROM 43–81 GREENWICH HIGH ROAD

Animal Bone Assessment

Kevin Rielly

Introduction

The two excavations at this site, including the evaluation, revealed the remains of a quite extensive tanning complex comprising 28 tanpits and associated wooden walkways. The lower fills of the excavated tanpits contained copious quantities of bark fragments, suggesting its use as a tanyard rather than a tawyard i.e. a business involved in the preparation of cattle hides (heavy leather industry) rather than smaller skins as those from sheep or goat (light leather industry). It would appear that the yard was in operation between the late 18th and late 19th centuries. There was no sign of any pre-tanyard development/occupation, while the various dump deposits overlying the tannery tend to confirm the closure date with the presence of pottery types ranging in date from 1825 to 1900.

The excavation was undertaken by Wessex Archaeology and the small collection of bones recovered from this site (a total of 36 fragments) was initially described by Grimm (2009). All of the bones were recovered by hand.

Methodology

The bone was recorded to species/taxonomic category where possible and to size class in the case of unidentifiable bones such as ribs, fragments of longbone shaft and the majority of vertebra fragments. Recording follows the established techniques whereby details of the element, species, bone portion, state of fusion, wear of the dentition, anatomical measurements and taphonomic including natural and anthropogenic modifications to the bone were registered. The cattle horncore assemblage was recorded according to the criteria described in Armitage (1982), while calculations of shoulder heights were based on multiplication factors given in Driesch and Boessneck (1974).

Description of faunal assemblage by phase

The site provided a total of approximately 250 fragments of animal bone. The great majority of these were taken from a collection of cattle horncores (see below), which were in a rather fragmented state. These clearly belonged to a small number of relatively complete cores. The number of bones was therefore reduced to a grand total of 36 fragments. Most of the bones (see Table 1) were derived from deposits post dating the tannery (phase 5), although a small proportion was taken from various features associated with these works (phase 4). All of the

bones are well preserved, although, as stated, some collections feature a high level of fragmentation.

Phase:	4	5	Unphased
Species			
Cattle	4	13	
Equid	1		1
Cattle-size		3	3
Sheep/Goat	1		
Sheep		1	
Pig		1	
Sheep-size		1	
Whale	1	1	1
Small mammal		1	
Mallard		3	
Total	**7**	**24**	**5**

Table 1: Counts of hand collected animal bones in each occupation phase

Phase 4

Bones were recovered from each of the four excavated tanpits i.e. B, C and F (from the evaluation) and pit [1052] from the later excavation, as well as from the 19th century pit [1045].

The nature of the site is illustrated by the occurrence of a number of cattle skull fragments, including two horncores (see table 2). Each of the horncores are probably from unimproved longhorns (see below), while one of the skull pieces clearly represents a polled (hornless) variety. This is from a rather small animal and may well have been a Suffolk Dun, the principal polled cattle type present in England prior to late 19th century innovations. During this period the Suffolk Dun was crossed with horned Norfolk cattle creating the Norfolk and Suffolk Red Poll (later abbreviated to the Red Poll), becoming a registered breed in 1883 (Trow-Smith 1959, 105).

The other species include sheep, equid and whale. The single sheep bone was from a large animal, a tibia with a greatest distal breadth of 31.4mm. This may be from one of the improved breeds which were entering the London meat markets from the early 19th century (Rixson

2000, 215). A complete equid metacarpus from a dump deposit [114] belonged to a short and stout adult individual, probably a pony, this measuring approximately 131cm at the shoulder. Finally, there were a few whale fragments from pit [1045], which clearly represent a single bone from a large species. Unfortunately, it is not possible to gain a better identification, either to skeletal part or species, as only the internal 'honeycomb' bone has survived.

Phase 5

This assemblage was divided between the dump deposit [1007] and the cattle horncore capping/lining [1006] of drain [1005]. The horncores in the latter feature had been laid side by side across the drain in a sequence where one or more cores with their points placed to the left are then followed by those with their points to the right, this alternating pattern allowing for a close linear arrangement. The excavated part of this feature was capped with at least 40 to 50 cores, of which maybe 25% was collected. It was obviously somewhat difficult to excavate these cores, as shown by the advanced stage of fragmentation of those horncores available for this study. Following analysis, these fragments were found to include a minimum number of 10 skulls, comprising individual horncores and/or nuchal (posterior skull) pieces, representing 7 and 3 individuals respectively.

The horncores (shown in Table 2) include a mixture of sub-adult (aged between 2 and 3 years) and adult forms (Young adult between 3 and 7 years and adult between 7 and 10 years). There are also a variety of sexes with a notable preponderance of oxen. The 'types' are limited to shorthorn and longhorned, categorised as those with lengths less than 220 and in excess of 360mm respectively. It was possible to sex the majority of the adult specimens within the larger category, including the two varieties of ox horncores and one of the two varieties of bull, as described in Armitage (1982). Just two of the horncores showed butchery but judging by the parts of the skull left with the core, the typical method used to remove the horn from the skull involved chops in front and below the horn followed or possibly preceded by splitting the skull between the horns.

Phase	Context	**Age**	**Type**	**Sex**	**N**
4	1052	subadult	?longhorn	?Ox (type 2)	1
	1045	young adult	longhorn	Ox (type 1)	1
5	1006	adult	longorn	Ox (type 1)	1
		young adult	longhorn	Ox (type 2)	2
		young adult			1

		subadult	?longhorn		2
		young adult	?longhorn	Bull (type 2)	1
		adult	shorthorn		1

Table 2. Representation of cattle horncores by age, 'type' and sex (after Armitage 1982)

As well as horncores, this deposit also provided a small fragment of whalebone. Various characteristics of this bone suggest it is part of a mandible, possibly not dissimilar to the right whale fragment discovered in an unphased deposit (see below).

The bones from [1007] include a combination of food and processing waste including a femur from a large subadult pig and a cattle-size rib, alongside a sheep metatarsus and three duck skulls respectively. In the latter category, there was another polled cattle skull, similar to the example from phase 4.

Unphased

Undated assemblages are generally excluded at the analysis stage, however, deposit [1003] which has been tentatively described as 'a Victorian occupation layer', revealed the proximal end of a large whale mandible. This is very similar to several such bones found at Rainbow Quay, Greenland Dock, which were identified as Greenland Right Whale (Douglas 1998). In comparison with these examples, this Greenwich mandible has also been sawn through the shaft close to the proximal end (see Figure 1).

Conclusion and recommendations for further work

It has been suggested that the tanpits were used for the processing of heavy leathers and the juxtaposition of cattle horncores and skull fragments would lend further credence to this interpretation. Such bones are generally viewed as tanners waste, as the skins would have arrived with a part of the skull still attached, the bone would then have been removed and the horn and/or horn sheaves sent on to the hornworker (Serjeantson 1989, 129; Yeomans 2004, 71). The major concentration of horncores postdates the tannery, but it can be assumed that they derive from these works. A similar, though larger, quantity of cattle horncores were discovered from a Thameside site just to the north, at Greenwich Reach, these dated to the early 18th century (Rielly 2009). This evidence would suggest that one or more tanyards were in operation in this area throughout most of the 18th and 19th centuries.

The few whale bones undoubtedly attest to the whaling industry which was active in London during the 18th and most of the 19th century. The major quarry of the whaling industry during much of this period was the Greenland Right whale, which was valued principally for its baleen and its oil, rendered from its blubber and also from particular bones, generally the mandible. Numerous examples of Right whale mandibles have been found at Thameside London sites, in particular from the 18th century try works at Greenland Dock (Douglas 1988). While it would seem more appropriate to jettison these fragments once the oil has been removed (generally taken on board the whaling ship), certain bones may have been brought back for other uses or perhaps as keepsakes.

In conclusion, this assemblage has added further information, alongside the evidence from Greenwich Reach, regarding the tanning industry in Greenwich. The size and shape of the horncores has yielded data concerning the type(s) of cattle imported to London during this period. Of particular interest was the recovery of two polled specimens, which are rare finds from post medieval London. This data should be compiled and contrasted with the aforementioned evidence from Greenwich Reach. The whalebones and especially the large mandible, though unphased, is an important addition to the corpus of whalebones found in London. It is recommended that the identification of this bone should be resolved, which can be readily achieved by sending pictures of the bone to the cetacean expert at the Natural History Museum.

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Figure 1. A mandible from a large baleen whale (possibly Greenland Right Whale), which has been sawn through the shaft (on the left) and the proximal end (on the right). It is 672mm in length.

Palaeoenvironmental Evidence (Wessex Archaeology Limited)

Introduction

Environmental samples taken

A total of eight bulk samples were taken from the two evaluations, three from 69650 and five from 69651. Six of the samples came from pits of 18th to 19th century date, associated with probable tanning. The remaining two samples came from possible alluvial layers within 69650 Trench 1.

All the samples were examined for both waterlogged and charred remains. A single sub-sample of a litre from each sample was initially processed (as detailed below) and tested for waterlogged. In three cases no waterlogged material was seen and the remainder of each sample was processed for bulk remains. In the remaining five samples large quantities of wood chippings were seen, but relatively little other material and on this bases the larger wood material was recovered through a 4mm mesh for identification purposes.

Table 1: Processing conducted for the eight samples with observation on the presence of waterlogged material

Trench	Feature Layer	Context	Sample	Waterlogged 250µm	Bulk Charred 0.5mm mesh	Artefact for wood 4mm	Waterlogged
69650							
1	Alluvial	115	1	1	24	none	No waterlogged
1	gleyed	116	2	1	23		No waterlogged
5	Pit F	509	3	1	-	9	Wood chippings
69651							
-	Pit 1052	1008	1	1	-	17	Wood chippings
-	Pit 1052	1038	2	1	-	17	Wood chippings
-	Pit 1053	1015	3	1	-	18	Wood chippings
-	Pit 1053	1040	4	1	-	19	Wood chippings
-	Pit 1045	1047	5	0	10	0	No waterlogged

Charred Plant Remains

Three samples from layers 115 and 116 and pit 1045 with little to no evidence of waterlogging were processed by standard flotation methods; the flot was retained on a 0.5 mm mesh, residues fractionated into 5.6 mm, 2mm and 1mm fractions and dried. The coarse fractions (>5.6 mm) were sorted, weighed and discarded. Flots were scanned under a x10 – x40 stereo-binocular microscope and the presence of charred remains quantified (Table 1) to record the preservation and nature of the charred plant and wood charcoal remains.

Preliminary identifications of dominant or important taxa are noted below, following the nomenclature of Stace (1997).

The flots were very small, with generally few charred remains. However there were almost no roots or modern seeds, reflecting that the samples came from well-sealed deposits. Where present the charred material was generally fairly well-preserved.

Both the possible alluvial clays had remains of charred cereals, mainly rachis fragments of rye (*Secale cereale*), but also grains of oats (*Avena* sp.), buttercup (*Ranunculus arvensis*) and rye-grass/darnel (*Lolium* sp.) from context 116. The final sample from Pit 1045 (1047) had no charred plant remains. Such remains are consistent with general settlement refuse that includes cereal processing waste.

Wood Charcoal

Wood charcoal was noted from the flots of the bulk samples and is recorded in Table 1. Fragments of coal as might be expected given the date of the samples were reasonably frequent in all three flots. This was true in particular of context (116) where there was relatively little wood charcoal in comparison to larger fragments of coal.

Waterlogged plant remains

Some features were noted to be waterlogged, or partially waterlogged, in the field. Subsamples of 1 litre were taken from bulk samples from these features and processed for the recovery of waterlogged remains. Laboratory flotation was undertaken with flots retained on a 0.25mm mesh and residues on a 0.5mm mesh. Residues and flots were stored in sealed containers with Industrial Methylated Spirits (IMS). The larger fraction (>5.6mm) was sorted, weighed and discarded. The flots were visually inspected under a x10 to x40 stereo-binocular microscope to determine if waterlogged material occurred. Where waterlogged material was present, preliminary identifications of dominant taxa, were conducted and are presented below.

Five of the samples from three of the pits, pit F (509), 1052 (1008, 1038) and 1053 (1015, 1040), contained high numbers of waterlogged material. On closer examination this comprised almost entirely of wood chippings, including bark, with little other material present. No insect remains were noted within the samples. Such material undoubtedly relates to the use of the pits for tanning and has been recorded from other pits of similar date (McKinley 2006).

While the remaining three samples appeared to have little or no waterlogged material, occasional seeds of dead-nettle (*Lamium* sp.), elder (*Sambucus niger*) and nettle (*Urtica dioica*) were recorded from context 116. Pit 1045 also contained very occasional uncharred fragments of wood. Such material may either be derived from reworked intrusive wood from

the other features, or it may be that the feature once contained wood chippings in larger quantities, but had dried out.

Land and fresh/brackish water molluscs

Shells of both land and fresh mollusca were recorded in only one sample, that from the alluvial layer in Trench 1, context 116. These comprised mainly shells of *Vallonia* sp., an open country dry ground species, and *Lymnaea* sp. a fresh water species of both slow moving riverine environments and bodies of still to stagnant water.

POTENTIAL

Introduction

The environmental material has some limited potential to investigate some aspects of the site further.

Charred plant remains

The charred plant remains have the potential to show which crops were brought in and processed on or in the vicinity of the site during its occupation. However, given the low amounts of material available and that identifications have been carried out in full, potential for analysis is very limited.

Wood charcoal

There is not enough wood charcoal in the sample for any potential analysis.

Waterlogged plant remains

While the scope for any further analysis of waterlogged plant remains in terms of the local environment of the site, there is limited there is good potential to explore and identify the range of woods used for tanning.

Land Snails and fresh/brackish water molluscs

While the molluscs provide information on the local environment the snails have very little potential given the narrow range of species recorded and that they are only present within a single sample.

Acknowledgements

The samples were processed by Marta Perez-Fernandez. The bulk and waterlogged samples were assessed by Dr Chris J. Stevens.

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Table 2: Assessment of the charred plant remains and charcoal

Samples				Flot							
Feature	**Context**	**Sample**	**Vol Ltrs**	**Flot (ml)**	**% roots**	**Grain**	**Chaff**	**Charred other**	**Comments**	**Charcoal >4/2mm**	**Other**
69650 Trench 1											
Alluvial Clay	115	1	25	8	3	C	C	-	Rye rachis frags x3 Rachis indet x 2	0/0.2ml	-
?Alluvial Clay	116	2	24	40	5	C	B	B	Cereal grain indet x1 Rye rachis frags x5-6 *Ranunculus* arb *Avena*, *Lolium*, *Carex*	0.1/0.3ml	Moll-w (B) Moll-t (B)
69651											
Pit 1045	1047	5	10	20	1	-	-	-	Uncharred fragments of waterlogged wood	-	Bone (C)

Key: - A*** = exceptional, A** = 100+, A* = 30-99, A = >10, B = 9-5, C = <5 sab, Moll-t = terrestrial molluscs, Moll-f = freshwater molluscs.

Context Index

Context No	Plan No	Phase	Type	Description	Trench	notes
101	0	6	Layer	Modern concrete	Eval Trench 1	Modern concrete
102	102	6	Layer	Made ground	Eval Trench 1	Modern made ground
103	102	5	Masonry	Brick wall	Eval Trench 1	Modern brick wall running E-W
104	0	6	Layer	Made ground	Eval Trench 1	Modern made ground
105	102	5	Layer	Made ground	Eval Trench 1	Modern made ground
106	0	6	Layer	Concrete foundation	Eval Trench 1	Modern concrete foundation
107	0	6	Layer	Concrete foundation	Eval Trench 1	Modern concrete foundation
108	0	6	Layer	Concrete foundation	Eval Trench 1	Modern concrete foundation
109	0	5	Masonry	Brick culvert	Eval Trench 1	19th century brick culvert running N-S
110	0	5	Fill	Fill of brick culvert [109]	Eval Trench 1	Fill of brick culvert [109]
111	0	4	Layer	Demolition layer	Eval Trench 1	Demolition layer
112	0	3	Layer	Ploughsoil	Eval Trench 1	Possible ploughsoil layer, undated, post-med
113	0	3	Layer	Made ground	Eval Trench 1	Made ground, undated, post-med
114	0	2	Layer	Made ground	Eval Trench 1	Made ground, undated, post-med
115	0	2	Layer	Alluvial clay	Eval Trench 1	Alluvial clay layer, undated, post-med
116	0	2	Layer	Alluvial clay	Eval Trench 1	Alluvial clay layer, undated, post-med
117	0	2	Layer	Alluvial gravel	Eval Trench 1	Alluvial gravel layer, undated, post-med
118	0	2	Layer	Alluvial clay	Eval Trench 1	Alluvial clay layer, undated, post-med
119	0	2	Layer	Alluvial clay	Eval Trench 1	Alluvial clay layer, undated, post-med
120	0	1	Layer	Natural gravel	Eval Trench 1	Natural Thames gravel
201	0	6	Layer	Modern concrete	Eval Trench 2	Modern concrete
202	0	6	Layer	Made ground	Eval Trench 2	Modern made ground
203	0	6	Layer	Made ground	Eval Trench 2	Modern made ground
204	0	6	Layer	Made ground	Eval Trench 2	Modern made ground
205	0	6	Layer	Made ground	Eval Trench 2	Modern made ground
206	0	6	Layer	Made ground	Eval Trench 2	Modern made ground
207	0	5	Layer	Made ground	Eval Trench 2	?19th century made ground
208	0	5	Layer	Made ground	Eval Trench 2	?19th century made ground
301	0	6	Layer	Made ground	Eval Trench 3	Modern made ground
302	0	6	Layer	Made ground	Eval Trench 3	Modern made ground/demo layer
303	0	6	Layer	Made ground	Eval Trench 3	Modern made ground/demo layer
304	0	6	Layer	Made ground	Eval Trench 3	Modern made ground/demo layer
305	0	6	Layer	Made ground	Eval Trench 3	Modern made ground/demo layer
306	0	6	Layer	Made ground	Eval Trench 3	Modern made ground/demo layer with very frequent yellow brick
401	0	6	Layer	Concrete	Eval Trench 4	Modern concrete
402	0	6	Layer	Made ground	Eval Trench 4	Modern made ground
403	0	6	Layer	Made ground	Eval Trench 4	Modern made ground
404	0	5	Layer	Silty layer	Eval Trench 4	Silty layer which overlies the timber lined tanning pits [405]
405	401	4	Timber	Timber structure	Eval Trench 4	Structure number assigned to a number of timber lined tanning pits
406	0	4	Fill	Fill of tanning pits	Eval Trench 4	Fill number given to the upper fill of a number of timber lined tanning pits [405]
501	0	6	Layer	Made ground	Eval Trench 5	Modern made ground
502	0	6	Layer	Concrete	Eval Trench 5	Modern concrete
503	0	6	Layer	Made ground	Eval Trench 5	Modern made ground
504	0	6	Layer	Made ground	Eval Trench 5	Modern Made ground
505	0	5	Layer	Dump layer	Eval Trench 5	Dump/post occupation layer which overlies the series of timber lined tanning pits
506	501	4	Fill	Fill of tanning pit	Eval Trench 5	Fill of timber lined tanning pit F

Context No	Plan No	Phase	Type	Description	Trench	notes
507	501	4	Fill	Fill of tanning pit	Eval Trench 5	Fill of timber lined tanning pit F
508	501	4	Fill	Fill of tanning pit	Eval Trench 5	Fill of timber lined tanning pit F
509	501	4	Fill	Fill of tanning pit	Eval Trench 5	Fill of timber lined tanning pit F
510	501	4	Fill	Fill of tanning pit	Eval Trench 5	Fill of timber lined tanning pit F
511	501	4	Fill	Fill of tanning pit	Eval Trench 5	Fill of timber lined tanning pit F
512	501	4	Timber	Timber structure	Eval Trench 5	Western timber lining of tanning pits C & F
513	501	4	Timber	Timber structure	Eval Trench 5	Timber lining of tanning pit E, individual planks given context number [522]
514	501	4	Timber	Timber structure	Eval Trench 5	Timber lining of tanning pit D
515	501	4	Timber	Timber structure	Eval Trench 5	Timber lining at western extreme of tanning pit complex
516	501	4	Timber	Timber structure	Eval Trench 5	Timber lining of tanning pit A
517	501	4	Timber	Timber structure	Eval Trench 5	Timber lining of tanning pit B
518	501	4	Timber	Timber structure	Eval Trench 5	Timber lining of tanning pit C
519	501	4	Timber	Timber structure	Eval Trench 5	Context register illustrates this as timber lining of tanning pit D but plan suggests it might be timber walkway NW of tanning pit D
520	501	4	Timber	Timber structure	Eval Trench 5	Context register illustrates this as timber lining of tanning pit E
521	501	4	Timber	Timber structure	Eval Trench 5	Context register illustrates this as timber lining of tanning pit I but plan suggests it might be the area of walkway between tanning pits F & I
522	501	4	Timber	Timber planking	Eval Trench 5	Timber planking of timber lining [513] of tanning pit E
523	501	4	Timber	Timber upright	Eval Trench 5	Timber upright, part of timber lining [513] of tanning pit E
524	501	4	Fill	Clay backfill	Eval Trench 5	Clay backfill between timber lined tanning pits B & C
525	501	4	Masonry	Brick lining	Eval Trench 5	Single course of brick lining between tanning pits B & C upon which timber walkway was installed, may originally have been a walkway itself
526	501	4	Timber	Timber structure	Eval Trench 5	Timber lining of tanning pit C
527	501	4	Timber	Timber structure	Eval Trench 5	Timber lining of tanning pit B
528	501	4	Timber	Timber structure	Eval Trench 5	Timber walkway between timber lined tanning pits B & C, laid upon single course of bricks [525]
529	501	4	Fill	Fill of tanning pit	Eval Trench 5	Fill of timber lined tanning pit C
530	501	4	Fill	Fill of tanning pit	Eval Trench 5	Fill of timber lined tanning pit C
531	501	4	Fill	Fill of tanning pit	Eval Trench 5	Fill of timber lined tanning pit C, very frequent wood chips
532	501	4	Fill	Fill of tanning pit	Eval Trench 5	Primary Fill of timber lined tanning pit C
533	501	4	Fill	Fill of tanning pit	Eval Trench 5	Upper fill of timber lined tanning pit A, unexcavated
534	501	4	Fill	Fill of tanning pit	Eval Trench 5	Upper fill of timber lined tanning pit B, unexcavated
535	501	4	Fill	Fill of tanning pit	Eval Trench 5	Upper fill of timber lined tanning pit D, unexcavated
536	501	4	Fill	Fill of tanning pit	Eval Trench 5	Upper fill of timber lined tanning pit E, unexcavated
537	501	4	Fill	Fill of tanning pit	Eval Trench 5	Upper fill of timber lined tanning pit G, unexcavated
538	501	4	Fill	Fill of tanning pit	Eval Trench 5	Upper fill of timber lined tanning pit H, unexcavated
539	501	4	Fill	Fill of tanning pit	Eval Trench 5	Upper fill of timber lined tanning pit I, unexcavated
1000	0	6	Layer	Modern concrete	Excavation Area	Modern concrete
1001	0	6	Layer	Modern cobbles	Excavation	Modern cobbles

Context No	Plan No	Phase	Type	Description	Trench	notes
					Area	
1002	0	5	Layer	19th Century made ground	Excavation Area	19th century made ground
1003	0	0	VOID	VOID	0	VOID
1004	0	5	Layer	19th century made ground	Excavation Area	19th century made ground, redeposited gravels
1005	0	5	Cut	Drainage Cut	Excavation Area	Cut for drainage channel with horn core capping [1006]
1006	1	5	Layer	Horn core feature	Excavation Area	Horn core deposit within drainage cut [1005] thought to be a capping
1007	0	5	Layer	Demo layer/post occupation layer	Excavation Area	Post occupation layer which overlies the area of tanning pits
1008	2	4	Fill	Fill of tanning pit [1052]	Excavation Area	Fill of timber lined tanning pit [1052]
1009	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1010	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1011	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1012	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1013	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1014	2	4	Fill	Fill of tanning pit	Excavation Area	Fill of timber lined tanning pit [1054]
1015	2	4	Fill	Fill of tanning pit	Excavation Area	Fill of timber lined tanning pit [1053]
1016	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1017	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1018	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1019	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1020	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1021	2, 6, 7	4	Timber	Timber walkway	Excavation Area	Timber walkway associated with tanning pits, same as [1027], not excavated
1022	2, 6, 7	4	Timber	Timber walkway	Excavation Area	Timber walkway associated with tanning pits, same as [1027], not excavated
1023	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1024	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1025	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1026	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1027	2, 9	4	Timber	Timber walkway	Excavation Area	Timber walkway structure running north-south between timber lined tanning pits [1052] & [1053]
1028	2, 6, 7	4	Timber	Timber walkway	Excavation Area	Timber walkway associated with tanning pits, same as [1027], not excavated
1029	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1030	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1031	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1032	2, 6,	4	Fill	Fill of tanning pit	Excavation	Upper fill of timber lined tanning pit not given

Context No	Plan No	Phase	Type	Description	Trench	notes
	7				Area	a context number, fill unexcavated
1033	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1034	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1035	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1036	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1037	2, 6, 7	4	Fill	Fill of tanning	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1038	2, 9	4	Fill	Fill of tanning pit	Excavation Area	Fill of timber lined tanning pit [1052]
1039	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1040	2, 9	4	Fill	Fill of tanning pit	Excavation Area	Fill of timber lined tanning pit [1053]
1041	0	0	VOID	VOID	0	VOID
1042	8	5	Layer	Bedding layer	Excavation Area	Bedding layer for cobble surface [1044]
1043	8	5	Layer	Bedding layer	Excavation Area	Bedding layer for cobble surface [1044]
1044	8	5	Layer	Cobble surface	Excavation Area	19th century cobble surface
1045	5b	4	Cut	Pit cut	Excavation Area	19th century pit cut
1046	1	5	Fill	Fill of gully [1005]	Excavation Area	Fill of linear gully [1005]
1047	5b	4	Fill	Fill of pit [1045]	Excavation	Fill of 19th century pit [1045]
1048	5b	4	Fill	Fill of pit [1045]	Excavation Area	Fill of 19th century pit [1045]
1049	5b	4	Cut	Pit cut	Excavation Area	19th century pit cut
1050	5b	4	Fill	Fill of pit cut [1049]	Excavation Area	Fill of 19th century pit [1049]
1051	0	1	Layer	Natural gravel	Excavation Area	Natural Thames gravel
1052	2, 9	4	Timber	Timber structure	Excavation Area	Structure number assigned to the timber lining of a tanning pit
1053	2, 9	4	Timber	Timber structure	Excavation Area	Structure number assigned to the timber lining of a tanning pit
1054	2, 9	4	Timber	Timber structure	Excavation Area	Structure number assigned to the timber lining of a tanning pit
1055	2, 9	4	Fill	Fill of tanning pit	Excavation Area	Fill of timber lined tanning pit [1054]
1056	9	4	Layer	Clay layer	Excavation Area	Clay layer between two timber lined tanning pit structures [1053] & [1054]. Also below associated timber walkway [1057]
1057	2, 9	4	Timber	Timber structure	Excavation Area	Timber walkway structure running between timber lined tanning pits [1053] & [1054]
1058	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1059	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1060	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1061	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1062	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1063	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated

Context No	Plan No	Phase	Type	Description	Trench	notes
1064	2, 6, 7	4	Layer	Cobble bedding layer	Excavation Area	Cobble bedding layer upon which a timber walkway between tanning pits would have been lain
1065	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1066	2, 6, 7	4	Fill	Fill of tanning pit	Excavation Area	Upper fill of timber lined tanning pit not given a context number, fill unexcavated
1067	0	0	VOID	VOID	0	VOID
1068	0	0	VOID	VOID	0	VOID
1069	0	4	Cut	Cut for tannery complex!	Excavation Area	Cut number assigned to entire complex of numerous timber lined tanning pits. Not seen or planned
1070	9	4	Layer	Cobble bedding layer	Excavation Area	Layer of cobbles upon which timber walkway structure [1027] was lain
1071	9	4	Layer	Bedding layer	Excavation Area	Bedding layer for timber walkway [1027]
1072	9	4	Fill	Backfill between timber lined tanning pits	Excavation Area	Backfilled deposit between timber lined tanning pits [1052] & [1053]
1073	9	4	Fill	Backfill between timber lined tanning pits	Excavation Area	Backfilled deposit between timber lined tanning pits [1052] & [1053]
1074	9	4	Fill	Backfill between timber lined tanning pits	Excavation Area	Backfilled deposit between timber lined tanning pits [1052] & [1053]
1075	9	4	Layer	Clay waterproof lining	Excavation Area	Clay waterproof lining deposit on the outside of timber lined tanning pit [1053]
1076	9	4	Layer	Clay waterproof lining	Excavation Area	Clay waterproof lining deposit on the outside of timber lined tanning pit [1052]
1077	9	4	Timber	Timber upright	Excavation Area	Timber upright between timber lined tanning pits [1053] & [1054]
1078	0	5	Layer	Dump/levelling layer	Excavation Area	Dump/levelling layer, redeposited natural gravel

Oasis Form

OASIS ID: preconst1-70309

Project details

Project name	An Archaeological Evaluation, Excavation and Watching Brief at 43-81 Greenwich High Road, London Borough of Greenwich, S
Short description of the project	An Archaeological evaluation, Excavation and Watching Brief was undertaken at 43-81 Greenwich High Road, London Borough of Greenwich, SE10. An archaeological evaluation consisting of 5 trenches recorded natural gravel overlain by alluvium and made ground. Two trenches recorded a tannery complex dating to the late 18th to late 19th century. A subsequent excavation was conducted around these and a total of 28 were recorded.
Project dates	Start: 01-06-2008 End: 01-03-2009
Previous/future work	Yes / No
Any associated project reference codes	GHI 08 - Sitecode
Type of project	Field evaluation
Site status	Area of Archaeological Importance (AAI)
Current Land use	Industry and Commerce 1 - Industrial
Monument type	TANNERY COMPLEX Post Medieval
Monument type	ALLUVIUM Uncertain
Significant Finds	WHALE BONE Post Medieval
Methods & techniques	'Sample Trenches','Targeted Trenches'
Development type	Rural residential
Prompt	Direction from Local Planning Authority - PPG16

Position in the planning process	Not known / Not recorded

Project location

Country	England
Site location	GREATER LONDON GREENWICH GREENWICH 43-81 Greenwich High Road, London Borough of Greenwich
Postcode	SE10
Study area	16440.00 Square metres
Site coordinates	TQ 3760 7710 51.4755994588 -0.01843297682790 51 28 32 N 000 01 06 W Point
Height OD / Depth	Min: 0.90m Max: 2.70m

Project creators

Name of Organisation	CgMs Consulting Ltd
Project brief originator	CgMs Consulting Ltd
Project design originator	CgMs Consulting Ltd
Project director/manager	Tim Bradley
Project supervisor	Neil Hawkins
Type of sponsor/funding body	Galliard Homes

Project archives

Physical Contents	'Animal Bones','Ceramics'
Digital Media available	'Database','Survey','Text'
Paper Media	'Context

available	sheet','Diary','Drawing','Matrices','Photograph','Plan','Report','Section','Survey ','Unpublished Text'

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	An Archaeological Evaluation, Excavation and Watching Brief at 43-81 Greenwich High Road, London Borough of Greenwich, SE10
Author(s)/Editor(s)	Hawkins, N
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Entered on	11 January 2010

APPENDIX 12: BUILDING RECORDING REPORT: 43-81 GREENWICH HIGH ROAD

BUILDING RECORDING

LAND AT
43-81 GREENWICH ROAD
LONDON

APRIL 2008

WA Heritage

43-81 GREENWICH HIGH ROAD
LONDON BOROUGH OF GREENWICH

Building Recording

Prepared for
CgMs Consulting
Morley House
26 Holborn Viaduct
London
EC1A 2AT

On behalf of
Galliard Homes

By
WA Heritage
Wessex Archaeology
Portway House
Old Sarum Park
SALISBURY
Wiltshire
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Report reference: 68660.01

10th April 2008

43-81 GREENWICH HIGH ROAD LONDON BOROUGH OF GREENWICH

Building Recording

CONTENTS

LIST OF FIGURES AND PLATES

43-81 GREENWICH HIGH ROAD LONDON BOROUGH OF GREENWICH

Building Recording

SUMMARY

WA Heritage, a specialist division of Wessex Archaeology, was commissioned by CgMs Consulting on behalf of Galliard Homes to undertake building recording at 43-81 Greenwich High Road in the London Borough of Greenwich, centred on Ordnance Survey NGR 537600 177100, hereafter the Site. The work was required to meet a planning condition imposed by the Local Planning Authority. The proposal is to demolish the 19th and 20th century buildings which currently occupy the Site and redevelop the Site for residential use. The aim of the building recording was to make a record of the buildings prior to demolition. A photographic record and written description of the buildings was made on 26th February 2008.

The Site lies on the north-west side of Greenwich High Road. The Merryweathers Tram Locomotive works and Fire Fighting Equipment Factory occupied the Site from 1876 (Page-Smith 2007, 12) to the late 20th century. In 2006, it was used as a coach depot which included buildings with associated petrol storage and filling pumps (ibid., 14). It was clear from the recent site visit, that the larger buildings had last been used as rented business units, mainly offices. None of the buildings are Listed.

The building recording showed that remains of buildings possibly shown on the 1830 Greenwood map and associated with the Tannery shown on that map were still extant at the time of the site visit. These remains had become incorporated into a large 1950s building now known as Engine House Block 1, a toilet block and a boundary wall. A building now known as Station House Block 2 (*Erecting Shop*) appears to have been built in 1876 when Merryweather and Sons established their business on site. A boundary wall to the west of Engine House Block 1 contained blocked window and door openings and represents the remains of a Tram Depot building which had been built by 1894.

A building, now known as Pump House Block 3, was built between 1929 and 1934 as the '*New Erecting Shop*'. This building was originally connected to the south side of the Station House Block 2 '*Erecting Shop*'. A building, now known as Brigade House Block 4, was added as a '*Canteen*' to the east side of the Pump House '*New Erecting Shop*' between 1941 and 1952. It replaced a smaller canteen, presumably to cater for the increase in staff at Merryweathers during the Second World War (1939-45). Bombing during the war appears to have resulted in the construction of buildings now known as Bell House Block 6 and the northern part of Siren House Block 5 between 1944 and 1952. This building included a *'Machine Shop', 'Drawing Office', 'Typing Pool', 'Chairman's Office', 'Chairman's Secretary's Office', 'Buying and Costing Department' and 'Accounts Office'*. Between 1946 and 1952, the southern part of Siren House Block 5 was built, replacing a '*Carpenters Shop*'. Possibly at the same time, or slightly earlier, a third storey was added to Bell House Block 6. Between 1949 and 1958, Engine House Block 1 replaced earlier buildings on its site. This building incorporated a '*Blacksmiths Shop', 'Extinguisher Charge Shop', 'Coppersmiths Shop', 'Compressor Room', 'Ladder Makers Shop', 'Gas Generator', 'Boiler House', 'Stores' and 'Hose Tower'.*

43-81 GREENWICH HIGH ROAD LONDON BOROUGH OF GREENWICH

Building Recording

ACKNOWLEDGEMENTS

Duncan Hawkins, Director of CgMs Consulting, commissioned the project on behalf of Galliard Homes. WA Heritage would like to thank Controlled Group, the demolition contractors, for their assistance with site access. The help and assistance of Galliard Homes and Kate Page-Smith of CgMs Consulting is also gratefully acknowledged. The collaborative role of the Greater London Advisory Service is also acknowledged.

The project was managed for WA Heritage by Paul Falcini. The building recording was undertaken by Charlotte Matthews. The photography was carried out by Elaine Wakefield. This report was compiled by Charlotte Matthews and the figures were prepared by Kitty Brandon.

43-81 GREENWICH HIGH ROAD LONDON BOROUGH OF GREENWICH

Building Recording

1 PROJECT BACKGROUND

1.1.1 WA Heritage, a specialist division of Wessex Archaeology, was commissioned by CgMs Consulting on behalf of Galliard Homes to undertake building recording at 43-81 Greenwich High Road in the London Borough of Greenwich, centred on Ordnance Survey NGR 537600 177100, hereafter the Site (**Figure 1**). The work was required to meet a planning condition imposed by the Local Planning Authority. The proposal is to demolish the 19th and 20th century buildings which currently occupy the Site and redevelop the Site for residential use.

1.1.2 The Site lies on the north-west side of Greenwich High Road. It is bounded to the north and west by Deptford Creek (River Ravensbourne), by a sewage pumping works to the north-east and by a warehouse to the south-east.

1.1.3 The Merryweathers Tram Locomotive works and Fire Fighting Equipment Factory occupied the Site from 1876 (Page-Smith 2007, 12) to the late 20th century. In 2006, it was used as a coach depot which included buildings with associated petrol storage and filling pumps (ibid., 14). It was clear from the recent site visit, that the larger buildings had last been used as rented business units, mainly offices. None of the buildings are Listed.

1.1.4 The building recording was undertaken in accordance with a Written Scheme of Investigation (Wessex Archaeology 2008), which was agreed in advance of the start of the work by Greater London Advisory Service (GLAAS), hereafter the Curator. The recording was carried out in accordance with guidance given in the document by the Institute of Field Archaeologists' *Standard and Guidance for the archaeological investigation and recording of standing buildings and structures* (IFA 1996, revised 1999). As agreed with the Curator, the building recording was undertaken broadly in accordance with that defined by Level 2 of English Heritage 2006 *Understanding Historic Buildings: A guide to good recording practice*. It was carried out on 26 February 2008.

2 METHODS

1.2 Aims and Objectives

1.2.1 The aim of the building recording as set out in the Written Scheme of Investigation was to make a record of the buildings prior to demolition. This record was to be broadly in accordance with that defined by Level 2 of English Heritage 2006 *Understanding Historic Buildings: A guide to good recording practice*

1.3 Building Recording

1.3.1 A site visit to record the buildings was made on 26th February 2008. The building recording comprised a written description of the buildings. No detailed architect's plans of the buildings were available at the time of the site visit. Only those roof spaces which were visible from the uppermost floor were inspected. During the site visit, notes were made on the buildings and some rough unmeasured sketches were made. At the time of the site visit, the buildings were clearly labelled with their name and block number, presumably from the site's recent use as rented offices. These names and numbers have been used in this report and two toilet blocks and a boundary wall have been added to the system (**Figure 1**). The buildings have been described in this report with site north to the north-west to avoid long descriptions, i.e. south elevation is used instead of south-east elevation.

1.3.2 A photographic survey was also carried out on 26th February. A total of 179 digital photographs, five colour slide films (35mm) and five black and white fillms were taken. A selection of photographs from the full photographic archive has been reproduced in this report (**Plates 1** to **24**). **Figure 2** shows the direction of these plates.

1.3.3 Following the site visit, CgMs Consulting provided on a CD, digital images of Merryweather's archive material held in the London Metropolitan Archives (LMA) held under the reference number: Building Act Cases/Greenwich High Road/Greenwich METB/Merryweather and Company/1916 – 1949 GLC/AR/BR/10/GR/0042/C/BA. These served to clarify the development of the various buildings and their construction dates. From this material, an approximate phase plan for the Site has been produced (**Figure 2**).

2 RESULTS

2.1 Block 1: Engine House

2.1.1 The Engine House is mid 20th century in appearance (**Plates 1-3**). Its footprint is not shown on the 1952 Ordnance Survey map but is shown on the 1958 and later Ordnance Survey maps (Page-Smith 2007, figs 15-19).

2.1.2 Drawings dated August 1949 for '*Proposed Single and Two Storey Buildings and Hose Tower, Greenwich High Road*' for Merryweather and Sons in the London Metropolitan Archives (LMA) show plans, sections and elevations of the Engine House. The 1939-45 bomb damage map (Page-Smith 2007, Fig. 14) shows that this building replaced earlier buildings that were damaged by bombing during the Second World War. These earlier buildings are clearly shown on a '*Site Layout Plan*' dated July 1944 in the LMA.

2.1.3 The Engine House is an industrial building, constructed in flettons in English bond with concrete sills and lintels to its openings and bullnose bricks at the sides of its doorways (**Plates 1-3**). The original Crittall windows mostly survive. All the openings have closers and show little alteration. A ground floor doorway in the west elevation in Bay 5 (bays numbered from south to north) has been converted from a window since the closers do not continue below original window sill level (**Plate 1**). Reinforced concrete posts support reinforced concrete cross beams which support the floors. Steel roof trusses

are covered with asbestos corrugated sheeting. The drawings in the LMA label the various parts of the building as '*Blacksmiths Shop*', '*Extinguisher Charge Shop*', '*Coppersmiths Shop*', '*Compressor Room*', '*Ladder Makers Shop*', '*Gas Generator*', '*Boiler House*', '*Stores*' and '*Hose Tower*'.

2.1.4 The ground floor plan of the building in the LMA shows that the north-east corner of the Engine House was built immediately adjacent to the existing '*Coppersmiths Shop*'. The Ordnance Survey maps suggest that this building was demolished between 1970 and 1990 (Page-Smith 2007, figs 17 and 18). It was probably removed when Merryweather and Sons left the Site. The building is clearly shown on the 1870 to 1970 Ordnance Survey maps and also appears to be shown on the 1830 Greenwood map and 1844 Tithe map (ibid., figs 7, 9-17). Remains of this building are still extant within the Engine House and include a doorway with a semi-circular arch over constructed of two rows of headers (**Plate 4**). It may have been originally built as part of the Tannery shown on the 1830 Greenwood map.

2.2 Block 2: Station House

2.2.1 The Station House is late 19th century in appearance (**Plates 5**-**7**). Its footprint is not shown on the 1870 Ordnance Survey map but is shown on the 1894 and later Ordnance Survey maps (ibid., figs 10-19). It is likely to have been built in or after 1876, when Merryweather and Sons established their premises on the Site. It is labelled as '*Erecting Shop*' on a plan dated June 1929 in the LMA.

2.2.2 This late 19th century workshop is built of yellow London stock brick. Its windows are mainly late 19th century metal-framed casements. Its roof is covered with 20th century corrugated asbestos with a 20th century continuous roof light along its south side.

West Wall

2.2.3 The west wall of the Station House originally had a pair of loading bay doors at ground, first and second floor (**Plates 5** and **6**). The north loading bay door at ground floor level has been partially blocked with brick in stretcher bond and a door in the late 20th century. The south loading bay door at ground floor level has a late 20th century roller door. A 20th century window has been inserted into the south loading bay door at first floor level. Original metal windows exist at first and second floor level between the loading bay doors, and an original oculus window exists above. An original iron bracket hoist exists at second floor level.

2.2.4 The brickwork is in Flemish bond. The original loading bay doors and window openings, except for the oculus window, have semi-circular heads with three courses of headers and closers down each side. The oculus window is framed by three rows of headers.

2.2.5 The wall at the south end of the west wall is a later addition (**Plate 6**). It originally formed part of an extension on the south side of the building. This extension is not shown on the 1916 Ordnance Survey map but is shown on the 1934 to 1970 Ordnance Survey maps (ibid., figs 12-17). A ground floor plan dated June 1929 for a *New Erecting Shop* in the LMA shows this southern extension as the northern part of Block 3, the Pump House. The 1990 Ordnance Survey map (ibid., fig 18) suggests that the southern

extension had been demolished by this date. The wall at the south end of the west wall of the Engine House was clearly built between 1929 and 1934 and the LMA plan shows that its southern end formed the north side of a large doorway with sliding doors. It is also shown on an elevation drawing in the LMA (labelled '*East Elevation*' although referring to the west elevation).

South Wall

2.2.6 The south wall of the Station House is comprised of eight bays. The windows at first and second floor are original, although the sills of the two windows at first floor level at the west end were raised between 1929 and 1934 to take the pitched roof of the south extension (*New Erecting Shop*). The white painted pitched roof scar of the extension is clearly visible at the west end of the wall. The window openings at first floor level have semi circular heads with three courses of headers. Most of the window openings at first and second floor level still have their original metal framed windows.

2.2.7 The ground floor of the south wall was altered when the south extension was built between 1929 and 1934. No original fabric in the south wall appears to survive at this level. Three pillars support the first and second floor. These pillars are not original because they do not line up with the bays above. They are not shown on the June 1929 ground floor plan and were probably built between 1970 and 1990 when the south extension was demolished and new occupants took over from Merryweather and Sons. The walling and paired openings between the pillars also appear to have been built between 1970 and 1990. The west wall of the south extension built between 1929 and 1934 still survives to eaves height at the west end of the south wall.

East Wall

2.2.8 The east wall of the Station House is again in Flemish bond and is comprised of four bays (**Plate 7**). An oculus window at attic level matches that in the west wall.

2.2.9 The wall at ground floor level is in a bastard bond and is a later build. It is shown on the June 1929 ground floor plan for the *New Erecting shop* in the LMA. It replaced the original ground floor wall, which is shown as a dashed line on this plan. It may have related to the building immediately to the east of the Station House, which is not shown on the 1894 Ordnance Survey map (ibid., fig 11) but is shown on the 1916 to 1970 Ordnance Survey maps (ibid., figs 12-17). The June 1929 ground floor plan for the *New Erecting Shop* in the LMA labels it as '*Weaving Shop*'.

2.2.10 It is clear that the fire escape staircase was a later addition because the doorways at first and second floor have been created from original windows. The closers either side of these doorways do not continue below window sill height. The fire escape must have been added after the '*Weaving Shop*' had been demolished between 1970 and 1990.

North Wall

2.2.11 The north wall of the Station House is again in Flemish bond and like the south wall has eight bays (**Plate 5**). Most of the late 19th century metal framed windows survive. The original semicircular heads to the windows survive at first floor level. The original brick window heads at ground floor level have been replaced with concrete lintels.

Interior

2.2.12 At ground floor level, seven square brick columns support large north-south cross beams, which in turn support the first floor above. The original open space or workshop floor has been divided up with partitions in the late 20th century to create rented offices. The arrangement is similar at first floor level, although round columns support the large north-south cross beams on this floor. At second floor level, seven queen post trusses with iron straps support the roof (**Plate 8**). Common rafters support diagonal sarking boards.

2.3 Block 3: Pump House

2.3.1 The Pump House is 1920s/30s in appearance (**Plate 9**). Its footprint is not shown on the 1916 Ordnance Survey map but is shown on the 1934 and later Ordnance Survey maps (ibid., figs 12-19). Drawings dated June 1929 for a '*New Erecting Shop*' for Merryweather and Sons in the LMA show its proposed ground floor plan, roof plan, elevations and two sections.

2.3.2 The Pump House (*New Erecting Shop*) is two storey and has a flat roof with pitched roof lights. The June 1929 drawings show that it originally was connected to the Station House with a single storey extension to the south of the Station House.

South Elevation

2.3.3 The south wall of the Pump House fronts onto Greenwich High Road and was the show elevation, with its 'Merryweather and Sons' sign, decorative brickwork and other decoration. It is built in English bond and is comprised of eight bays. Three courses of dark brown brickwork alternate with three courses of orange brickwork in the end bays. Decorative brick bands are also used in the bays between the end bays. The original metal framed windows still survive. The ground floor windows are separated from the first floor windows by decorative bands. Bull nose bricks form the sills of the ground floor windows. The heads of the first floor windows are formed of a soldier course of upright orange bricks. Closers and the 1929 drawings show that all the window openings are original.

2.3.4 The boundary walls at the west and east ends of the south wall of the Pump House are shown on the June 1929 plans and the elevation labelled '*Elevation to Greenwich Road*'. They were built at the same time as the Pump House between 1929 and 1934. They are built in dark brown brick in English bond and headers on edge over tile form their coping.

West Wall

2.3.5 The west wall of the Pump House is much plainer than the showier front (south) elevation (**Plate 10**). It is built in dark brown brick in English bond with concrete coping slabs. The original doorway is still extant at the north end of the wall. It has a soldier arch with alternating stretchers on end and two headers. Above, the original window was obscured by a sign at the time of the site visit, although its soldier arch was visible immediately above the sign. The opening above has been enlarged. Unlike the openings below, it has no closers, suggesting that it had been enlarged to the south and north. Its concrete lintel appears to have replaced the original brick arch. A hoist bracket immediately to its north was presumably added when the opening was enlarged. The enlarged opening is shown as a smaller window on one

of the June 1929 drawings (labelled '*East Elevation*' but referring to the west elevation) in the LMA.

2.3.6 The west wall continues at ground floor level to the north of the Pump House. This wall is contemporary with the Pump House and originally formed part of the building between the Station House and the Pump House. This building is not shown on the 1916 Ordnance Survey map but is shown on the 1934, 1952, 1958 and 1970 Ordnance Survey maps (ibid., figs 12-17). The ground floor plan for a '*New Erecting Shop'* dated June 1929 in the LMA shows this building formed part of the Pump House. The 1990 Ordnance Survey map (ibid., fig 18) suggests that this part had been demolished by this date. The LMA plan and elevation drawing shows that its northern end formed the south side of a large doorway with sliding doors.

2.3.7 The Pump House was extended to the west with a single storey, flat roofed brick extension. This extension is not shown on the 1934 Ordnance Survey Map (ibid., fig 13) or a 1946 site layout drawing in the LMA. It is not clear whether it is shown on the 1952 Ordnance Survey map, however it is clearly shown on the 1958 and later Ordnance Survey maps (Page-Smith 2007, figs 15-19).

North Wall

2.3.8 The brickwork at first floor level in the north wall of the Pump House is in dark brown brick in English bond with concrete coping slabs. The four pitched roof scars clearly show where the contemporary building between the Pump House and the Station House was. The windows at first floor level are original and are shown on *Section C-D* of the June 1929 drawings in the LMA. These windows have concrete lintels.

2.3.9 The June 1929 drawings show that the ground floor was originally open with piers below the valley gutters of the building between the Station House and the Pump House. These openings have been infilled with concrete block (visible internally) covered with cement render, roller garage doors and doors. This probably took place after Merryweather and Sons left the Site between 1970 and 1990, when the building between the Pump House and the Station House was demolished.

Interior

2.3.10 Seven north-south chamfered concrete cross beams support the first floor. The original staircase is still extant at the west end of the building with its metal rail with ball stops (**Plate 11**). The first floor has been divided into numerous offices with light weight partitions in the late 20th century. Internally the windows on the south front have chamfered concrete lintels and bull nose bricks to their sides.

2.4 Block 4: Brigade House

2.4.1 This single storey, flat roofed, brick building is mid 20th century in appearance (**Plate 12**). Its footprint is not shown on the 1934 Ordnance Survey map but is shown on the 1952 and later Ordnance Survey maps (Page-Smith 2007, figs 13-19). Drawings dated July 1941 for a '*Canteen*' for Merryweather and Sons in the LMA show its proposed ground floor plan, roof plan, elevations and four sections (**Figure 3**). The July 1941 block plan shows that it replaced a smaller canteen that is shown on the 1934

Ordnance Survey map but not on the 1916 Ordnance Survey map (ibid., figs 12-13). This earlier canteen and garage is shown in detail on the ground floor plan for the '*New Erecting Shop'* (Pump House, Block 3) dated June 1929. Plans of 1916 in the LMA show proposals for the earlier garage and canteen. The earlier canteen is described as a '*temporary wood and iron building*'. Clearly, the larger canteen was required in 1941 not only to replace the temporary 1916 building but also to cater for the greater number of staff employed at Merryweathers during the Second World War (1939 to 1945). The July 1941 drawings show that Brigade House had a canteen in its north-east corner, a kitchen to the west, scullery and yard in its south-west corner and a garage in its south-east corner. Its roof lights as shown on the roof plan were still extant at the time of the site visit.

South Wall

2.4.2 The south wall of the Brigade House fronts onto Greenwich High Road (**Plate 13**). When Brigade House was built, openings were cut in the existing boundary wall. This wall is in dark brown brick in English bond and headers on edge over tile form the parapet. This is the same construction as the boundary wall on the west side of the Pump House, Block 3. It was built between 1929 and 1934 when the Pump House was built. The July 1941 ground floor plan shows the existing boundary wall in dark grey and the new openings in orange (**Figure 3**). A plan dated August 1929 and an elevation (labelled *Elevation to Greenwich Road*) in the LMA shows that the boundary wall originally had a vehicle gate towards its east end and no other openings.

2.4.3 The brickwork and 1941 drawings show that between 1941 and 1952 two double doorways and a wide garage door were created in the 1929-34 boundary wall (**Plate 13**). The openings all have concrete lintels. The garage door was later blocked with brickwork in stretcher bond with two windows and a doorway at the west side. The latter was later infilled with more brickwork in stretcher bond. Red brick surrounding the east double doorway shows that it has been inserted. This double doorway has closers down its east side only. The west double doorway also has different coloured bricks down its east side and above its lintel showing that it has also been inserted.

North Wall

2.4.4 The north elevation (**Plate 12**) of the Brigade House is as shown in the July 1941 drawings (**Figure 3**). The brick wall is in Flemish bond and has been painted white. The three window openings in this elevation have their original Crittall windows. All the openings in this elevation have closers and concrete lintels. The windows have tiled sills with hard cement mortar. The doorway has its original concrete steps and metal hand rail.

West Wall

2.4.5 The west wall of the Brigade House (**Plate 14**) reuses the wall of the *New Erecting Shop* shown on the ground floor plan dated June 1929 in the LMA (see **Figure 3**). Four brick piers are visible in this wall. The piers have bull nose bricks to their sides. The piers support a concrete lintel. Recessed brickwork in a bastard Flemish bond between the piers may have infilled former openings, although openings are not shown on the June 1929 ground floor plan and openings would not have worked with the earlier canteen which was positioned immediately to the east. *Section C-D* drawing of June

1929 labels this wall as a '*temporary wall'* and it is the only wall that has been coloured on this section and the ground floor plan.

Interior

2.4.6 Original rolled steel joists (RSJs) support the flat roof, both vertically and horizontally (**Plate 15**).

2.5 Blocks 5 and 6: Siren and Bell House

2.5.1 Siren House and Bell House are mid 20th century in appearance (**Plate 16**) and are treated here as one building. Its footprint is not shown on the 1934 Ordnance Survey map but is shown on the 1952 and later Ordnance Survey maps (ibid., figs 13-19).

2.5.2 Drawings dated August 1942 for '*Alterations, 49 Greenwich High Road*' for Merryweather and Sons in the LMA show a completely different building within the footprint of Bell House to the one that currently exists. The drawings show a building that has various rooms labelled '*Machine Shop*', '*Grindery*', '*Tool Room*' and '*Pump Shop*'. These drawings show proposals for the extension to the '*Machine Shop'*. The building appears to comprise a number of buildings or extensions, some of which are two storey, some single storey, some with pitched roofs and some with flat roofs. The 1934 Ordnance Survey map (ibid., fig. 13) shows these buildings. The 1939-45 bomb damage map (ibid., fig. 14) shows that these buildings were hit by a bomb.

2.5.3 Drawings dated 1944 for '*Proposed Reinstatement of Buildings, Greenwich High Road*'' for Merryweather and Sons in the LMA show a south elevation, a cross section and a first floor plan for the extant Bell House and the northern part of Siren House. The building that fronts Greenwich High Road is shown with two storeys rather than the three storeys that currently exist. The drawings show that a '*Machine Shop*' was proposed for the ground floor and a '*Drawing Office*', '*Typing Pool*', '*Chairman's Office*', '*Chairman's Secretary's Office*', '*Buying and Costing Department*' and '*Accounts Office*' were proposed for the first floor.

2.5.4 A drawing possibly dated 1945 for '*Installation of 'Clarke' Automatic Sprinklers at Greenwich High Road*'' for Merryweather and Sons in the LMA shows again shows the extant Bell House and the northern part of Siren House. The southern part of Siren House is shown as a '*Carpenters Shop*'.

2.5.5 Drawings dated 1946 for '*Proposed Rebuilding of South East Portion of Premises at Greenwich High Road*'' for Merryweather and Sons in the LMA show elevations, sections and plans for the extant southern part of Siren House. This part of the building replaced the single storey '*Carpenters Shop',* shown on the 1945(?) *'Automatic Sprinklers'* drawing.

South Elevation

2.5.6 The south elevation of the Siren and Bell House fronts onto Greenwich High Road. The building is built around a public house (now *Bar Restaurant 57*, formerly the *Rose of Denmark),* which is shown on the 1870 Ordnance Survey map (ibid., fig. 10). The 1940s drawings in the LMA show that the southern part of Siren House to the east of this 19th century building was built after Bell House to the west of the public house and the northern part of

Siren House. Both parts of this three storey building, either side of the public house, are similar. They are built of dark brown brick in English bond with Crittall windows. The windows all have closers and have concrete sills and lintels, mostly painted white. The entrance makes a statement with its windows above emphasised by vertical lines and clock above, in an Expressionist architectural style (**Plate 17**). The drawings in the LMA suggest that the second floor was added later. Slight changes in the colour of the brickwork support this suggestion. Between the windows to the first and second floor, the upper six courses of brickwork are slightly different to those below. In addition, brickwork at the west side of the entrance tower has been added to form the east side of the easternmost second floor window and a ragged vertical joint is visible.

West Elevation

2.5.7 The three storey west elevation continues in the same style as the south elevation with Crittall windows and dark brown bricks in English bond (**Plate 18**). Header bond has been used to form the curved south-west corner. At the very north end of the west elevation, lighter coloured bricks (orange and red) have been used. Again, the second floor appears to have been added later and the upper six courses of brickwork in the band between the first and second floor windows are in a slightly different colour.

North Elevation

2.5.8 The north elevation is mainly two storey, and only three storey at its very west end, providing more evidence that the third storey was added later (**Plate 19**). The north elevation was constructed in orange/red bricks in contrast to the dark brown bricks in the more visible south and west elevations. The Crittall windows have unpainted concrete sills and lintels. The brickwork in this elevation is mainly in English bond with header bond used to form the curved north-west corner around the staircase.

East Elevation

2.5.9 The east elevation is mainly three storey and two storey at its north end (**Plate 20**). The drawings in the LMA show that the southern part (south of the staircase entrance) was added after the northern part. These drawings also show that the third storey was added to the existing two storey (northernmost three bays). The southern part of this elevation is in dark brown bricks and the northern part is in orange/red brick to match that of the south and north elevations respectively. The change in brick colour does not mark a change in the development or phasing of the building. More expensive bricks were used on the visible elevations and cheaper bricks were used on the rear elevations. This elevation again contains Crittall windows with concrete lintels and sills. The brickwork is in English bond. Bullnose bricks have been used at the sides of the loading doors. A later doorway has been inserted at ground floor level, to the south of the staircase entrance.

Interior

2.5.10 Reinforced concrete posts support reinforced concrete cross beams that support the first and second floors. The staircases within the building are constructed of concrete and have metal hand rails.

2.6 Toilet Block 7 (north-east of Brigade House)

2.6.1 This small building was last used as a toilet block. It was built against the rear (north) wall of the White Swan Public House (85 and 87 Greenwich High Road), which is shown on the 1894 and later Ordnance Survey maps (ibid., figs 11-19). The date of construction of the toilet block is not clear from a study of the Ordnance Survey maps presented in Page-Smith (2007) mainly because its north, east and south walls form part of the Site boundary and the small scale of the maps. However, the building is shown on drawings dated 1916, 1929, 1941 (**Figure 3**) and 1944 in the LMA, and is labelled as '*M & S* (Merryweather and Son) *Lavatory*' on the 1916 plan and '*Womens Lavatory*' on the 1929 plan.

2.6.2 The north side of its west wall (**Plate 21**) formed part of the '*Weaving Shop*' shown on the 1929 plan, which existed between 1916 and 1990 (see Section 2.2.9 and 10). White paint on this part of the wall suggests its internal use. A straight joint is visible between the brickwork at the north end of the west wall of the toilet block and the boundary wall to the north. Closers down the toilet block wall suggest that this wall is earlier than that to the north. The brick pier down the centre of the toilet block formed the east end of the south wall of the '*Weaving Shop*'.

2.6.3 The upper part of the east wall of the toilet block is built of reused bricks in Flemish bond. Some of the bricks are dark brown, some are yellow and internally some have been painted white. The window and doorway have a large concrete lintel and dark brown brickwork in Flemish bond below the window. Internally, there is some late 20th century concrete block partitioning and some earlier timber partitioning. The building appears to have been partially rebuilt or greatly altered in the late 20th century.

2.7 Toilet Block 8 (north-west of Station House)

2.7.1 This small building is not shown on the 1916 Ordnance Survey map but is shown on the 1934 and later Ordnance Survey maps (Page-Smith 2007, figs 12-19). The maps show that this building was sandwiched between two earlier buildings.

2.7.2 The building that once existed immediately to the north of the toilet block is labelled as '*Existing Welding Shop*' on the 1949 ground floor plan for the Engine House. Its northern end was the '*Coppersmiths Shop*', remains of which are still extant within the Engine House (Section 2.1.4). The Ordnance Survey maps show that this building was demolished between 1970 and 1990 (ibid., figs 17 and 18). It was probably removed when Merryweather and Sons left the Site. The building is clearly shown on the 1870 to 1970 Ordnance Survey maps and also appears to be shown on the 1830 Greenwood map and 1844 Tithe map (ibid., figs 7, 9-17). Remains of this building are still extant. Its south wall forms the north wall of the toilet block (**Plate 22**). The white paint on this wall suggests its former internal use. The wall is in English bond. A window in this wall with a semi circular arch formed of three rows of headers has been partially blocked with brick and converted into a doorway. The east wall of the '*Welding Shop'* now forms the Site boundary wall and is also painted white from its internal use. The '*Welding Shop'* may have been originally built as part of the Tannery shown on the 1830 Greenwood map.

2.7.3 The building that once existed to the south of the toilet block is shown on the 1944 '*Site Layout Plan*', but is not labelled. The Ordnance Survey maps show that this building was demolished between 1970 and 1990 (ibid., figs 17 and 18). It was probably removed when Merryweather and Sons left the Site. The building is clearly shown on the 1870 to 1970 Ordnance Survey maps and also appears to be shown on the 1830 Greenwood map and 1844 Tithe map (ibid., figs 7, 9-17). Remains of this building are still extant, but its north wall does not form the south wall of the toilet block (**Plate 23**). This wall has been rebuilt with reused yellow bricks in a bastard Flemish bond. Some of the bricks have white paint on them. The east wall of the former building to the south of the toilet block still exists as the Site boundary wall. This wall is painted white from its internal use and contains two blocked windows with semi circular arches formed of two rows of headers (**Plate 5**). To the north of these windows is a large blocked doorway with a concrete lintel (obscured by the portacabin in **Plate 5**). This former building may have been originally built as part of the Tannery shown on the 1830 Greenwood map.

2.7.4 The west wall of the toilet block is covered with cement render. At its north end this wall butts against the earlier north wall of the toilet block.

2.8 Wall 9 (west of Engine House)

2.8.1 Blocked openings in the brick wall to the west of the Engine House show that it was originally part of an earlier building. The Ordnance Survey maps show that this building was demolished between 1970 and 1990 (ibid., figs 17 and 18). The building is shown on the 1894 to 1970 Ordnance Survey maps (ibid., figs 11-17). The building appears to have been constructed as part of the tram depot, which was established next door to Merryweathers.

2.8.2 The south wall of this building is built in Flemish bond in dark brown brick (**Plate 24**). Three window openings in this wall have concrete sills and lintels.

2.8.3 The east wall of this building is described from south to north. The southern end of this wall is painted white (east side) and has been partially rebuilt with concrete block (**Plate 25**). Two window openings in this part of the wall have concrete sills. One of the windows is partially blocked with brick. A change in height of the wall marks the north side of a first floor window opening.

2.8.4 The wall beyond the white painted section is constructed mainly of yellow brick in English bond. Four small openings in this part of the wall have semicircular soldier arches (east side) (**Plates 25** and **26**) and arches constructed of three courses of headers (west side). These openings have been blocked with brickwork in stretcher bond. Beyond, there is a doorway with a semicircular brick arch formed of two rows of headers (east side) and three rows of headers (west side). Closers down both sides of the doorway (east side) suggest it was an original opening. This doorway has also been blocked with stretcher bond brickwork. Two smaller doorways to the north with semi circular arches with three courses of headers (west side) have no closers and may have been inserted. A larger doorway to the north with a semicircular soldier arch (east side) and an arch constructed of three courses of headers (west side) also has no closers and may have been inserted. A further doorway with a semi circular soldier arch (east side) and

and an arch constructed of three courses of headers (west side) has rebuilt sides. There is then a straight joint in the wall and the wall continues with the lower part of two openings at first floor level more clearly visible on the west side. This part of the wall is supported by brick piers on both sides. Beyond a ragged vertical joint, a late 20th century brick wall continues in yellow brick in English bond with a hard cement mortar.

3 DISCUSSION

3.1.1 The building recording showed that remains of buildings possibly shown on the 1830 Greenwood map and associated with the Tannery shown on that map were still extant at the time of the site visit. These remains had become incorporated into Engine House Block 1, Toilet Block 8 and the boundary wall to the north of Station House Block 2 (**Figure 2**). The Station House (*Erecting Shop*) appears to have been built in 1876 when Merryweather and Sons established their business on site. A boundary wall to the west of Engine House Block 1 contained blocked window and door openings and represents the remains of a Tram Depot building which had been built by 1894.

3.1.2 Pump House Block 3 was built between 1929 and 1934 as the '*New Erecting Shop*'. This building originally connected with the south side of the Station House '*Erecting Shop*'. Brigade House Block 4 was added as a '*Canteen*' to the east side of the Pump House between 1941 and 1952. It replaced a smaller canteen, presumably to cater for the increase in staff at Merryweathers during the Second World War (1939-45). Bombing during the war appears to have resulted in the construction of Bell House Block 6 and the northern part of Siren House Block 5 between 1944 and 1952. Between 1946 and 1952, the southern part of Siren House Block 5 was built. Possibly at the same time, or a bit earlier, a third storey was added to Bell House Block 6. Between 1949 and 1958, Engine House Block 1 replaced earlier buildings on the Site.

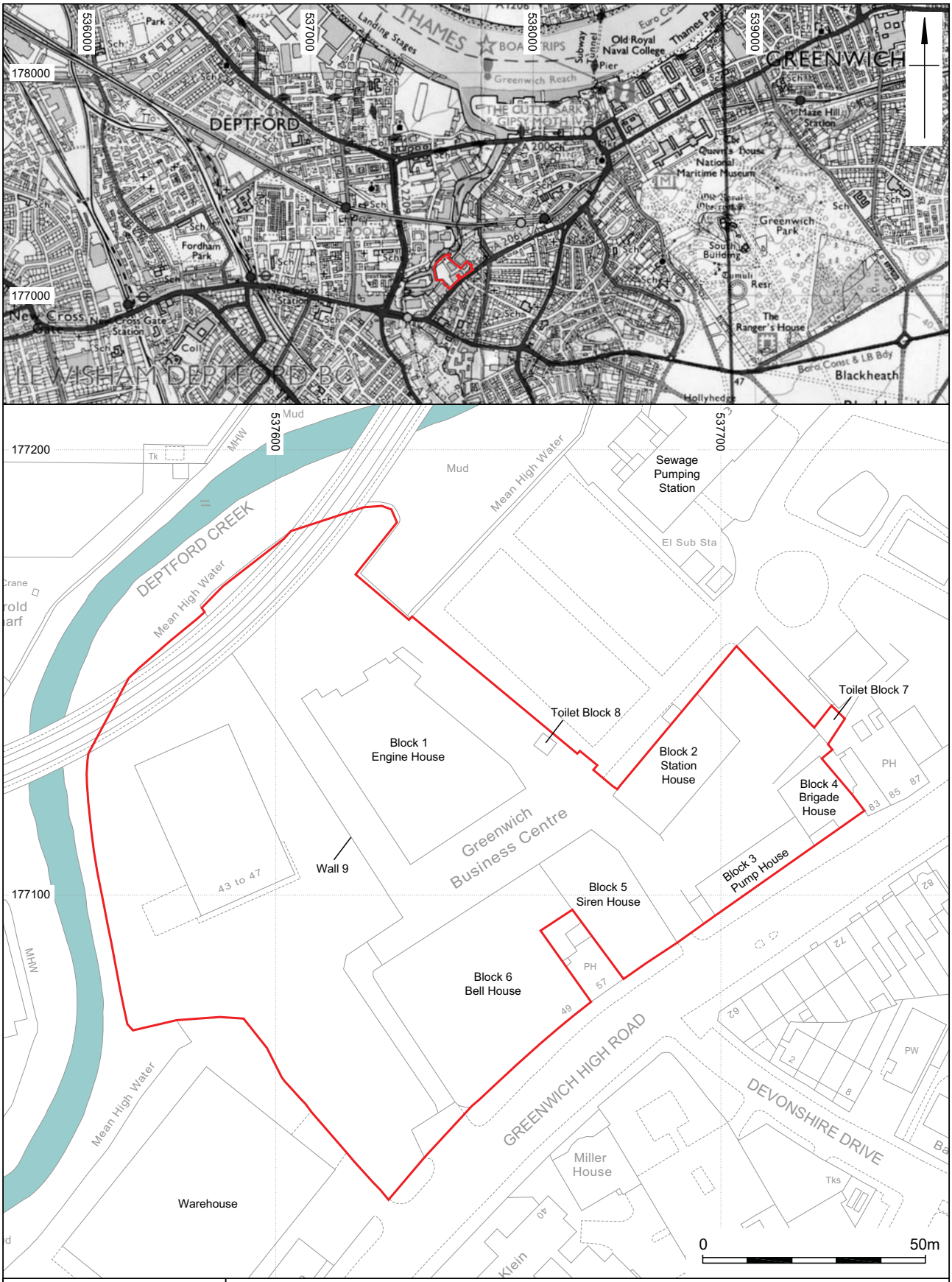
4 ARCHIVE

4.1.1 The project archive is currently held at the offices of Wessex Archaeology in Salisbury, Wiltshire under the project reference 68660. It is anticipated that the archive will be deposited with the London Metropolitan Archives.

5 BIBLIOGRAPHY

Page-Smith, K. 2007 *Archaeological Desk Based Assessment: Land at 43-81 Greenwich High Road, SE10, London* Unpublished Client Report, Oct 2007.

Wessex Archaeology 2008 *Written Scheme of Investigation for Historic Building Recording: 43-81 Greenwich High Road, London Borough of Greenwich* Unpublished Client Report, Ref T11689 Feb 2008.



Site boundary

WA Heritage

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Site location

Figure 1

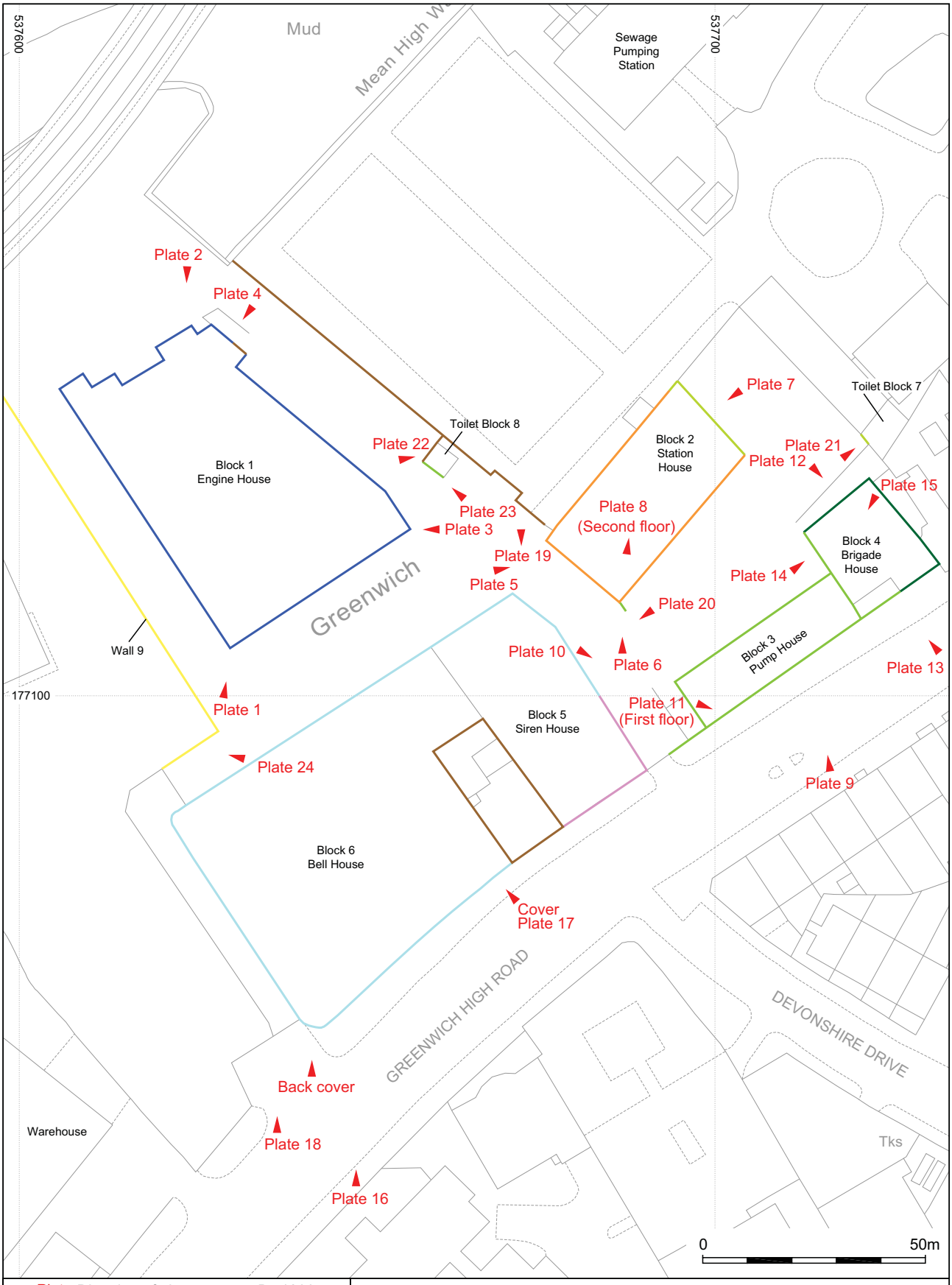

Plate Direction of plate

- By 1830
- 1876
- By 1894
- By 1916
- 1929-1934
- 1941-1952
- 1944-1952
- 1946-1952
- 1949-1958

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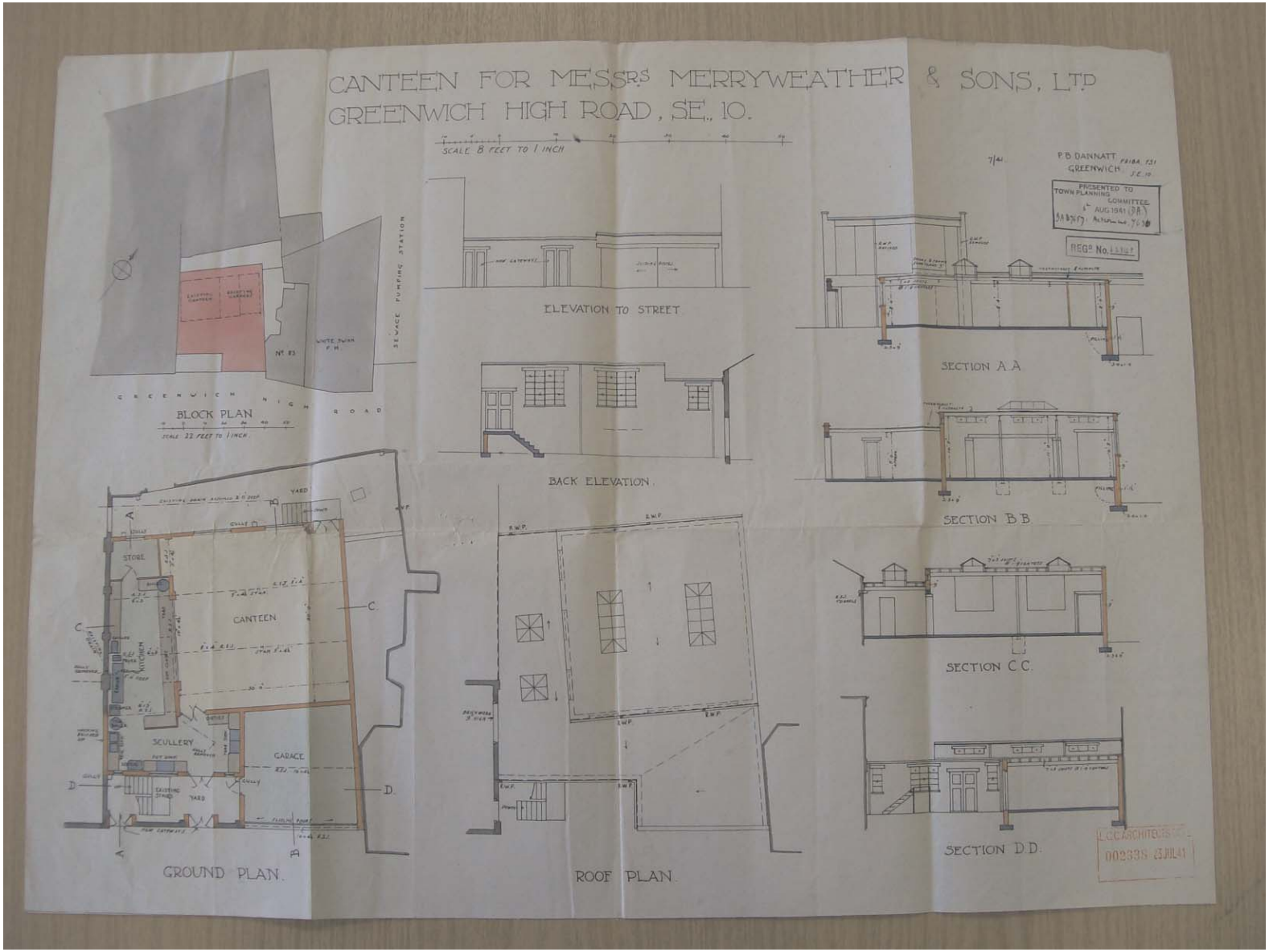
Phased site plan showing direction of plates

Figure 2



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July 1941 Proposal Drawings for Brigade House in the London Metropolitan Archives

Figure 3

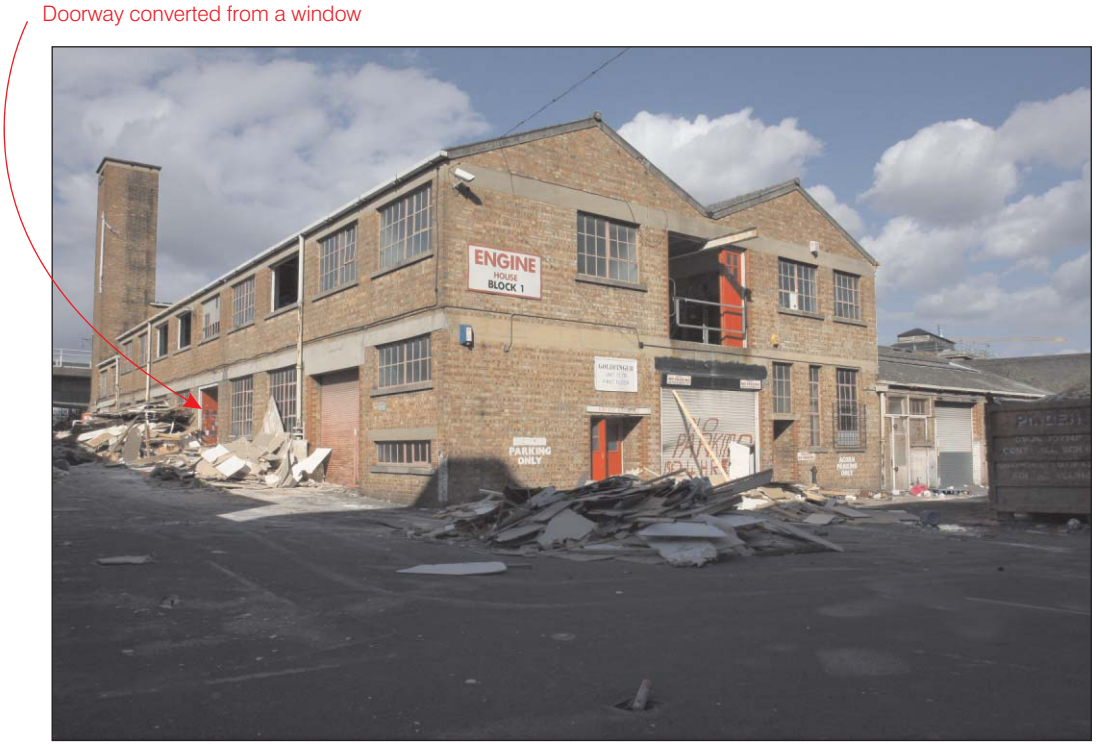

Plate 1: South and west elevation of the Engine House

Plate 2: North elevation of the Engine House

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Plate 3: South and east elevations of the Engine House

Plate 4: Remains of 19th century building incorporated within the Engine House

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Plate 5: North and west elevations of the Station House

Plate 6: West and south elevations of the Station House

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Plate 7: East elevation of the Station House

Plate 8: Queen post truss roof in the Station House

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Plate 9: South elevation of the Pump House

Plate 10: North and west elevations of the Pump House

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Plate 11: Metal staircase rail in the Pump House

Plate 12: North elevation of Brigade House

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Plate 13: South wall of Brigade House

Plate 14: West wall of Brigade House

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Plate 15: Interior of the canteen in the Brigade House

Plate 16: West and south elevation of Bell House and Siren House

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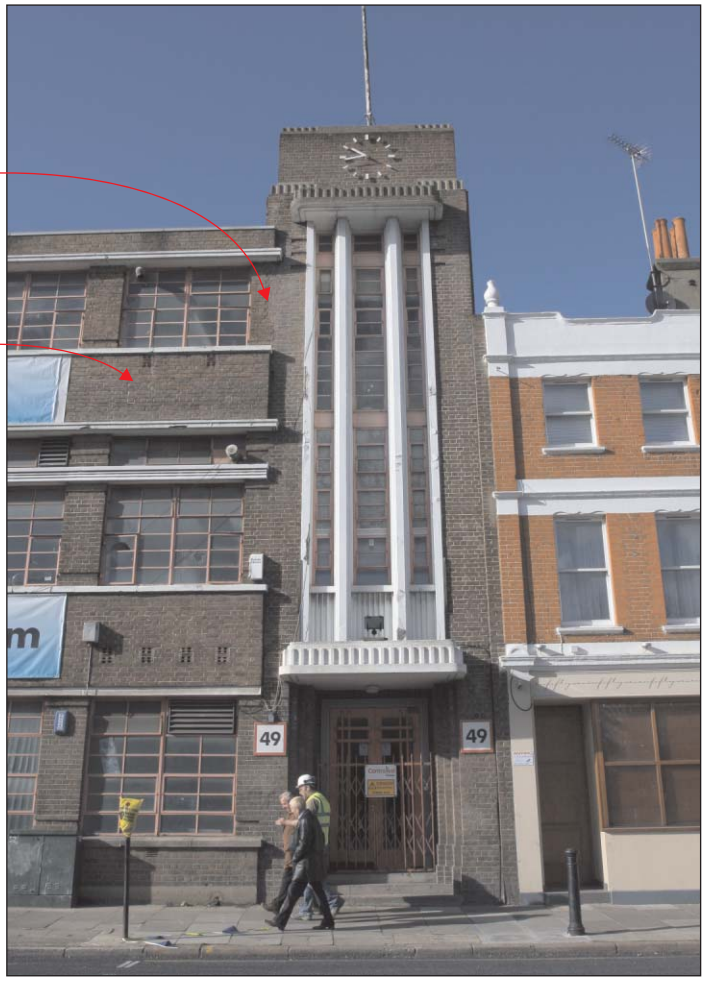

Plate 17: Bell House entrance

Plate 18: West elevation of Bell House

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Plate 19: East and north elevation of Bell House and Siren House

Plate 20: East elevation of Siren House

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Plate 21: West wall of Toilet Block 7

Plate 22: North and west wall of Toilet Block 8

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Plate 23: West and south wall of Toilet Block 8

Plate 24: South side of wall 9

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Plate 25: East side of wall 9

Plate 26: East side of wall 9

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