PLANNING DELIVERY ZONE 6
Trench PDZ.6.01
London E15

London Borough of Newham

Post-excavation assessment

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MUSEUM OF LONDON Archaeology Service
PRE-CONSTRUCT ARCHAEOLOGY

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Project Manager	Kieron Tyler
Authors	Alistair Douglas
	Graham Spurr
Graphics	Judit Peresztegi
	Mark Roughley

Museum of London Archaeology

Mortimer Wheeler House, 46 Eagle Wharf Road, London N1 7ED
tel 020 7410 2200 fax 020 7410 2201
molas@museumoflondon.org.uk
www.musemoflondonarchaeology.org.uk

PCA

Unit 54, Brockley Cross Business Centre, 96 Endwell Road, Brockley, London SE4 2PD
tel 020 7732 3925 fax 020 7732 7896

Executive summary

This report presents the results of excavation work undertaken within Trench PDZ6.01 within the Olympic park. The work was undertaken by the Museum of London Archaeology Service and Pre-Construct Archaeology (MoLAS-PCA) within the area of the Olympic, Paralympic and Legacy Transformations Planning Applications: Planning Delivery Zone 6, London Borough of Newham, London E15. The report was commissioned from MoLAS-PCA by the Olympic Delivery Authority (ODA).

As a result of evaluation it was determined that the archaeological sequence within Trench PDZ6.01 was of sufficient significance to require further investigation. Excavation followed on immediately from evaluation. The result of the mitigation work has helped to refine the initial findings and so assist in our better understanding the archaeological potential of the area.

The earliest phase within the excavation was represented by the late Pleistocene/early Holocene drift geology in the form of gravels was observed at c 1.18m OD and overlying silty sands at between 2.24m OD and 1.62m OD. A sequence of alluvium with peat c 1.50m thick covered the natural sands and peats. Within the alluvium, silted up channels were recorded. A few sherds of medieval pottery were recovered from the alluvium, which overall was deposited over a long period: from the late Bronze Age/early Iron Age to the medieval period. The site area was within a wetland environment for this lengthy period.

The first use of the marsh was represented by a linear timber pile structure that may have supported an elevated walkway that traversed the waterlogged area. This was dated to the late 16th or early 17th century.

By the 17th century the marsh had been reclaimed and the archaeological evidence suggests that there was a mill close by which supplied power for a metal-working furnace. The excavation unearthed a narrow stream reveted with timber that was probably a millrace and the remains of a brick built building, within which were the remains of a furnace.

A water channel was present on the east side of the site, the west bank of which was reveted as early as the 17th century. This channel has been identified as the historically documented Tumbling Bay Stream, a waterway that remained open until the early 20th century. Evidence was also unearthed for a tie-back that would have connected to a revetment to the west and beyond the limits of the excavations. This revetment would have been part of the waterfront of the Temple Mills Stream.

The metal working mill appeared to have been demolished in the 18th century and the site remained open until probably the late 18th century when it became part of the ground of a calico printing works. A row of terraced cottages that was probably originally built to house workers for the calico works was revealed on the western side of the excavations. The remains of probably two other commercial/industrial buildings were also found.

In the 19th century the west bank of the Tumbling Bay Stream was rebuilt and the ground level across the site raised and a cobbled road and stone pavement laid.

The site has provided a unique opportunity to archaeologically investigate and record the buried landscape of the lower Lea valley and to discover an important early post-medieval industrial and later residential site.

The presence and preservation of archaeological horizons; features; organic remains and palaeoenvironmental evidence suggests that the site has a high archaeological significance and high geoarchaeological significance in understanding the natural and cultural formation and change of the lower Lea Valley. Tying the stratigraphic information from PDZ6.01 in to the information recovered from the surrounding area, when linked to historic map evidence and dating, will contribute to our understanding of the evolving river regime of the Lower Lea.

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1 Introduction

1.1 Site location

The excavation took place in land to the east of the River Lea in the north-west of Planning Delivery Zone 6 (PDZ6) of the Olympic, Paralympic and Legacy Transformations Planning Applications, in the London Borough of Newham (Fig 1).

The zone as a whole is bounded on the west by the River Lea, on the east by the former Eastern Counties Railway line from Stratford to Cambridge, on the north by Temple Mills Road and on the south by Temple Mills Lane and the channels of the Channelsea River at the south-western corner.

The Temple Mill Trench – Trench PDZ6.01 - is hereafter called 'the site'. The OS National Grid Reference for the centre of the excavation area is 537601 185476.

1.2 The scope of the project

This report was commissioned by the Olympic Delivery Authority (ODA) and produced by the Museum of London Archaeology Service and Pre-Construct Archaeology (MoLAS-PCA). The report has been prepared within the terms of the relevant Standard specified by the Institute of Field Archaeologists (IFA 2001). The project covers the excavations carried out at Trench PDZ6.01 in the Olympic Park, which shall hereafter be referred to as 'the site' (Fig 1).

This post-excavation assessment describes the results of archaeological excavation, undertaken by MoLAS-PCA. This report assesses the data recovered from the excavation and thus measures the archaeological potential of the site.

The aim of the project is to assess the archaeological significance of any findings made during the above works and understand them in their wider context, whether local, regional, national or international. The proposed analysis and publication project will address those issues raised in the project research aims whilst integrating local archaeological knowledge from other excavations in the immediate and surrounding area. This post-excavation assessment report incorporates specialist reports on pottery, clay tobacco pipe and pipe clay, ceramic building material and stone, glass, registered finds, iron slag and related debris, leather, timber and animal bone. The environmental and geoarchaeological aspects of these inputs are incorporated into a specific section of this report (section 5.12 Environmental samples and geoarchaeological records).

Reference should be made to the preceding desk-based assessment undertaken for the whole of PDZ6 (MoLAS-PCA 2007a).

Archaeological survival was apparent early on, and the evaluation was refocused to be become an excavation due to time constraints on the contractor's and development programmes. The move to excavation was undertaken with the approval of English Heritage's Greater London Archaeology Advisory Service on 6 May 2008. The excavation was targeted towards further understanding of these areas of survival.

Therefore, all the fieldwork was undertaken within the remit of the *Written Scheme of Investigation for Archaeological Evaluation* (MoLAS-PCA 2008).

1.3 Circumstances and dates of fieldwork

The legislative and planning framework in which the archaeological exercise took place was summarised in the *Written Scheme of Investigation for Archaeological Evaluation* (MoLAS-PCA 2008).

In accordance with local and national policies an archaeological evaluation was required in advance of the redevelopment as part of the planning process. The works were undertaken between 6 May and 2 July 2008.

The site was a rectangular: 35m north-south by 25m east-west, and 875m². Within this area four stepped trenches (Trenches 1-4, see Fig 2) were dug.

- Trench 1 was located in the south-west corner and measured at maximum 5.0m x 4.80m x *c* 3.0m (max) deep.
- Trench 2 was in the northwest corner and measured at maximum 5.0m x 3.50m x *c* 1.20m deep.
- Trench 3 in the central part of the site measured at maximum 22m east-west x 5.50m (max) east-west x *c* 3.0m (max) deep.
- Trench 4 in the southern half of the site measured at maximum 16m north-south x 15.50m east-west (max) and had a maximum depth of *c* 2.85m (max).

It should be noted that as each of these trenches had stepped sides, each trench became progressively smaller in plan with depth. Therefore, the outlines of each trench as presented on the figures in this report are not uniform, but representative of the dimensions at the depth that the illustrated features were uncovered. The maximum plan dimension of each trench (ie at its top level) are seen on Fig 2.

Modern ground level was approximately 12-12.5m OD. Up to 9m depth of post-1850 fill lay below this level underneath which lay, in turn, the levels of archaeological survival. Therefore, the site was excavated within a sheet-piled cofferdam supported by braces. The cofferdam was installed by Morrison Construction Limited. Two scaffold stair towers were erected to enable safe access to the base of the excavation.

Mass ground reduction to the levels of archaeological survival was not monitored for the upper 7m thereafter it was under archaeological supervision until the archaeological horizon was encountered. The final reduction to the top of the archaeological deposits was excavated using a toothless ditching bucket.

When it became impractical to excavate all of the spoil from the top of the trench a 20-tonne excavator operated within the confines of the cofferdam with dumper trucks to move the spoil to the edge of excavation where a long-reach excavator removed the spoil to the surface. During the excavation, a small seven-tonne excavator and dumper were retained to aid the archaeologists in the removal of homogeneous of 'low grade' deposits.

Gas detectors monitored air quality and water pumps removed excess water so as to create a safe working environment.

The archive comprises: one electronically surveyed overall trench plan, 435 single context plans also at a scale of 1:20 and 51 sections at a scale of 1:10 . 1093 context records were allocated. The site finds and records have been allocated the site code OL-06507.

1.4 Organisation of the report

The *Post-excavation assessment* is intended to sum up what is already known and what further work will be required to reach the goal of a well-argued presentation of the results of recording and analysis.

The principles underlying the concept of post-excavation assessment and updated project design were established by English Heritage in the *Management of Archaeological Projects 2* (MAP2), (1991).

This document details the work undertaken on the assessment of the site sequence (section 4), for the assessment of the archive (section 5). It compares observations with the original research aims (section 6.1) and discusses the site's wider significance (section 7).

As part of the *Post-excavation assessment*, the analysis has resulted, in terms of the report, in elements of the excavation being referred to by (eg [100]). Each is an unique numerical reference, within its type, which relates to a specific element of the excavation. See Appendix 1: Context index for listing

2 Historical and archaeological background

The following summary of the geological and archaeological background to the site is based upon the desk-based assessment for PDZ6 (MoLAS-PCA 2007a)

2.1 Topography

PDZ6 is located on the eastern side of the floodplain (valley bottom) of the Lea Valley, to the east of the Waterworks River, which forms the western boundary of the zone. The site is located in the north-west part of PDZ6. The Channelsea River and Henniker's Ditch flow across the northern and western parts of the zone. The extent to which these rivers are man made or originally natural is not yet known. The straight course of Henniker's Ditch suggests that, if formerly a natural watercourse, it has been extensively canalised.

2.1.1 Modern ground level

Ground level in the north-west part of the PDZ6 has been greatly raised in recent times by extensive land fill and at the site modern ground level is at *c* 12.50m OD.

2.1.2 The buried landscape

The British Geological Survey Sheet 256, North London shows that the site lies on alluvium, which represents a range of different wetland and dryland environments existing on the valley floor (floodplain) of the Lea. The alluvium is underlain by the Lea Valley Gravels, deposited following the scouring-out of the valley floor during the Palaeolithic period (the Pleistocene). The gravels are the most recent in a series of Pleistocene river terrace deposits, which today form an irregular flight of steps in the valley side. The Kempton Park Gravels and older Taplow Gravels form the lowest of these river terraces, at the edge of the valley and within the eastern limits of the zone.

Underlying the gravels is the tertiary bedrock, which in the area of the site comprises London Clay and Woolwich and Reading Beds.

In the area of the site the buried topography has been identified as an irregular surface formed by a mosaic of islands and channels.

Silted up paleo-channels may dissect this part of PDZ6 and the site. These abandoned channels form probable tributaries of the River Lea and may have been predecessors of the Channelsea River and Henniker's Ditch.

2.2 Prehistoric

Areas of marsh prior to reclamation in the late medieval/early post-medieval period would have had an environment rich in resources and would have been readily exploited by the local population for hunting, fishing, grazing, and collecting wild plants for food, and medicinal purposes and cutting reeds for basketry and thatching. Any areas of slightly higher and drier land within the marsh are likely to have been foci for settlement.

Evidence for prehistoric activity has been found on sites around PDZ6. To the south of the zone at Stratford Box (SBX00) a layer of wood chips was found dated to the late Iron Age and a number of Bronze Age cut features were excavated. At Carpenters Road (OL-00105), *c* 400m to the south of the zone, a peaty land surface of Neolithic date contained butchered animal bone and a piece of worked wood dating to the Bronze Age was also found.

On the northern margins of the zone, on a site at Temple Mills Lane in 1975, human remains and a timber structure that could date to the prehistoric era were discovered.

2.3 Roman

A number of potential Roman crossing points have been identified across the Lea Valley, both north and south of the zone and possibly within the zone itself. For example the GLSMR (LO1685) records a Roman road on the northern border of the zone based on an antiquarian observation in 1797, when a causeway was reportedly discovered along with Roman finds during works at Temple Mills. Its alignment is not known. It is possible that the road was an extension of a conjectured minor road that may have existed along the line of Ridley Road and Homerton High Street to the east, which may have extended to a crossing point at Temple Mills. However, the evidence for this Roman road has previously been examined and it has been concluded that it is unlikely to have existed (Tyler 1998).

In 1722, the author Daniel Defoe mentions a great stone causeway, which continued over the present site of Temple Mills to Ruckholts. The GLSMR places the discovery *c* 750m north of the zone of PDZ6, although it is not known why it is positioned here, so far north of either Temple Mills (on the edge of the zone) and Ruckholt Manor *c* 400m to the north-east. The relationship between the causeway and the aforementioned road within or immediately north of the proposed development is not clear: the causeway is not securely located and it is possible they represent part of the same road.

2.4 Medieval

In 1185 William of Hastings, Steward to Henry II granted a tract of meadow and marsh beside the River Lea in Hackney and Leyton to the Knights Templar (Baker 1995, 92-101; Powell 1973, 197-205).

By the late 1270s the Templars had established a watermill on their Leyton estate, to which they added a second mill built under the same roof but situated in Hackney. Following the suppression of the Order at the beginning of the 14th century the mills and the estate passed to the Hospital of St John of Jerusalem, Clerkenwell, in whose hands it remained until that Order was dissolved in 1540.

2.5 Post-medieval

2.5.1 History of the mill complex

Preliminary historic research by Guy Thompson summarised below complements the archaeological record of successive change at the site ,and has indicated the nature of the mill complex and changes in land use at specific dates.

The Tumbling Bay Stream appears to have originated as the weir channel through which water from the Temple Mills Stream bypassed the easternmost of the two Temple Mills.

After the dissolution the former Templar estate was appropriated by the Crown, returning briefly to the reconstituted Order during the reign of Queen Mary, after which it reverted to the Crown following the accession of Queen Elizabeth in 1558.

Seventeen years later the Crown leased the 'the two mills called Rokeholte alias Temple Mills under one roof' and 7 acres of land in Hackney to Edward Bigge for a term of 40 years (TNA ELR 14/752, 1575-6). Little is known about Bigge's occupancy, though it is clear that he did not profit from the mills for the full term of his lease, for they had reverted to the Crown at some point before 1593. That year the Crown leased the mills together with a former leather mill on the site to Clement Goldsmith, also for a term of 40 years (ibid).

A lease of April 1601 describes the property as comprising the two mills under one roof, several acres of meadow, one house and garden and 1 acre of osier ground, together with a plot 'wherein a Little Water Mill sometime stood with the watercourses sometime belonging' to George Bromley for the 19 years remaining of his lease (Hackney Archives: M793, 2nd April 1601). This lease also made reference to a Powder Mill, which stood adjacent to a number of houses, outhouses or barns. Given that the latter mill was in existence when Bromley acquired the premises, it is unlikely that it was the same structure as the 'Little Water Mill', which had already fallen out of use. It is therefore conceivable that this Powder Mill represented a fourth mill, situated on Bromley's plot somewhere between the Shire Stream and the Tumbling Bay Stream.

In 1633 or thereabouts the Crown sold its interest in the mill complex to Richard Trafford, whose son John formally leased them to Baker in 1637 (Baker, 1995: 92-101). Though Baker was using his mills to grind mainly starch, oil and smalt at the end of the 1630s (Powell, 1973: ibid), by the beginning of the following decade at least one of the mills was being used to produce gunpowder.

At the end of January 1649 the property comprised (Hackney Archives: M796, 10th August 1668):

'…all those two Watermills Ruckholt Mill alias Temple Mill on the Sheare Stream with all and singular the rights unto belonging. And also the messuages, tenements, buildings… lying near unto the said mills… and the lands, meadows, pastures or to any belonging to the tenure of Abraham Baker together with one parcel of meadow ground or pasture lying near the said mill containing 1½ acres in the tenure of Martha Bennett also Nicholls then in the tenure or occupation of Abraham Barker. And also the 7 acres of meadow lying in meadow with appurtements to the said Mills also belonging, in the tenure of John Trafford and the rentals together with the rents thereunto' (ibid).

In 1675 the Crown leased the 'the two mills called Rokeholte alias Temple Mills under one roof' and 7 acres of land in Hackney to Edward Bigge for a term of 40 years (TNA ELR 14/752, 1575-6).

One or more of the mills was used by a company established in the 1690s to manufacture brass kettles and tin and latten plates; this company was still active in 1720 (Lysons, 1796: 182).

By the third quarter of the 18th century the estate had been formally divided into two holdings that descended separately thereafter. The smallest of these comprised Flagery Mead and the 1½ acre osier ground (Hackney Archives M1420, 2nd March 1769).

By the early 1830s the estate comprised three elements:

- the first and most substantial of which included the freehold interest in the mills and waterwheels at Temple Mills, 'the benefit of the whole stream of water issuing out of the Navigable River leading to and carrying and driving the said Mills' (i.e. the Shire Stream) and a two-acre meadow a short distance to the north-west of the main mill complex known as Cutler's Mead (LMA ACC/2558/EL/A/02/B/21/06, East London Waterworks Company, 12/12/1834). The proprietors leased the mills to the Milled Lead Company (in which they also had an interest), which manufactured sheet lead at the premises throughout the second half of the 18th century (Lysons, 1796: 182; Lysons, 1795: 450).
- The second part of the estate comprised: 'that parcel of Land called an Osier Hope upon which a Water Mill was heretofore built and now stands and also said Water Mill and the water running to the said mill and the course of way going to the said Mill and thereunto belonging one little parcell [sic] of land lying on the east part containing one rood more or less adjoining to a Mead of the late Stephen Skinner senior called Gunn Mead with the appurtenances lying near Temple Mills in the Parish of Westham' (LMA ACC/2558/EL/A/02/B28/003/01-7, Copy admition [sic] of Mr Richard Trowbridge and others, 26th May 1755). A plan produced to accompany a lease of 1834 indicates that the 'Osier Hope' was situated towards the southern end of the spit of land between the Tumbling Bay Stream (i.e. 'the water running to the said mill') and the Shire Stream, where the third mill mentioned in 1601 had probably stood.
- The third part of the estate consisted of the remaining freehold land and premises between the Shire Stream and the Temple Mills Stream, plus an irregular four-sided plot of just over 1 acre immediately to the south. When the proprietors leased the estate to the East London Waterworks Company in 1834, this parcel was described as containing '4 acres and a messuage and a dwelling-place' used as a calico ground, a calico-printing works comprising 'two Dye Houses, Printing and Copperplate Houses, Carthouse and buildings over the same', together with 'six messuages situate at the outside of the entrance to the aforementioned grounds and premises' (LMA ACC/2558/EL/A/33/020, May 1834). It is these grounds, works and cottages, together with the former Osier Hope that form the focal point of the present archaeological investigation.

2.5.2 Calico-printing and flock-making at Temple Mills c *1772-*c *1834*

The earliest calico grounds recorded at Temple Mills were described as being situated on the Leyton side of the parochial boundary in 1772 (Baker, 1995: 92-101). In May 1780 Henry, George and James Batt, described as calico printers of Temple Mills, insured their copper house, printing shops, lofts, stables, utensils and stock for £600, which they reinsured for £800 just over a year later (Guildhall MS 11936/283/429074, 26th May 1780; MS 11936/293/445765, 14th July 1781).

In 1793 the leasehold of a calico printing works belonging to John Francis Morier at Temple Mills was advertised for sale in The Times:

'a spacious well-constructed calico, printing house, mill house, workshops, pencilling rooms, madder house, counting house, outhouses large yards and stabling, convenient dwelling house, offices and garden adjoining with extensive bleaching grounds, seven brick dwelling houses and gardens to each eligibly situated at Temple Mills… in the occupation of Mr John Francis Morier, calico printer. The above estate is held at a ground rent of £341/13s per annum, which is more than paid by the seven dwelling houses exclusive of the principal dwelling house, manufactory, bleaching grounds &c…' (The Times, 23rd November 1793).

It would appear that the majority of the industrial structures were standing by 1771 (after which calico grounds are first recorded at Temple Mills), while the cottages (the dwelling houses noted above) may have been erected at some point between that date and 1793 (the earliest unambiguous reference to the recently excavated cottages dates to 1821).

It is possible the complex may have been inactive for a few years, as at some point between 1821 and 1828 a William Mullinger leased the calico grounds and works previously in the occupation of Lawrence in order to trade as a flock manufacturer (ACC/2558/EL/A/33/020, May 1834). Flock was a low grade wool (or cotton wool) used to stuff upholstery and bedding (or for its better-known use as a textured wallpaper), typically manufactured from fabrics shredded by water or steam-driven mills (Cox & Dannehl, 2007; English Heritage, nd).

Towards the end of 1829 the proprietors (Wilson, Priest and Basnett) leased the calico grounds, the dye houses, printing house, colour and copperplate house, carthouse and other buildings formerly occupied by Mullinger, together with 'those six messuages situate being outside of the entrance to the aforesaid Grounds together' (i.e. the six cottages) to a partnership comprised of Thomas R. Dixon and George Nicholson for the term of 19 years, at an annual rent of £50 (ibid). Dixon and Nicholson aimed to resume flock production at the site and leased the entire freehold portion of the estate, including the Temple Mills and premises, Cutlers Mead, the calico ground and colour and dye houses, the six cottages and the copyhold Osier Hope and access road on the east bank of the Tumbling Bay Stream (LMA ACC/2558/EL/A/33/020, May 1834).

This business ceased trading in spring 1834 they and the lease was transferred to the East London Waterworks Company (Pigot & Co, 1832-4: 711; LMA ACC/2558/EL/A/33/020, May 1834).

2.5.3 The East London Waterworks Company at Temple Mills 1834-c 1854

The earliest efforts to abstract water from the Lea and the Back Rivers in order to provide a regular public water supply to the Stratford area took place in the mid-18th

century, when the West Ham Water Company began to draw water from the Shire Stream (later known as the Waterworks River) at Saynes Mill (Powell, 1973: 57).

Neither the West Ham nor the nearby Shadwell Waterworks Companies was a commercial success and both were subsequently absorbed by the East London Waterworks Company (ELWW Co) in 1807 (Select Committee, 1821: 61). Forbidden from drawing water from the Thames at Shadwell, the new Company was ordered to take all of its water from the Lea, necessitating the construction of a new intake and reservoirs at Old Ford to supplement and ultimately replace the existing works at Saynes Mill (Select Committee, 1821: *ibid*).

In 1829 the Company obtained powers to open an intake higher up the Lea, and the following year purchased the former Hackney Waterworks Company's works at Lea Bridge Mills (Baker, 1995: 108).

In 1834 the Company announced that the Old Ford intake was to close, and that water would no longer be drawn from the river below the tail of the Lea Bridge Mill (Report of the Select Committee, 1834: 121). Among the properties earmarked for purchase were the flock mills and works at Temple Mills, as discussed above.

In the years that followed the Waterworks Company's acquisition of the Lea Bridge and Temple Mills, the Trustees of the River Lee received a number of complaints regarding the condition of the Tumbling Bays at these locations (e.g. TNA RAIL 845/11: 282, 309). It also appears that certain wharves on the Temple Mills Stream fell into disrepair at this time, and instructions were given to James Griggs, the Trust's Surveyor to rebuild them in 1851 (TNA RAIL 845/14: 21).

The original mills were then pulled down in 1854 and, by the time of Stanford's map of 1862, a number of separate small buildings had replaced them.

2.5.4 The development of the Board's lands at Temple Mills c 1870-c 1910

During the early 1860s the Trustees of the River Lee (The Lee Conservancy Board: LCB) began to actively court business tenants to lease premises on Trust property in Hackney Marsh.

At the beginning of April 1894 the Engineer of the LCB received an application from a Mr Clay of Stratford to purchase the two pieces of land then let to a Mr Kingsley (TNA RAIL 845/27: 299). Clay was the proprietor of Messrs Clay and Son, who manufactured artificial manure at their works on Wycliffe Road. The company had been trading in the locality since the early 1860s and had acquired the island of land between the Waterworks River, Potters Ditch, and the Channelsea by 1888, when it was given permission by the Board to build an access bridge across the Channelsea from its works on the east bank (TNA RAIL 845/24: 489). Despite the fact that Clay and Son was an established business, the Board elected to decline Clay's application and Kingsley continued to lease the land (ibid: 311).

It is almost certain that the Kingsley to which the land was let was Henry Kingsley, a local coffee house keeper who lived at Temple Mill/ White Hart Cottages: the cottages on the site.

Kingsley was first listed as a local resident by the 1861 census, which recorded that he lived at no. 2 Temple Mill Cottages with his wife Mary, their three children and their son-in-law (West Ham Enumeration District No. 12, 1861 Census). Kingsley

remained at no.2 until at least 1881. Around 1900 Kingsley appears to have retired, moving with Pickett to the newly-built no. 2 Wycliffe Road in time for the 1901 census (Stratford Enumeration District No. 24, 1901).

Kingsley seems to have been a relatively successful trader. His coffee house was listed in trade directories of 1888, 1890 and 1900, though the address was simply given as 'Coffee House, Temple Mills Temple Mills Lane' (Post Office Directory of Forest Gate, Leyton, Leytonstone, Plaistow &c, 1888-9; Post Office Directory of Essex, 1890: 346; Post Office London Directory, 1900: 413). Between 1871 and 1881 Kingsley established a sideline as a self-employed 'carbonic paper maker' (described as a 'stationer' in the 1891 census), a business that he may have also conducted from one of the non-domestic premises on the site.

Though the details of Kingsley's lease are presently unknown, is conceivable that the Board offered him terms comparable to those offered to Beresford in 1877 and constructed wharfing and the roadway on the west bank of the Tumbling Bay Stream during this period.

Census returns from 1881 and 1891 suggest that White Hart Cottages attracted a number of other self-employed traders. At some point in the decade after 1871 Clair Phillips, a widowed 30 year old waste paper dealer moved into no. 4 with a young married couple named John and Rossetta Bateman, who also worked as waste paper dealers. John Bateman and his second wife Caroline were listed as occupants in 1891 and again in 1901, when John was described as working on his 'own account' (i.e. self-employed). John Bateman was also listed as a waste paper dealer in a trade directory of the same year (Post Office London Directory, 1900: 413).

In 1881 no. 5 was occupied by Edwin Gillingham a 29 year old self-employed sausage skin dealer who shared the property with his wife Mary and their three children. As their family continued to grow during the decade that followed, the Gillinghams moved into nos. 1 and 2 White Hart Cottages, which were depicted as a single property on the Second Edition Ordnance Survey map of 1894. Edwin was listed as a sausage skin manufacturer at nos. 1 and 2 in a trade directory of 1900, and the couple and their two youngest daughters were still resident in 1901 (Stratford Enumeration District No. 24, 1901; Post Office London Directory, 1900-1: 413). Though Edwin continued to trade as a sausage skin manufacturer, a trade directory of 1908 gave his address as no. 53 Temple Mills Lane (a residential address occupied by one David Croucher and family in 1901), suggesting that he too had left White Hart Cottages by this date. It is possible that Bateman and/or Gillingham may have used some of the detached structures depicted by the First and Second Edition Ordnance Survey maps as business premises.

Though Clay and Sons' application to lease the two pieces land owned by the Board at Temple Mills had been rejected in 1894, two years later Messrs G. W. Abbott and Sons (waste contractors of Hackney) submitted a request to purchase the same sites (TNA RAIL 845/28: 418). The Board agreed to sell the land to Abbott, provided that the latter accept the Board's Parliamentary title under the 1850 Act (ibid: 422). The Board agreed to Abbott's subsequent request that the roadway 'between the two pieces and leading to the other land belonging to them' be included in the conveyance (ibid: 458-459). This appears to be the earliest unambiguous reference to the north-south road at the present site.

Abbott and Sons arrival signified a major change of use at the site. Though White Hart Cottages remained in occupation, the self-employed residents of the 1880s and 1890s had all either left or retired by the end of the first decade of the 20th century, by which date Abbott and Sons established a dust shoot where street sweepings and other waste from Hackney were dumped.

By 1915, when the Revised Edition Ordnance Survey map of the area was surveyed, the eastern boundary of Abbott's estate (the east bank of the Waterworks) had been straightened and strengthened, and the uppermost stretch of the Channelsea infilled. The cottages and the roadway were both retained; the latter presumably used by Abbott's vehicles to access the company's dust shoot at the southern end of the site. While the vicinity had long been home to a number of noxious trades (not least Clay's Artificial Manure Works), the arrival of Abbott and Sons was followed by the establishment of a commercial piggery near Temple Mills Lane by Messrs Barber and Co. by 1913 (TNA RAIL 845/40: 179).

In May of that year the body of a drowned child was discovered in the former Tumbling Bay Stream (then described as a tidal backwater of the Channelsea) only 10 feet away from the roadway. The body had been in the water for a number of days before it was eventually found, having been 'completely hidden' beneath 'filth from the piggeries' and debris blown from Abbott's dust shoot (TNA RAIL 845/40: 121).

2.5.5 The closure of the waterways, the demolition of White Hart Cottages and the dumping of refuse c 1920-1937

The site still belonged to Abbott's estate in the late 1920s, when it was proposed to infill the surviving stretch of the old Tumbling Bay Stream (LMA ACC/2423/P/2069, May 1927, Figure G).

Though the stream remained open for a further decade, the end of the 1920s saw the beginning of 'controlled tipping' in West Ham, whereby the Corporation designated certain low-lying sites in the Borough as waste tips (Various, 1936: 173). Refuse dumping began at Temple Mills in 1929, though the present site remained open until the 1930s.

Towards the end of the 1920s it was finally decided to resolve the perennial problem of flooding and pollution in the Lower Lea Valley. In 1929 the Board's Engineer, C.N. Tween, the Consulting Engineer J. Mackworth Wood and W. Lionel Griffiths, Borough Engineer of the West Ham Corporation revived a flood relief scheme originally devised in 1921 by Tween and Hill in association with the abortive River Lee Watershed (Flood Prevention) Bill of 1920. Tween, Wood and Griffiths issued proposals for a scheme that would provide flood drainage for the entire Lea Valley, reducing the incidence of flooding caused by upland water entering the Back Rivers, and which would allow selected Back Rivers to be navigable irrespective of tide (LMA ACC/2423/AL/104, 12th November 1929). In 1930 the Board sought Parliamentary powers to implement the scheme, which received assent that November as the River Lee (Flood Relief) Act.

Though the majority of the works carried out in association with the scheme took place to the south of Temple Mills, the Act obliged the Joint Committee of the Board and the Corporation responsible for its implementation to dredge the Lee between Carpenters Road and Lea Bridge The contract for the dredging was awarded to W &

C French and work commenced in August 1934. (Minutes of the Joint Committee, No. 45, 16th May 1934: 9-10). Because the river between these two points was flanked by high steep banks of tipped material it was necessary to form shelves on the banks to allow dredging to proceed. By September dredging was underway at Abbott's Shoot, while work had begun on the formation of a shelf at Bully Fen by the middle of October (Minutes of the Joint Committee, No. 49, 19th September 1934; No. 50, 17th October 1934).

While most of the material dredged from the Lee was dumped at Mill Meads and at an LNER shoot situated on low-lying land on the east bank between Carpenters Road and Temple Mills Road, it was also decided to dump it in 'the small disused waterway near Temple Mills sidings' (ibid; LMA ACC/2423/P/2463/2-5, February 1934). It is possible that the 'disused waterway' was the surviving stretch of the Tumbling Bay Stream, which had originally been earmarked for closure seven years earlier.

By November dredged material was being dumped at the LNER shoot and in the disused waterway (ie The Tumbling Bay Stream), while dredging was completed the following February (Minutes of the Joint Committee, No. 51, 21st November 1934: 9).

By the 1930s White Hart Cottages were owned by the (Eton) Manor Charitable Trust (TNA HLG 23/13361). Isolated in the midst of Flood Relief works, private and council tips the West Ham Corporation issued an order for their demolition in June 1936, declaring the site a 'clearance area' under Section 1 of the Housing Act 1930. Instructions were given to vacate the properties within twelve months of the order, though it is clear from the accompanying schedule that the cottages were already empty.

At the end of this activity, the Tumbling Bay Stream had been infilled, the buildings pulled down and the site had become submerged under dumped refuse.

3 Original research aims

The following research aims and objectives for the excavation were established in the *Written Scheme of Investigation for Archaeological Evaluation* (MoLAS-PCA 2008) and are intended to address the research priorities established in the Museum of London's *A research framework for London Archaeology* (2002):

- Can surviving remains of the medieval and post-medieval mills at Temple Mill provide information on the nature of the industrial activity in the Lea valley?
- What was the pre-modern/pre-Victorian topography of the zone?
- How extensive is modern truncation across the zone? Do made ground deposits bury or truncate the post medieval/modern land surface?
- Is there evidence for past water management, i.e. drainage ditches, mill remains, sluices and revetments associated with earlier courses of the Channelsea River/Henniker's Ditch and River Lea?

4 Site sequence: interim statement on field work

4.1 Period 1: natural drift geology (late Pleistocene/early Holocene)

Period 1 represented the natural drift geology across the site. These deposits were encountered only in Trench 1 and Trench 3.

Islands of slightly higher and dryer land within the floodplain are likely to have been the focus for human settlement from an early period. Indeed, sands early in the sequence in Trench 3 were dated to the upper Palaeolithic, while the upper parts of the sequence in this trench were dated to the later Neolithic. Some fragments of animal bone were found in the sand layer: sand [211] in Trench 1 included a dog bone, and two sheep bones were recovered in Trench 3 from sand [842]. The bones were stained dark brown, probably indicating that they were water lain. However, as the natural sands were overlain by alluvial deposits these animal bones may have been lain by activity associated with Period 2.

4.1.1 Trench 1

In a machine excavated sondage that measured 2.0m east-west by 0.60m north-south in the base of Trench 1, a fine light grey sand [211] with occasional small angular flint pebbles, fragments of mollusc shell and wood was encountered between 1.72m OD and 1.62m OD.

4.1.2 Trench 3

A yellow brown gravel [940] was encountered at 1.18m OD in a machine-dug sondage at the west end of Trench 3. Rapid ground water inundation meant that for health and safety reasons the sondage had to be speedily backfilled. The gravels of [940] are considered to be late Pleistocene or early Holocene deposits of a high energy, post glacial fluvial environment forming braided channels across the floodplain. In this area at the extreme western part of the site it is likely that the gravels fringed the floodplain of the stream just to the west of the site.

The gravel was overlain by a light brown silty sand [939] 0.34m thick. The highest level on the sand was at 1.52m OD.

At the west end of Trench 3, overlying the sand [939] was a layer of light to mid grey coarse sand [842] with frequent small rounded flint pebbles that measured at least 5.0m east-west by 2.80m north-south. The layer was encountered between 1.76m OD and 1.70m OD. The sand was sampled for environmental analysis (bulk sample <27> and monolith <30>). This deposit was also recorded in the north-facing section 36 (see Fig 14).

To the north and east of [842] and separated from it by [837], a layer of peaty clay recorded in a depression, was a yellow silty sand [830]. The layer which measured 8.0m east-west by 3.80m north-south sloped to the west falling from 2.24m OD to 1.62m OD. (Contexts [842] and [837] are shown on Fig 3). The yellow silty sand [830] was dated by radiocarbon analysis to the upper Palaeolithic at 13,130-12,880

BP (11,180-10,930 BC) (see Table 30), the earliest date returned for the site. Both the macro and microfossil assessments returned little information on this context other than to confirm, through pollen assessment, that during the time of deposition the local environment was probably an open one dominated by grasses.

In the investigation of the expanded Trench 3, overlying the natural sands [939], [842] and [830] was a dark grey brown peaty clay layer [837] that measured 7.15m east-west and 0.35m thick (dimensions taken from section). The peat horizon lay between 2.20m OD and 1.99m OD. This deposit was recorded in plan and in the north facing section 36 (see Fig 14). The layer was sampled to retrieve environmental information (bulk sample <24> and <29>, monolith <30> and C14 <31> and <32>). The sands and clays of contexts [939] and [837] (the latter dated top and bottom) are much later in date than [940] but still of the same period (between 2470 and 2210BC) in the later Neolithic. This indicates a significant period of flooding during an isolated period in prehistory, possibly ponding back of the Lea.

Plant macrofossil and pollen assessments of [837] and [842] indicated an environment fairly rich in trees with Alder at the river's edge and Oak dominated woodland on the higher ground. Anthropogenic disturbance was seen in the plant and insect assessment with disturbed or waste ground plant species and beetles associated with dung in evidence (and two sheep bones thought waterlain were recovered from [842] during fieldwork). The wider ostracod assessment found this river marginal area to be shallow with clear, clean freshwater although, in contrast and possibly reflecting the environment of the floodplain after floods occur, the insect assessment found evidence of stagnation in shallow pools with floating rafts of vegetation (as well as evidence of clear running freshwater).

At the east end of Trench 3 a layer of clayey sand [959] was exposed that measured 3.30m east-west by 2.10m north-south. The level on top of the sand was between 2.19m OD and 1.74m OD (not illustrated).

4.2 Period 2: alluvial deposition with channels (late Bronze Age/early Iron Age– medieval)

Period 2 represents alluvial deposition associated with a marshy environment and a changing river regime. Within this, were organic peaty layers and silted-up water channels (mostly recorded in section). The site was marshy for a long period: between 1700 and 2000 years.

Dating analysis showed that the alluvial sequence which covered the site (*c* 1.50m thick) had built up over a long period with distinct dated episodes of deposition. In Trench 3, deposits at the base of the sequence were dated by radiocarbon analysis to the late Bronze Age or early Iron Age (800–720 BC or 700–540 BC). There was then a considerable hiatus between this and the next stages of deposition, which were dated to the late Iron Age/early Roman period (160BC to AD60) and mid/late Roman period (AD 240–420). The next phase of alluvial deposition was dated to the early/mid Saxon period (AD590-670, AD640-770 and AD670 to 890). The final phase was dated to the medieval period (AD1030 to 1220).

The inclusions of fragments of ceramic building material, mortar, chalk and charcoal within the upper *c* 0.50m of the alluvium suggest that the process of deposition was continuing until the medieval period, complemented by the dating above. Within the

alluvium in Trench 3 a few sherds of Essex ware medieval pottery dating to the 12th century were found. These ceramics could have derived from the medieval mill or a nearby settlement. Medieval moulded stone was found in later contexts, and included parts of column bases of Reigate stone and Taynton stone. It is speculated that the stone derived from the abbey at St Mary Stratford Langthorne, but other ecclesiastical sites in the London region are also possible sources.

The silted up channels are likely to represent small tributaries to the River Lea known as the Stratford Back rivers. The plant macrofossils for this period indicated wetland areas and disturbed or waste ground with anthropogenic/agricultural activity across the floodplain. Molluscs indicated a freshwater environment. The insect assessment also found aquatics and damp-ground taxa, as well as taxa usually associated with dung, again denoting agricultural activity in the vicinity.

No evidence for the medieval Knights Templars' watermill discovered in the excavation area. The medieval mill estate included several acres of meadow land and one acre of osier ground (reed beds): the excavation area was probably part of this larger estate.

4.2.1 Trench 1

Overlying the sand [211] assigned to Period 1 was a layer of soft grey brown clay [171] with frequent inclusions of snail shell and fragments of wood. In plan the layer measured 3.0m x 3.0m and the top of the deposit was encountered between 2.67m OD and 2.35m OD.

Layer [171] was truncated in the north-east corner of Trench 1 by cut [190] partially recorded in plan (see Fig 3) and in the south-facing section 15 (see Fig 12). This feature was not bottomed but it was at least 0.15m deep and the highest level was at 2.48m OD. The cut in plan was at least 1.30m long and 1.72m wide. The sides of the cut [190] were steeply sloping. A dark grey brown clay [189] filled the feature. The highest level on the clay [189] was at 2.59m OD.

Recorded in the north-facing section 13 (not illustrated) was a cut [170] truncating the clay layer [171]. The cut, which was at least 1.08m wide and 0.24m deep, was characterised by steeply sloping sides falling to a flat base. The highest level was at 2.59m OD and the lowest was at 2.35m OD. A grey brown clay [169] filled cut [170].

It may be that the two contexts [190] and [170] represent a single feature possibly a water channel aligned north-south on the eastern side of Trench 1.

A sequence of clay deposits [178], [176], [188] [177] and [195] was recorded in section up to *c* 0.60m thick that covered the cut features [170]/[190]. The highest level on these clay deposits was on layer [188] at 3.18m OD.

Truncating clay [195] was a cut feature [194] recorded in north facing section 13 (not illustrated). It measured 2.70m east-west and was 0.32m deep and was characterised by sloping sides falling to a flat base. The highest level was at 2.86m OD. Filling it was a sandy clay [168] covered by an upper fill of clay [167]. Both clay deposits had inclusions of ceramic building material (ceramic building material), mortar and charcoal/coal and the remains of a timber plank was noted lying between the interface of [168] and [167]. The feature described is thought to be part of the natural alluvial depositional sequence.

Covering feature [194] was a layer of clay [166] with inclusions of occasional snail shell, flint pebbles, and fragments of ceramic building material *c* 0.50m thick. The highest level on this deposit was at 3.40m OD.

4.2.2 Trench 2

In Trench 2 the top of the alluvial deposition was encountered at between 3.59m OD and 3.62m OD across the excavation in an area that measured 5.0m east-west by 3.50m north-south. No further excavation was undertaken in this trench.

4.2.3 Trench 3

At the east end of Trench 3 the clayey sand [959] assigned to Period 1 was covered by yellowish brown clay [307] that measured 6.0m north-south by 4.50m east-west. The clay [307] was streaked with 1.0m wide bands of bluish grey clay [308] and [309]. These clay deposits were encountered between 2.56m OD and 2.44m OD.

A peaty clay [835] measuring 1.20m east-west was recorded further to the east, at the east end of section 36. The highest level on [835] was at 2.19m OD and the lowest was at 2.04m OD.

A layer of silty clay, [281], was dated by radiocarbon analysis to 2110-1890 BP (160BC to AD60) (see Table 30). In plan the deposit measured 13.0m east-west, 5m north-south, was up to 0.30m thick and continued beyond the trench limits to the north, south and west. The highest level on this deposit was at 3.80m OD.

In section 36 overlying the peat deposits was a sequence of alluvial clays [838], [822] and [834] up to 0.50m thick, between 2.68m OD and 2.43m OD. Context [838], a dark brown, organic silty clay, was dated by radiocarbon analysis to the early/mid Saxon period (AD640-770) (see Table 30). Context [822] was dated by radiocarbon analysis to the medieval period (AD1030 to 1220) (see Table 30).
Clay layer [822] was truncated by a possible water channel [844] also only recorded in section 36 (see Fig 10, Fig 13). The channel was at least 2.18m wide and 0.38m deep characterised by sloping sides falling to a slightly concave base. The fill was a bluish grey silty clay [841] with occasional fragments of wood and shell.

Truncating the bed of the channel and clay layer [838] (a dark brown, organic silty clay, was dated by radiocarbon analysis to the early/mid Saxon period (AD640-770)) were three possible stake holes [868], [870] and [872] of uniform size up to 0.10m in diameter and *c* 0.15m in length and filled with similar gravely coarse sand (see Fig 13). These features could represent a man made structure within the channel.

Truncating channel [844] was another water channel [843] 4.67m wide and 0.55m deep recorded in section 36 (see Fig 13). This was filled with a sequence of sands and silty clays [836], [840], [833]/[839], [861], [860] and [832]. The fills were environmentally sampled (monolith sample <26> and bulk sample <37>, <38> and <39>). The highest level was at 2.59m OD. [836], a poorly sorted, steeply (eastward) sloping lens of poorly sorted sands, gravels and occasional chalk fragments also included the bones of foals, indicating horse breeding in the locality. Context [833/839] was dated by radiocarbon analysis to the early/mid Saxon period (AD590-670) (see Table 30). There is a dating inconsistency here as the sediments of the higher context [833/839] date slightly earlier than [838] (above), although the date ranges overlap. It is likely that these sediments do come from and represent the

conditions of the early Saxon period but it is not entirely clear as to whether they are *in situ* or not having possibly been dug up, presumably very locally, and used to line the base or bank of the newly formed stream.

The organic sediments of [833/839] and [838] (filling channel [843]) returned good results in nearly all micro and macrofossil assessments. The plant and pollen work indicated anthropogenic activity with disturbed ground taxa and cereal production evident. Furthermore, although the local environment was dominated by grasses, there was evidence of Ash, Elm and Oak on the higher ground but also, importantly, wild apple and pear which would have supplemented the diet locally. Insect species further indicated the grazing/waste of animals in the area, another agricultural indicator, but also clean, flowing, shallow open water.

Channel [843] was covered by a sequence of alluvial clays [806], [803] [802] up to 1.10m thick recorded in section 34 (not illustrated). Pottery from layer [806] is dated AD 1550–1700. The highest level was at 3.68m OD on the clay [802].

At the west end of Trench 3 a sequence of clay deposits *c* 1.10m thick was recorded (contexts [355] [272], [269], [282], [270] and [271]) in section (not illustrated) between 2.44m OD and 3.50m OD. Medieval pottery dated to AD 1000–1225 was recovered from context [269] a clay deposit encountered at 2.67m OD. Medieval pottery dating to AD 1000–1225 was also recovered from the clay [270]. The highest level on layer [270] was at 3.13m OD. Context [270] was dated by radiocarbon analysis to 1280-1060 BP (AD670 to 890) (see Table 30), suggesting the pottery in this context was residual..

A further channel cut, [904], was present in north facing section 40 truncating alluvial deposit [806] (see Fig 13). This feature was interpreted as the western bank of a north/south orientated stream. The sides of the cut were slightly concave with a gentle break of slope towards the base. The stream was at least 2.95m wide and 0.65m deep. The highest level was at 3.44m OD and the lowest was at 2.79m OD. The channel was infilled with a sequence of silty clays and silty gravel [903], [902], [901] and [900].

Also in section 40, cutting the upper fill [900] of channel [904] was another cut [907] which may represent a re-cutting of the stream and a migration of the water channel further to the east (see Fig 13). The sides of [907] were characterised by a gentle slope at the top and then a steep break of slope. The channel [907] was at least 1.93m wide and 0.76m deep. The highest level was at 3.57m OD and the lowest at 2.84m OD. A sequence of sandy clay [906] and clay [905] filled the channel.

A further migration of the water channel recorded in section 40 appears to have taken place represented by another cut [899] that truncated the upper fill [905] of channel [907] (see Fig 13). The sides of the cut [899] were sloping and slightly concave with a steeper break of slope towards the base. The channel was at least 0.67m wide and 0.49m deep. The highest level was at 3.59m OD and the lowest was at 3.29m OD. A clayey silt [898] filled it.

A similar depositional sequence to that recorded in the north facing sections 36 and 40 was also recorded in the south facing sections 37, 38 and 39 (see Fig 14).

Recorded in south facing section 38 overlying the sandy clay [830] (see Period 1) was a layer of dark grey organic material [827] similar to [837] (see Fig 13). The layer

sloped to the west from 2.32 m OD falling to 2.02m OD. The deposit was sampled for environmental analysis (bulk sample <35> and monolith <28>). This analysis showed that organic silty clay [827] was lain during a slow alluviation process, probably with seasonal flooding. The radiocarbon dates indicate there is a considerable hiatus in time between the deposition of [830] and [827] as [827] was dated by radiocarbon analysis to the late Bronze Age or early Iron Age (800–720 BC or 700–540 BC). Context [827] was rich in macro and microfossils, including aquatic seeds and species reflecting disturbed and waste ground indicative of anthropogenic/agricultural activity. This is reflected in the pollen data which found both cereal and hemp growing nearby or being processed on the site. Grass was the dominant plant across the floodplain with the river margins thick with sedge and reed with Oak dominating the woodland on the higher ground. Both the diatom and ostracod assessment indicated the river to be freshwater, clear, clean but shallow probably reflecting the nature of the flood deposit lingering on the floodplain.

Partially overlying [827] and located in section 38 was a layer of clayey sand [828] 0.13m thick (see Fig 13). The highest level on the sand was at 2.14m OD.

The sand [828] was in turn covered by a sequence of alluvial clays 0.50m thick contexts [862], [831], [854] and [855] (see Fig 13). The highest level on the clay was at 2.60m OD.

A probable natural water channel (cut [846]) truncated the clay layer [831] (see Fig 13). This was characterised by steeply-sloping concave sides falling to a gradual break of slope and a flat base. This channel was at least 3.30m wide and 0.45m deep. The highest level was at 2.54m OD. The primary fill of the channel was a reddish brown sandy gravel which was overlain by a sandy clay [845]. The sandy clay was sampled for environmental analysis (bulk sample <36> and monolith <28>). Fill [845] was dated by radiocarbon analysis to the mid to late Roman period (AD 240–420) (see Table 29). Although the plant macrofossils were found to be similar to [827] (above) there was the noticeable increase in cultivated wild fruits for example, as well as exotic Roman imports such as grapes (*Vitis vinifera*). Generally, however, the floodplain environment was found to be becoming increasingly wetter with an increase in marsh species noted in the pollen. Diatoms reflected shallow freshwater and ostracods indicating clear clean conditions in the area at this time.

Channel [846] was sealed by a dark blue grey layer of alluvial clay [853] up to 0.30m thick. The highest level on the clay was at 2.80m OD. Pot sherds dated to AD1000–1225 as well as fragments of probably medieval peg tile were recovered from this deposit.

Overlying clay layer [853] was a sequence of reddish brown clays [914], [913], [912] and [915] up to 0.90m thick recorded in section 39 (see Fig 13). The highest level of this clay sequence was at 3.71m OD. Inclusions within the clays comprised flecks and fragments of chalk and occasional flecks and fragments of ceramic building material.

Also recorded in section 39 truncating the clay sequence described above (in para 7.2.27) was a possible drainage ditch [911] (see Fig 13). However no similar feature was found in the south-facing sections of Trench 3 and it may be that the feature is an intrusive pit dug later in the archaeological sequence. The cut was 1.40m wide at the top and narrowed to metre at the bottom, was 0.80m deep and was characterised by steeply sloping sides falling to a flat base. The highest level on the cut was at 3.77m

OD. The primary fill of the ditch was a light grey clay [910] 0.30m thick with frequent inclusions of shell and occasional fragments of brick and tile. The basal clay [910] was overlain by a secondary fill of sandy gravel [908] measuring 0.25m thick. A final fill sandy silt [909] 0.25m thick covered [908]. Pottery found in [910] is dated to AD 1200–1550.

Recorded in sections 37 and 39 truncating the alluvial clay [915] was the cut of a possible water channel [852] (see Fig 13). The channel was 3.45m wide and 1.10m deep. The sides of the channel sloped to a slightly concave base. The highest level on the cut was at 3.61m OD.

The primary fill of the channel [852] was recorded in section 37 as a sandy silty clay [851] with frequent flecks and small fragments of ceramic building material and mortar, 0.10m – 0.15m thick. Fill [851] was overlain by a secondary fill of sandy clayey silt [850] with lenses of fine sand 0.40m thick. In section 39 channel [852] was filled with an orange brown clay [922] with occasional flecks and fragments of chalk, ceramic building material, and charcoal. The highest level on this deposit was at 3.41m OD. Fill [922] was covered by a dumped deposit of firmly compacted clay [916] which was up to 0.50m thick. Within the clay matrix of [916] were loose lenses of gravel and fragments of ceramic building material with occasional flecks of chalk and charcoal.

4.2.4 Trench 4

In the base of Trench 4 to the south and east of what may have been a natural water channel [1011] (Fig 3) was a layer of soft peat with lenses of fine yellow sand [1008] (see Fig 12). Within the trench the layer [1008] covered an area that measured 7.60m east-west by 6.40m north-south. In plan the deposit was recorded at between 2.10m OD and 1.92m OD but the highest level in section 45 was at 2.20m OD. The deposit was bulk sampled <53> from the north facing section 45 (see Fig 13).

To the north of the channel [1011] was a light blue grey alluvial clay [1061] encountered at between 2.20m and 2.18m OD (see Fig 12). In plan the deposit measured 2.0m east-west by 1.0m north-south.

In the south-facing section 50 clay deposit [1061] was overlain by a layer of peaty clay [1013] recorded between 2.43m OD and 2.33m OD (see Fig 12). The peaty clay was also seen in plan where it covered an area by 1.80m north-south by 1.50m east-west.

At the east end of section 50 overlying the peat layer [1008] was a peaty clay [1062] (see Fig 12). This deposit measured 2.0m east-west and was 0.32m thick. The highest level was at 2.48m OD.

Present only in section 50 peaty deposit [1062] was overlain by brownish grey clay [1059] 0.18m thick (see Fig 12). The highest level was at 2.66m OD. Overlying layer [1059] was what may have been the clay bank [1058] to channel [1011] (Fig 3). This bank was 1.10m wide and 0.37m high. The highest level on [1058] was at 2.85m OD

At the west end of section 50 the peat deposit [1013] was overlain by a layer of clay [1012] that was 0.18m thick, and which measured 2.10m east-west (maximum) and was at between 2.60m and 2.33m OD.

A natural water channel (cut [1011]) in the base of Trench 4 (aligned NE-SW) truncating clay layers [1058] and [1012] (see Fig 3, Fig 12). This channel was *c* 2.20m wide and 7.0m long in plan and it continued beyond the area of excavation to the north and the south-west. The channel was at least 0.55m deep but the feature was not bottomed. The cut was characterised by steeply sloping sides. The highest level was at 2.73m OD and the lowest at 2.18m OD. Its lowest fill was a dark bluish brown clay [1010] with frequent shell and occasional fragments of wood. The highest level was at 2.46m OD.

Overlying clay fill [1010] of cut [1011] was an upper fill of grey clay with occasional shell and flecks of chalk [1057] *c* 0.40m thick (see Fig 12). The highest level was at 2.73m OD.

Recorded across the whole length of section 50 (6.50m east-west) and covering the channel [1011] was a sequence of alluvial clays [1005] overlain by [1004] which was *c* 0.40m thick (see Fig 12). In the east facing section 49 (not illustrated) it was noted that overlying [1004] was a brown grey clay [1060] which was up to 0.50m thick. The highest level on [1060] was at 3.50m OD. Inclusions within these clays included shell, fragments of ceramic building material, chalk and mortar.

A similar sequence of deposits was also recorded in the north-facing section 45 (see Fig 12).

In section 45 the peat layer [1008], was overlain by a layer of peaty clay [1007] encountered between 2.57m and 2.41m OD. This is probably the same deposit as context [1062] recorded in section 50.

Overlying peaty layer [1007] and recorded in section 45 was a layer of light brown clay [1006] which was *c* 0.18m thick and encountered between 2.75m and 2.59m OD (see Fig 12). The layer [1006] was probably the same deposit as [1059] and recorded in section 50.

Clay [1006] was overlain by the orange brown clay [1005] also recorded in section 50. In section 45 the clay [1005] which was 0.22m thick and the highest level was at 2.91m OD.

A possible ditch or small water channel [1093] was present in section 45, truncating deposit [1007] (see Fig 12) It measured 1m wide and 0.18m deep. The sides of the channel were sloping and slightly concave falling to a flat base. The highest level was at *c* 2.47m OD and the lowest at 2.30m OD. It fill [1028] was a silty clay with occasional chalk flecks.

In the south of Trench 4 deposits that may be part of the alluvial sequence were recorded in section 47 (not illustrated), a silty clay [1042] with frequent fragments of mortar, at 3m OD and layer [1045] at 3.65m OD.

4.3 Period 3: use of the marsh, reclamation and industrial development (late 16th/early 17th century–late 17th/early 18th century)

Period 3 represents the earliest structural/cultural activity recorded in the marsh, its draining and the creation of a dryland environment suitable for industrial development.

Unearthed in Trenches 3 and 4 was a double row of 25 timber piles that could have supported a walkway. The timber structure, dated on technological grounds to the late 16th to early 17th century, would have provided a way to cross the marshy, wet-land that appeared to prevail across the site during the early post-medieval period.

The subsequent reclamation of the marshland probably continued a process that had been ongoing in a piecemeal fashion since the medieval period, and the successive channels recorded in Period 2 may have been part of this process. However, by the late 17th century, on the east side of the excavations, in Trench 3, the west bank of a channel (known as the Tumbling Bay Stream) was reveted with timber.

Evidence was also uncovered in Trench 4 for a revetment to a channel to the west and beyond the limits of the site, with the uncovering of a tie-back fixed to a timber anchor. The channel to the west of the site was the Temple Mills Stream (later known as the Waterworks River).

The Tumbling Bay Stream probably originated as a weir channel through which water from the Temple Mills Stream bypassed the east side of the Temple Mills complex and drained into the Channelsea River.

Ground level across the site in Period 3 was around 4.10m OD. The top of the eastern bank of the Tumbling Bay Stream, which was planted with trees (see 5.11.3.5 Tree stumps along the east edge of the Tumbling Bay Stream), was noticeably lower at 3.67m OD. This was probably quite deliberate use of the terrain for flood management as the lower lying, open land to the east of the site could be inundated with overflow water during times of flood while the developed land would have remained above any flood waters.

The remains of earliest masonry structure (Building 1) on the site were unearthed in Trench 4. Building 1 measured 5.0m by at least 3.0m and was defined by the remains of two parallel wall foundations. Building 1 seems to have been quickly superseded by another brick built structure (Building 2), which may have been a foundry. The bricks used in both buildings are similar and are consistent with a construction date of the late 17th or early 18th century.

The use of Building 2 as a foundry was suggested by a sunken brick lined feature probably a furnace and the quantity of copper alloy slag found in the backfill to the furnace and in the floor makeup layers to the building. Other finds were also recovered that may relate to the industrial use of Building 2 including numerous iron nails, an iron collar sf <63>, an iron staple sf <70> and pieces of lead waste.

The timber-lined pit internal to Building 2 may be associated with the industrial processes that were being undertaken. This may also be the case with the layer of scorched earth and the masonry drain uncovered to the north of Building 2.

A probable millrace, sited to the south of Building 2 would have channelled water from the Tumbling Bay Stream into the watercourse to the west of the site. A mill would have provided the necessary source of power, to work the bellows for a furnace and may have driven other machinery associated with the foundry.

The documentary evidence suggests that one or more of the mills located on the Temple Mills estate was engaged in the manufacture of brass kettles, and tin and latten plates during the 1690–1720 period. It is very probable that the excavation at

Temple Mills has unearthed one of these metal-working mills mentioned in the historical sources.

Other notable finds that may be attributable to Period 3 include a copper-alloy coin sf <45> and a double-sided ivory comb sf <72>. These finds together with the pottery, which was predominantly domestic in nature and mostly kitchen or table ware give an indication of nearby domestic habitation. People would have lived close to their work or even on premises used for manufacture in this early post-medieval but still pre-industrial period.

The plant macrofossils in the contexts for Period 3 ([394] [489] [515] [580] [763] [950] [952] [969] [984]) were not particularly productive often with clinker and charcoal indicative of post medieval industrial activity. Moderately rich plant material was found in [950] and [952] however with wetland areas and disturbed or waste ground species indicating anthropogenic/agricultural activity. Likewise insect remains were largely poor except for context [952] with beetles reflecting clean, clear running water but also woodworm beetles and weevils probably indicative of the conditions of the mill and mill race cut [615] from which it was sampled. Molluscs seen in [763], [950] and [952] in particular continued to indicate freshwater and damp grassland conditions prevailing on the floodplain.

The animal bone assemblage gives some indication of the diet that the inhabitants of Temple Mills would have had, with beef dominating supplemented by lesser quantities of mutton and pork.

The glass assemblage confirms activity and occupation of the site from the mid 17th century onwards with early wine bottles.

4.3.1 Trench 1

In Trench 1 a sequence of silty clay deposits [187], [186], [185] and [160] was recorded in section overlying the alluvial clays of Period 2. The layers [187], [186] and [185] were found in section 15 (see Fig 12) and the upper layer [160] was recorded in south and west facing sections 11 and 12 respectively (not illustrated). These deposits had much higher concentrations of inclusions than the alluvial clays including frequent fragments of charcoal/coal, sub-rounded flint pebbles, lumps of chalk, and pieces of ceramic building material and mortar. It may be that these layers were deliberately dumped to raise ground level and create a platform of dry land suitable for development. The highest level on layer [160] was at 3.90m OD.

A George III halfpenny dated 1806 sf5) assigned to context [160] may be intrusive and represent an indication of when the ground horizon of Period 3 was actually buried and the land surface once again deliberately raised.

4.3.2 Trench 2

Recorded in west-facing section 2 (see Fig 11) of Trench 2 was a sequence of dumped deposits [52], [53] and [54] overlying an alluvial layer of Period 3. The dumped deposits were characterised by high concentrations of crushed and burnt ceramic building material and fragments of mortar and coal. The highest level on the dumped deposits was on context [53] at 4.07m OD.

4.3.3 Trench 3

A sequence of dumped deposits of silty clay and silty sands ([261], [267], [288], [289], [300], [301], [362] and [363]) that formed a ground level between 4.06m OD and 4.15m OD. These were excavated by machine and recorded in section (not illustrated).

Recorded in section 40 (see Fig 14) truncating alluvial deposit [806] (see Period 2) was a cut feature [897] possibly a post pit. The cut, which had been truncated by modern machining, measured 0.39m east-west and 0.34m deep and was characterised by steeply sloping sides falling to a concave base. The fill [896] was a silty clay with orange fabric broken brick and fragments of mortar. The highest level was at 3.36m OD. The brick within the fill indicates that the feature is post-medieval and it has been assigned to Period 3. The feature is further evidence that the land was no longer marsh but had been transformed into a stable surface.

4.3.3.1 Tumbling Bay Stream

At the east end of Trench 3 recorded in sections 37, 38 and 39 (see Fig 13) was the western bank of a water channel represented by cut [377]. This cut [377] was at least 2.0m wide and 1.35m deep and was characterised by steeply sloping sides falling to a near vertical break of slope towards the flat base. The highest level on the cut was at 3.74m OD and the lowest at 2.39m OD.

The western side of the channel appeared to have been reveted with timbers. In section 38 the bottom part of cut [377] was filled with sandy silt [849] 0.41m deep, which was truncated by a driven timber post [752].

This structure is further discussed below: 5.11.3.4 Fencing/reveting along the west edge of the Tumbling Bay Stream.

Post [752] may have been part of a timber structure that formed a revetment. Other timber posts that may also be part of this structure (timber posts [884] – [895]) were recorded in plan. The timbers were arranged in double row set between 0.20 and 0.30m apart (east-west) and aligned north-south set over a distance 1.90m.

Details of the timber posts are given in the Table 1 below.

Context No	X-section	Conversion	Setting	Size (mm)	OD Level m OD
752	Circular		Vertical		2.79m OD
884	Rectangular	Box heart	Vertical	80 x 50mm	2.87m OD
885	Circular	Box heart	Vertical	40 x 30mm	2.87m OD
886	Circular	Box heart	Vertical	40 x 30mm	2.86m OD
887	Rectangular	Box heart	Vertical	65 x 40mm	2.86m OD
888	Square	Box heart	Vertical	70 x 70mm	2.83m OD
889	Square	Box heart	Vertical	40 x 40mm	2.83m OD
890	Rectangular	Box heart	Vertical	60 x 55mm	2.86m OD
891	Rectangular	Box heart	Vertical	100 x 80mm	2.85m OD
892	Circular	Box heart	Vertical	40 x 35mm	2.84m OD
893	Circular	Box heart	Vertical	50 x 35mm	2.85m OD
894	Circular	Box heart	Vertical	50 x 35mm	2.89m OD
895	Square	Box heart	Vertical	50 x 50mm	2.89m OD

Table 1 Period 3, details of timber from Trench 3

The eastern bank of the stream was characterised by a silty clays [92] and [93] and the cut [108]. The highest level on the bank was at 3.67m OD. The bed of the stream was

at 2.18m OD. The river channel if measured from the top of the west bank to the top of the east was *c* 9.0m across but the revetment would have narrowed the channel and at normal times the water level would have been below the top of the bank so that 4.50m wide channel could be conjectured (see Fig 6).

The east bank of the stream was planted at regular intervals (of between 1.50m and 2m apart) with trees [483], [484] and [485]. Their stumps were sampled as <6>, <7> and <8> respectively. It is likely that the trees were deliberately planted in order to stabilise the riverbank.

4.3.4 Trenches 3 and 4: walkway (late 16th/early 17th century)

Unearthed during the machining of Trenches 3 and 4 was a double row of 25 timber piles that could have supported an elevated walkway at least 12.0m long and *c* 0.50m wide.

This structure is further discussed below. See 5.11.3.1 Walkway and Fig 4.

Of particular interest were the reused timbers derived from a barge and shipyard waste. Both timbers are a reminder that the River Lea was a navigable waterway and that yards for boat building and boat breaking were probably located in the locality. Although recovered from a later phased deposit a lead sounding weight sf47) does provide evidence of river traffic.

The timber structure, which has been provisionally dated to the late 16th to early 17th century, could have provided a way to cross the marshy, wet-land that appeared to prevail across the site during the early post-medieval period. Access to the marshy area of the Lea valley would have been important for a range of activities, including grazing, fishing, wild-fowling and cutting reeds. That fish were likely to have been exploited was suggested by the discovery of a possible fish trap. The bones of foals found in the alluvial deposits [831] and [836] of Trench 3 indicate horse breeding in the vicinity.

Recorded on section 45 driven into alluvial deposit [1007] were two vertically set timber posts [1030] and [1031]. These were 0.11m in diameter and timber [1030] was seen to be at least 0.45m long. The level on top of the posts was at 2.57m OD. They may be part of a timber structure formed by a further 23 timber piles and a timber plank which were unearthed during the machine excavation of the alluvium in both Trenches 3 and 4. The piles were aligned north-south over a distance of 12m and for the most part arranged in pairs set about 0.30m–0.50m apart (east-west) and each pair separated between 0.80m and 1.0m apart (north-south). The exception being the four most northern elements, which were more tightly grouped. The dimensions of the timber piles and the OD height on the top of the pile are tabulated below.

Timbers within the alluvial sequence are detailed in Table 2 below.

Context No	Length(m)	Width x breadth(m)	OD Level (m OD)	Conversion
662	1.08	0.12	3.24	Whole
663	0.88	0.13	3.16	Whole
664	0.57	0.16 x 0.14	2.83	Decayed
665	0.68	0.18 x 10	2.51	¼ cleft
666	0.95	0.12 x 0.10		Box heart
667	0.78	0.16 x 0.10		Box heart
715	0.98	0.11 x 0.11	2.27	Box heart
717	0.55	0.09 x 0.07	2.91	Nearly whole
718	0.62	0.11 x 0.09	2.74	Whole

727	0.78	0.06	2.80	Whole
749	0.64	0.12 x 0.09	2.68	¼ cleft
772	0.86	0.19 x 0.10		Box halved
807	0.18	0.07 x 0.05	2.53	Whole
989	1.35	0.13	2.95	Whole
990	1.10	0.15	2.89	Whole
996	1.50	0.18	3.06	Whole
998	1.36	0.10	2.76	Whole
999	1.58	0.09	3.00	Whole
1000	1.60	0.16 x 0.10	3.00	Box heart
1001	1.46	0.10 x 0.03		Tangentially faced
1002	1.42	0.14 x 0.14	2.96	Whole
1003	1.76	0.16 x 0.14	3.06	¼ box
1014	1.75	0.22 x 0.11	3.03	¼ cleft
1049	1.04	0.15 x 0.08	2.93	Halved

Table 2 Period 3, details of timber from walkway structure in Trench 4

Timber [989] and [999] were identified as elm, while all the other timbers were identified as oak.

Timber [667] had a mortise and timber [749] was notable for a tenon on the base indicating that these timbers had been used previously in a timber structure. Timber [772] was also reused possibly originating from a barge where it would have formed part of the frame or deck. Timber pile [1014] may have been produced from shipyard waste material.

The 25 timber piles, which had been driven into the alluvial deposits, and set in two parallel lines, could have supported a timber structure at least 12m long and 0.50m wide perhaps an elevated walkway to allow access across wet or boggy land. However some form of revetment or double fence line is also a possibility.

4.3.5 Trench 4

4.3.5.1 Tie-back to revetment

In the north-west corner of Trench 4 the base plate and metal bolt that would have formed the anchor for a tie-back for a timber revetment were found. The revetment would have formed the side of a water channel to the west and beyond the limits of the excavation. See Fig 5.

Context [734] represented the construction cut that held the anchor to which the metal tie-back was fixed. The cut measured at least 1.30m north-south and 0.40m wide and continued north beyond the area of excavation. The cut was characterised by vertical sides falling to a flat base. The highest level was at 3.53m and the lowest at 2.87m OD.

The timber anchor rested on a east-west orientated plank [1064] that was at least 800mm long, 300mm wide and 50mm thick. The base-plate for the anchor was laid north-south and was at least 2230mm long, 270mm wide and 190mm thick. The timber appeared to have been box halved. The level on the timber was at 2.87m OD. Passing through the base plate [736] was a metal bolt [735] secured on the eastern side and continuing beyond the limits of the exaction to the west.

The backfill that covered the tie-back was a silty mortar clay mix [733]. The fill [733] was supposedly truncated from above by a second pit cut [732] (fill [731]). However it seems likely that this feature was actually a continuation of the construction cut

[734] and that deposit [731] represents the top fill of that cut. The highest level on [731] was at 3.72m OD.

*4.3.5.2 Made ground (*c *1660–1680)*

In the south-east corner of Trench 4, in south facing section 46 and east-facing section 51 (not illustrated) was a sequence of silty clays (contexts [1019], [1020], [1024], [1025], [1026], [1054], [1055] and [1056]) with frequent to moderate fragments of ceramic building material and mortar *c* 0.40m thick and overlay the natural alluvial clay and probably represents the deliberate raising and consolidation of the ground. The highest level was at 3.97m OD on layer [1019].

In plan overlying the alluvial deposits in Trench 4 was a sequence of clayey sandy silts [293], [625] and [624] which represented the anthropogenic made ground. These deposits covered an area that measured 11.0m east-west by 8.50m north-south but it was truncated to the south by later activity and continued to the east, west and north beyond the area of excavation. The highest level on this horizon was at 3.93m OD. Contexts [625] and [624] were notable for frequent fragments of brick, mortar and coal. Clay tobacco pipe dating to 1660–1680 recovered from layer [625] may be an indication that these deposits were laid down sometime in the late 17th century. However the pottery recovered from [625] has been dated to 1830–1900 and is probably intrusive.

In the north-east sector of Trench 4 was a sandy silt [568]/[660] with frequent fragments of ceramic building material, mortar and charcoal/coal that measured 9.0m east-west and 4.0m north-south. This deposit represented for the most part level made ground but at its east end sloped towards the Tumbling Bay Stream. The highest level was at 4.10m OD falling over a distance of 1m to 3.69m OD.

4.3.5.3 Building 1

See Fig 5.

Truncating the made ground was a construction cut [993] for a brick wall foundation [991]. As recorded in plan the construction cut measured 5.05m east-west, was 0.40m wide and 0.18m deep. It was characterised by vertical sides falling to a flat base. However the cut and the brick foundation were truncated by a robber cut. All that survived of the foundation [991] was the bottom two brick courses. The bricks were on bed with a row of header abutting a row of stretchers and bonded with a white mortar. They were in an orange fabric (3032NR3033) unfrogged and date to 1664–1725. The foundation was east-west aligned and measured 3.94m long, 0.35m wide and was 0.13m high. The highest level was at 3.61m OD. The backfill to the construction cut was a clay [1063] with frequent fleck and fragments of ceramic building material and charcoal.

The remnants of another east-west aligned wall foundation [645] was found on the north side of Trench 3. The foundation [645] was built with orange fabric (3033) unfrogged bricks (230mm x 100mm x 70mm) that date to 1450-1700. The 3 surviving brick courses were bonded with off white chalk/lime mortar with occasional charcoal inclusions. Here the wall foundation had been heavily truncated by later robbing so that only a stretch remained measuring 0.60m long by 0.50m wide and 0.20m deep.

If the two wall foundations were part of the same structure they could represent a building that measured *c* 5m east-west by 3m north-south.

4.3.5.4 Demolition of Building 1

Truncating foundation [645] was a large rectangular pit (cut [684]) measuring 6.74m north-south by 6.43m east-west and 0.83m deep. The cut was characterised by near vertical sides falling to a flat base. The pit was filled with demolition material of broken brick and tile, crushed mortar and clay [506].

Truncating the base of pit [684] and covered by the fill [506] were two parallel east-west aligned gullies [705] and [707]. Cut [705], measured 3.27m long, was 0.21m wide and 0.20m deep, butt ended to the east but continued beyond the limits of the excavation to the northwest. The cut was characterised by near vertical sides falling to a slightly concave base. One metre to the south of gully [705] was a second similar linear cut [707], which measured 5.10m long by 0.24m wide and 0.10m deep. Both features were filled with a similar clayey silt [704] and [706] with frequent fragments of mortar and occasional fragments of burnt clay, coal and ceramic building material.

Both pit [684] and gullies [705] and [707] are probably associated with the demolition and robbing of Building 1.

Context [997] represented an east-west aligned feature at least 2.75m long, 0.86m wide and 0.34m deep. The cut was filled with silty clay [992]. This feature was probably a robber trench that reduced foundation [991].

On the west side of Trench 4 truncating the made ground [293] was a possible pit [961] that measured 0.78m by 0.28m east-west and was 0.36m deep but continued beyond the limits of the excavation to the west. The fill was a sandy silty clay [960]. Clay tobacco pipe from the fill is dated to 1580-1910. This feature could be associated with the activity represented in Period 3.

4.3.5.5 Made ground

Recorded in the south facing section 27 (not illustrated) was a sequence of dumped deposits of silty clays [501], [502] and [503] that covered fill [506] and were probably laid down to consolidate the ground. The highest level in the sequence was on [502] at 4.15m OD.

To the north-west of Trench 4 and covering the fill [506] were two reddish brown organic layers [395] and [394] probably representing the same deposit but separated by a later intrusion (cut 332]. The extent of these deposits was 3.60m N-S by 2.20m east-west and they were between 0.05m and 0.08m thick. The highest level was at 3.93m OD on layer [394]. Layer [394] was sampled (<11>) for environmental analysis.

Overlying layer [394] was a thin layer of silty clay [342] containing frequent fragments of charcoal, burnt flint and ceramic building material. In plan this layer measured 2.50m north-south by 1.70m east-west. The highest level was at 3.95m OD. Pottery recovered from this deposit dates to 1630-1680, and clay tobacco pipe to 1580-1910.

*4.3.5.6 Drainage gullies (*c *1700)*

Cut [332] (fill [331]) measured 9.50m in length, was 0.45m wide and 0.14m deep but continued to the north and south beyond the limit of excavation, and truncated the layers [342] and [395]. The sides were steeply sloping, falling to a flat base that inclined gently to the south. The highest level was at 3.98m OD and the lowest was at 3.80m OD. The fill included broken brick, mortar and clay. Pottery recovered from the fill is dated 1630-1846 and the clay tobacco pipe dates to 1660-1710. The broken brick may have been deliberately placed to facilitate drainage.

To the south gully [332] was truncated by a probable recut [613] (fill [612]). The gully [613] was at least 2.05m long, 0.75m wide and 0.25m deep. The cut was characterised by sloping sides falling to a slightly concave base. The fill was a gravely clay.

A second linear cut [393] (fill [392]) aligned parallel to [332] also truncated layer [395]. The gully [393] measured 2.44m north-south, 0.40m east-west and was 0.16m deep, but continued south beyond the limit of excavation. The cut was characterised by steeply sloping sides falling to a flat base. Broken brick/tile and clay filled the gully. Pot found in the fill [392] is dated to 1580-1700 and the clay tobacco pipe dates to 1580-1910.

4.3.5.7 Postholes

Two postholes [517] and [581] were recorded on the west side of Trench 4 set 3.15m apart on a north-south axis. A third posthole [315] was set 4.0m to the east of posthole [517]. Pottery from posthole [517] dated to 1700-1900. Details of the postholes are given in Table 3 below.

Cut	Fill	Shape	Base	Dimensions (m)	Depth (m)
517	516	Ovoid	Rounded	0.33m x 0.32m	0.19m
581	580	Circular	Rounded	0.30m dia	0.20m
315	314	Square	Flat	0.30m x 0.25m	0.07m

Table 3 Period 3, details of postholes from Trench 4

The postholes described above do not appear to be part of a building but may have formed the corner of an enclosure, as they appear to demarcate an area to the south and east occupied by Building 2.

*4.3.5.8 External Surface (*c *1700)*

Whatever structure the postholes [517] and [581] represented it may not have been standing for long as they were partially overlain by a layer of sandy silty clay [333] that also covered gully [393]. The layer measured 5m north-south, 2.30m east-west and was *c* 0.12m thick. It continued both to the north and south beyond the limits of the excavation. Pot dating to 1630-1680 and clay tobacco pipe dated to 1700-1710 was found in layer [333].

Layer [333] was in turn covered by a silty mortar spread [302] that measured 5.0m north-south and 1.0m east-west and continued beyond the limits of excavation to the north and south. The highest level was at 4.17m OD. This mortar deposit is likely to have been put down during the construction of Building 2.

Partially overlying gully [332] was a sequence of compacted gravel layers [279], and [210]. In plan these deposits covered an area that measured 5.0m north-south and 3.32m east-west and continued to the north and south of the limits of excavation. The highest level was on [210] at 4.18m OD. Pottery from [279] dates to 1630-1700 and the clay tobacco pipe to 1680-1710. These gravel layers may have formed part of a north-south aligned road or a metalled surface to the west of Building 2.

On the south side of the trench, in section 33 (not illustrated) stratigraphically above the fill [612] was cut [812] which may have been a tip line rather than a real feature. A sequence of crushed mortar and broken brick and tile [811], sandy silty clay [810], gravel [809] and clayey silt [808] overlay cut [612]. These deposits appear to be part of the sequence of dumped deposits that formed a surface. The highest level on this made ground was on layer [808] at 4.08m OD. Pottery from layer [810] has been dated to the 17th–18th century.

*4.3.5.9 Building 2 (with furnace) (*c *1700)*

See Fig 6.

Context [574] represented the construction cut for a sunken brick structure probably a furnace. The construction cut aligned NW–SE was rectangular in plan, but narrowed halfway along its length. Overall the cut measured 3.32m long by 1.38m wide narrowing to 1m. In profile the cut had vertical sides falling 0.46m to a flat ledge *c* 0.30m wide before a vertical break of slope and a fall of 0.07m to a flat base. The highest level was at 3.92m OD and the lowest was at 3.28m OD.

The cut [574] was lined with 6 courses of unfrogged stock moulded bricks [490] (fabric 3032nr3033 and 3033) bonded with a grey/pale yellow lime mortar. The bricks have a latest date of 1664–1725. Between the brick lining [490] and the cut [574] was a silty clay [573] backfill. Internally the furnace measured 2.50m by 0.80m wide narrowing to 0.50m in width.

The brick structure had a basal fill of fire rake-out deposits up to 0.20m thick, contexts [489] and [515] and both deposits were sampled for environmental analysis (<15>) and (<12>) respectively. Interestingly in layer [489] fragments of copper alloy slag were found suggesting that the furnace might have been part of a foundry or smithy.

The brick furnace appears to have been at least partly enclosed within a brick built structure (Building 2). The building, which had been laid out on a NW-SE alignment, measured 5m by at least 4.50m but it was truncated to the south by later activity.

Context [954] represented the construction cut for a NW–SE aligned wall foundation [442]. The cut measured 3.90m long, 0.28m wide and 0.12m deep and had vertical sides falling to a flat base. Only the lower two courses of the foundation survived built with unfrogged stock moulded bricks (fabric 3032nr3033, 3039, 3042), bonded with pale yellow lime mortar and laid flat in header fashion. The overall dimensions of this stretch of masonry were 2.25m in length, 0.24m wide and 0.12m high. The highest level on the brick-work was 3.85m OD. A sandy clayey silt [953] backfilled the construction cut. This wall foundation abutted the southern half of the west side of the furnace. The latest dated brick of [442] was 1650–1850.

Context [951] represented a SW-NE aligned construction cut for brick foundation [790]. The cut was characterised by near vertical sides falling to a flat base and while

the cut at its west end had been truncated at its east end it was T shaped. The cut was at least 1.26m long, 0.30m wide, and 0.22m deep. The brick-work [790], which measured 1.27m long 0.22m wide, indicated that there was a short return to the south at the east end. The foundation [790] was built in similar fashion to that of [442] and the bricks of fabric 3032nr3033 dated to 1664–1725. The highest level on [790] was at 3.72m OD.

The wall foundation continued further to the west and here it was assigned the context number [441]. The overall length of the wall [790]/[441] was 2.80m but at its west end the masonry had been truncated by later activity. It seems likely that the wall foundation would have continued further to the west until it abutted the east wall of the furnace. The highest level on [441] was at 3.83m OD. Contexts [441]/[790] represented the remains of NE–SW aligned foundation that formed the north wall of Building 2.

Truncating wall [790] was a posthole [746] (fill [745]). The square posthole was 0.28m x 0.28m and 0.21m deep with steeply sloping sides falling to a flat base. The fill was a clayey silt. The posthole may have been part of a timber repair to the NE corner of the building or represent part of the original timber framing to the building.

Context [958] represents the construction cut for foundation [791]. It measured 1.74m long, 0.23m wide and 0.07m deep and held a single course of bricks [791]. The bricks were unfrogged stock moulded of fabric 3033, with a latest date of 1450–1700. The highest level on [791] was 3.72m OD.

Wall [791] probably continued a little further to the south where it was assigned contexts [963] for the cut and [962] for the masonry. The foundation [791]/[962] was on the same NW–SE alignment as the southern return to [790]. Overall [791]/[[962] had a length of 2.40m but it was truncated at its southern end.

The *c* 1.50m gap between the north end of [791] and the stub south return to [790] may indicate an entrance to Building 2.

A shallow pit was recorded (cut 973] fill [760] in the possible entrance to Building 2. This ovoid feature, which had vertical sides falling to a flat base, measured 0.76m by 0.55m and 0.10m deep. The pit was filled with compacted clayey silt [760]. It may represent a repair to the floor within the entrance.

To the south of wall [790] and east of the foundation [791] were deposits [984] and [763] that may have been the remains of the floor or sub-floor to Building 2.

Layer [984] comprised compacted silty clay with inclusions of frequent fragments of ceramic building material, charcoal, cu alloy and mortar. the deposit measured 2.90m east-west by 2.80m north-south. The highest level was at 3.61m OD. It was sampled (<45>) for environmental assessment.

Overlying [984] was a compacted silty sandy clay [763] again with inclusions of moderate amounts of charcoal/coal fragments and occasional fragments of copper alloy. The layer measured 4m north-south by 2.86m east-west and was 0.10m thick. The highest level was at 3.71m OD. The deposit was sampled <44> for further analysis. Clay tobacco pipe recovered from the layer could only be given a wide date range of 1580–1910.

4.3.5.9.1 SUNKEN FEATURE WITHIN BUILDING 2

To the south, the layer [763] was truncated by a rectangular pit [970] that measured 1.80m east-west, 0.50m north-south and 0.30m deep but it was truncated to the south by later activity. The cut was characterised by vertical sides falling to a flat base and was lined with timber [980]. Unfortunately the wood was too decayed to survive lifting. The pit was filled with a sandy clay [969] with lenses of charcoal. The fill was sampled (<43>) for environmental analysis. It may be that this timber lined pit was associated with the industrial processes that were carried out in Building 2.

4.3.5.9.2 REPAIR TO FLOOR?

Three shallow features were recorded that truncated floor layer [763] and it is possible that they may represent patch repairs to the surface. Cut [926] (fill [925]) was sub-circular and measured 0.52m by 0.30m and 32mm deep. The fill was a silty clay and produced clay tobacco pipe dated to 1580-1910.

Pit [927] (fill [928]) was rectangular and measured 0.90m x 0.50m and 0.07m deep with steeply sloping sides falling to a flat base. A loose crushed mortar, fragments of ceramic building material and silt filled the feature.

Cut [685] (fill [686]) was linear and measured 0.97m north-south by 0.23m east-west and 0.03 -0.05m deep with steeply sloping sides falling to a flat base. The fill was a sandy silt from which pottery dating to 1550-1900 and clay tobacco pipe dating 1580-1910 was recovered.

4.3.5.9.3 POSTHOLES INTERNAL TO BUILDING 2 (AFTER 1680)

A series of postholes internal to Building 2 were recorded. A similar sandy silt to [686] with inclusions of fragments of ceramic building material, charcoal/coal, chalk, mortar, shell and small sub-angular pebbles filled these features. The putative postholes [683], [709], [720], [724] and [756] form a north-south line parallel with the east side of the building but their purpose is unclear. In fill [708] was pottery dated to 1680–1800.

Feature [878] was located on the west side of the building and although it may represent a post pit its purpose is again uncertain. Possible posthole [876] is immediately to the south of wall line [442] and may represent a structural element to the building perhaps a door post.

The details of the postholes internal to Building 2 are given in the table below.

Cut	Fill	Shape	Base	Dimensions (m)	Depth (m)
683	682	Sub square	Flat	0.14m x 0.10m	0.04m
709	708	Triangular	Pointed	0.11m x 0.10m	0.10m
720	719	Square	Pointed	0.07m x 0.07m	0.17m
724	723	Rectangular	Rounded	0.14m x 0.10m	0.22m
756	755	Circular	Rounded	0.13m x 0.13m	0.40m
878	877	Rectangular	Flat	0.51m x 0.28m	0.05m
876	875	Rectangular	Flat	0.28m x 0.26m	0.05m

Table 4 Period 3, details of postholes internal to Building 2, Trench 4

4.3.5.10 Postholes external to Building 2 (after 1680)

Details of all the postholes and post pits discussed below are given in Table 5 below.

Cut	Fill	Shape	Base	Dimensions (m)	Depth (m)
678	676, 677	Sub Circular	Rounded	0.26m x 0.23m	0.30m
669	668	Square	Flat	0.34m x 0.34m	0.22m

694	693	Square		0.18m x 0.18m	0.03m
728	725	Rectangular	Flat	0.28m x 0.20m	0.05m
696	695	Sub-rectangular	Uneven	0.40m x 0.30m	0.23m
938	937	Circular	Pointed	0.19m x 0.15m	0.10m
713	716, 712	Sub-rectangular	Flat	0.32m x 0.21m	0.07m
711	710	Circular	Flat	0.60m x 0.60m	0.14m
566	565, 564	Circular	Flat	0.45m x 0.35m	0.27m
560	559	Rectangular	Flat	0.20m x 0.14m	0.27m
558	557	Circular	Flat	0.38m x 0.32m	0.12m
556	555	Circular	Flat	0.40m x 0.36m	0.20m

Table 5 Period 3, details of postholes external to Building 2, Trench 4

To the east of Building 2, postholes [678], [669], [694], [728], [696], and [938] form a rough north-south line over 5.0m long and spaced between 0.70m and 1.50m apart, except for the southern two postholes which were placed only 0.10m away from each other. See Fig 6. Posthole [678] was notable for a fill of decayed wood that probably was the remains of the actual post. From the post packing [676] came a piece of clay tobacco pipe dated to 1580–1910. Details for these postholes are given in the table below.

Sited on the north-east corner of Building 2 was the possible post pit [711] and 1.50m to the north, the posthole [713]. It may be that these two features were associated. From post pit [711] came pottery dated to 1680-1800.

A group of four possible post pits was located *c* 4.0m to the north of Building 2. Two [560] and [556] were set on a north-south axis about 1.30m apart. Two more postholes [558] and [566] were placed 0.50m apart and were positioned 1.50m to the west of the north-south line and at right angles to it All the postholes were characterised by steeply sloping or near vertical sides falling to a flat base. Posthole [566] was notable for an upper fill [564] of burnt material suggesting that the post may have been destroyed by fire. Pottery recovered from [564] is dated 1550–1700.

4.3.5.11 External surface

To the north and east of Building 2 possible surface makeup layers that may have been contemporary with the building were recorded.

Context [921] represented a compacted clay layer, abutting the external face of wall [791] and measured 2.52m north-south by 1.13m east-west.

To the north of Building 2 was a compacted sandy clay [774] with frequent fragments of ceramic building material, mortar and chalk that measured 3.12m east-west by 2.0m north-south.

Truncating layer [774] to the north-east of Building 2 was a gully [741] (fill [740]) that may have drained excess surface water away from the Building. The cut was 1.55m long, 0.23m wide, 0.08m deep and continued beyond the area of excavation to the east. The cut was characterised by sloping sides falling to a slightly concave base that inclined towards the east. The fill was a sandy clayey silt from which pottery was recovered that dated to 1680-1900 and clay tobacco pipe that dated to AD 1580-1910.

*4.3.5.12 Millrace (*c *1700-1740)*

See Fig 6.

To the south of Building 2 was a timber reveted water channel that was probably a millrace. A mill would have been required to provide the power to drive the bellows and other machinery that would have operated in the foundry.

A construction cut [1091] at least 2.50m wide was reveted with timbers [994], [995] [1066] – [1088] and [1092] that created a channel at least 5.50m long, 0.60m wide and 1.15m deep that continued both to the south-west and the northeast beyond the limits of the excavation.

A deposit of gravely sand [952] and a sequence of silty clays [950], [930], [968], [614], [627] and [967] 1.25m thick (see section 42 (see Fig 13) represent the deliberate backfilling of the construction cut [1091]. Deposits [950], [952] and [614] were sampled (<41>, <42> and <21>) for environmental analysis. Pottery dating to 1630-1650 and clay tobacco pipe dated 1580-1900 were recovered from fill [950]. In deposit [930] pot was found dated to 1660-1700 and clay tobacco pipe dating to 1700-1740. From fill [614] came pot sherds dating to 1690-1700 but the clay tobacco pipe dated 1840+ (this was probably because of an error in finds labelling). Fill [627] produced pottery dated 1690-1730 and clay tobacco pipe dating to 1700-1740.

A silty clay [929]/[1090] filled the channel of the millrace. Pottery found in [929] dates to 1670-1900 and the clay tobacco pipe dated to 1700-1740. Some residual medieval pottery was also recovered from fill [1090] dated to 1175-1400.

4.3.5.13 Masonry drain

In the north-east corner overlying layer [568] was a reddish brown scorched clay layer [630]. The layer measured 1.85m north-south by 1.55m east-west and was 0.05m deep. The highest level was at 3.94m OD.

Truncating the burnt clay layer [630] was a masonry built drain. Context [633] represented the construction cut for this drain. The cut butt ended to the west and truncated to the east. It measured 2.70m long, 0.41m wide and 0.38m deep. The sides were steeply sloping falling to a rounded base that inclined to the east.

A brick lined square shaft at the west end fed a cobble lined drain, which was partially capped by green sandstone slabs. A clayey silt [636] backfilled the construction cut. The fill of the drain was a sandy silt [634] from which pottery dating to 1680-1700 was recovered.

It seems likely that the scorched layer and the drain are linked in some way with the furnace/foundry (Building 2). They may represent the footprint of another structure or the remnants of an external surface.

4.4 Period 4 (mid–late 18th century)

Period 4 represents the demolition of Building 2, during the mid-late 18th century (Fig 7). Evidence for this destruction is provided with the filling in of the furnace and postholes that may represent the position of posts that temporarily supported Building 2 as it was dismantled and robber trenches that reduced the wall foundations.

The millrace from Period 3 appears to have silted up, and may also have been partly dismantled. Pottery dating to 1660–1700 and the clay tobacco pipe dating to1700-

1740 from fill [930] within the millrace suggests this occurred during the first half of the 18th century.

During this phase, after the demolition of Building 2, the site appears to have been an open area. It is notable that animal bone representing food remains are absent from the bone assemblage and the majority of the animal bone was horse for these deposits.

Pottery from Period 4 continued to be dominated by table ware with a small number of tea wares suggesting that domestic occupation continued in the locality.

Wine bottles and glass phials also attest to continued occupation in close proximity to the site in the 18th century.

4.4.1 Trench 1

See Fig 7.

Truncating layer [160] was a small oval pit [201] (fill [199]) that measured 0.40m by 0.28m and was at least 0.19m deep. The cut was characterised by steeply sloping sides falling to a flat base. The fill was a clayey silt. The feature may have been a posthole but because of its isolated position further interpretation is difficult.

Layer [160] was truncated by a large pit [175] (fills [174], [173] and [172]) recorded in plan and section but which was not excavated for health and safety reasons. The pit was sub-circular with sloping sides falling to an irregular base and measured 3. 36m north-south by at least 2.25m east-west and was at least 0.79m deep. The fills were a sequence of clays overlain by silty clays.

Cut [165] (fill [164]) on the south side of the trench also truncated layer [160] and may be the same as feature [175]. The cut measured 2.06m east-west, by at least 0.52m north-south and was at least 0.44m deep. The cut was characterised by sloping sides falling to a slightly concave base. The fill was a clayey silt with frequent snail shell, and fragments of ceramic building material, mortar and charcoal. The nature of the fills both from cuts [165] and [175] indicates that the hole could have remained open and have silted up over time suggesting a pond as a possible interpretation for the feature.

Partially overlying fill [173] was a layer of clayey silt [200]. In plan the deposit measured 4.40m east-west by 0.70m north-south and it was at least 0.30m thick.

4.4.2 Trench 2

See Fig 7.

Truncating the made ground deposits [52] and [53] was a cut feature [51] (fill [50] recorded only in section 2 (Fig 12). The cut, which measured 0.38m north-south and was 0.28m deep, had sloping sides falling to a concave base. The highest level was at 4.06m OD. The fill was a clayey silt with frequent fragments of ceramic building material and mortar. For stratigraphic reasons the feature was assigned to Period 4.

4.4.3 Trench 3

See Fig 7.

Truncating the made ground [281] was a linear cut [274] (fill [273]) which was east-west aligned. It was at least 1.0m long, 0.40m wide and 0.44m deep. The cut was

characterised by vertical sides falling to a flat base. The fill was a sandy silt overlying a brick base. The feature was thought to be a drain and could date to the 18th century.

4.4.3.1 Tumbling Bay Stream

The Tumbling Bay Stream remained an open waterway evidenced by a water-lain silty sand [257] that accumulated on the bed of the stream. The deposit measured 5.0m north-south, 3.10m east-west and was *c* 0.10m thick. Pot found in this deposit was dated to 1550-1700.

4.4.4 Trench 4

See Fig 7.

4.4.4.1 Disuse of the furnace

The disuse of the furnace is marked by the filling in of the sunken brick structure with demolition debris [488] comprising broken brick and crushed mortar overlain by a silty clay with broken brick and crushed mortar [473].

Partially overlying the fill [473] and covering the west side of the brick lining for the furnace was another layer of building rubble [389] that measured 3.82m north-south by 1.32m east-west. The highest level on [389] was at 3.92m OD.

A series of linear cuts was recorded that are likely to relate to the robbing of the walls of the furnace. Truncating the demolition layer [389] and aligned along side the east wall of the furnace was a linear cut [388] (fill [387]). The cut measured 1.28m north-south, 0.28m east-west and was 0.45m deep. It was characterised by near vertical sides falling to a flat base and was filled with sand, broken brick/tile, crushed mortar and silt.

Beside cut [388] (probably actually part the same feature) was another linear feature [297] (fill [296]), which measured 1.23m north-south, 0.38m east-west and 0.14m deep. The cut was characterised by near vertical sides falling to flat base. The fill was a gravely silt which produced pottery dated 1760-1830 and clay tobacco pipe dating to 1580-1910.

The remnants of a brick surface [407] capped demolition layer [389] and this may have been a temporary floor. The bricks were unfrogged of orange fabric, measured 105-100mm x 100-105mm x *c* 60-55mm and were laid on bed bonded with a yellow/grey sandy mortar. The highest level on [407] was at 3.95m OD.

*4.4.4.2 Demolition of Building 2 (*c *1760)*

A group of postholes and post pits was recorded that may represent the temporary propping up of the building during the demolition process. All the postholes were filled with a similar mix of clay and demolition debris. Posthole [689] was notable because it contained the decayed remains of a post [688] and from the backfill [687] came pottery dated 1760-1780. Pottery from posthole [758] was dated to 1720-1780. Clay tobacco pipe recovered from post pit [475] is dated to 1660-1680.

Details of the postholes are given in Table 6 below.

Cut	Fill	Shape	Base	Dimensions (m)	Depth (m)
475	474	Square	Flat	0.69m x 0.68m	0.25m
487	486	Square	Flat	0.45m x 0.40m	0.25m

Cut	Fill	Shape	Base	Dimensions (m)	Depth (m)
375	374	Square	Flat	0.42m x 0.36m	0.36m
670	671	Square	Flat	0.24m x 0.23m	0.15m
758	757	Rectangle	Flat	0.34m x 0.26m	0.11m
689	688, 687	Rectangle	Flat	0.50m x 0.36m	0.20m

Table 6 Period 4, details of postholes associated with demolition of Building 2, Trench 4

Evidence of the actual demolition of the walls of Building 2 was provided with the recording of robber trenches that had at least in part reduced the walls. Truncating the wall [442] was the cut [295] (fill [294]) which measured 1.26m north-south, 0.27m east-west and 0.16m deep. The cut had near vertical sides falling to a flat base. The fill was a clayey silt with frequent fragments of ceramic building material and mortar that produced pot sherds dating to 1760-1830 and clay tobacco pipe that dated to 1580-1910.

Truncating the west end of foundation [441] was an east-west aligned cut [306]. This robber cut measured 0.86m long, 0.31m wide and 0.11m deep, and had vertical sides falling to a flat base. The fill was a silty clay with occasional fragments of ceramic building material and mortar.

Timber-lined pit [970] an internal feature of Building 2 also seems to have gone out of use and was truncated from above by an oval cut [956] that measured 1.73m east-west, 0.96m north-south and was 0.16m deep but truncated to the south by cut [615]. Cut [956] was characterised by concave sloping sides falling to a flat base. The fill was a silty clay [955] with frequent fragments of mortar, ceramic building material, and occasional shell. Pottery from [955] dates to 1570-1700 and the clay tobacco pipe dated 1700 – 1770.

Truncating the south side of Building 2 and pit [956] was a possible robber trench [615] that also cut the top part of the revetment of the millrace. The feature was at least 9m long, 2m wide and *c* 0.35m deep. The sides recorded in section were sloping to a flatish base.

In section 42 (see Fig 13) the fill of cut [615] was a silty clay [966] with moderate amounts of ceramic building material fragments and small rounded pebbles and occasional fragments of charcoal. The deposit was about 0.25m thick and the highest level was at 3.89m OD. Possibly an equivalent deposit to [966] was the silty clay [957] exposed on the east side of the trench. As excavated [957] measured 4.85m east-west by 1.40m (max) north-south. The highest level was at 3.74m OD. Pottery found in this deposit has been dated to 1700-1800 and the clay tobacco pipe to 1700-1710.

Layer [966], in section 42 (see Fig 13) was overlain by a silty sandy gravel [537]. The highest level was at 4.17m OD. The equivalent deposit recorded in plan was layer [974] a compacted silty clay with frequent fragments of brick and tile.

Recorded in the south-west corner of Trench 4 overlying layer [974] was a sequence of dumped deposits that was probably laid down to consolidate the soft ground. Layer [587] was a compacted gravely sandy silt overlain by deposits of broken brick and tile mixed with mortar, layers [644] and [586]. These deposits appear to have formed a surface between 4.19m OD and 4.12m OD.

A metre east of the sequence described above was a layer of compacted gravely silt [788]. This layer measured 2.06m east-west and 1.40m north-south and was at 4.04m OD.

4.4.4.3 Gully/drainage ditch

Truncating gravel surface [210] was a north-south aligned shallow drainage ditch cut [209] (fill [239], [208]) The gully was at least 5.0m long, 0.54m wide and 0.25m deep and continued beyond the area of excavation to the north and south. It was characterised by steeply sloping sides falling to a concave base. The lower fill was a silty gravel [239] and the upper fill a gravely sand [208]. Clay tobacco pipe found in [239] is thought to date to the 18th century.

4.4.4.4 Pitting (mid 18th century)

On the west side of the trench was a sequence of inter-cutting pits the earliest was a large sub-rectangular pit [972] (fill [971]) that measured 1.72m by 1.50n by 0.37m deep and had vertical sides falling to a flat base. The fill was a sandy silt which produced pottery dating to 1740-1780 and clay tobacco pipe dated 1700-1770. An interesting piece of bottle glass sf23) was also found in [971] which had a seal dated 1732. The feature may have been a rubbish pit.

A smaller pit [949] (fill [948]) truncated the pit [972]. The ovoid shaped cut [949] measured 0.48m by 0.46m and was 0.40m deep but it was truncated to the south by a later intrusive feature. The cut was characterised by vertical sides falling to a flat base. The fill was a clayey silt with occasional fragments of ceramic building material and animal bone.

Truncating the west side of pit [972] was a rectangular pit [947] (fill [946]) that measured 0.70m east-west by 0.70m north-south and was 0.31m deep. The cut was characterised by near vertical sides falling to a stepped in flat base. The fill was a sandy silty clay [946].

Overlying pit [949] was compacted gravely sandy silt [747]. The silt was overlain by broken tile [748]. These deposits appear to have formed the remnants of a surface that measured 2.80m by 1.50m, at between 4.27m OD and 4.17m OD.

Truncating surface [747] was a probable square posthole [722] that measured 0.36m by 0.30m and which was 0.14m deep. The cut was characterised by near vertical sides falling to a flat base. Pottery recovered from fill [721] was dated to 1760-1830 and the clay tobacco pipe to 1580-1910.

4.4.4.5 Fence line

In the south-east corner of the trench three regularly spaced postholes formed what may be a north-south line 1m long (centre to centre).

Details are given in the table below.

Cut	Fill	Shape	Base	Dimensions (m)	Depth (m)
935	936	Circular	Flat	0.42m x 0.40m	0.20m
933	934	Ovoid	Flat	0.32m x 0.22m	0.15m
931	932	Ovoid	Flat	0.46m x 0.36m	0.16m

Table 7 Period 4, details of postholes in the south-east corner of Trench 4

Three wooden stakes ([777], [770] and [769]) sited *c* 4.0m to the west of the fence line discussed above were recorded driven into layer [788]. Set approximately 0.20m apart the stakes formed a north-south line 0.50m long. It is not known what activity these stakes may be related to.

On the north side of the trench an elongated pit [563] (fill [562]) was recorded. The feature measured 1.44m north-south by 0.52m east-west and was 0.26m deep and had steeply sloping sides falling to a flat base. Pottery found in the pit dates to 1770-1830 and the clay tobacco pipe to 1680-1710. However the isolated nature of the feature makes further interpretation difficult.

4.5 Period 5 (late 18th–mid 19th centuries)

Period 5 represents the redevelopment of the site in the late 18th century and its use until at least the middle of the 19th century when major ground works were again carried out (Fig 8).

At the beginning of this sequence a row of six terraced cottages (Building 3) were built on the western side of the site (Fig 8). Associated with the cottages were brick drains recorded during the machining of both Trenches 3 and 4. The cottages and their drains is discussed first, and then the stratigraphic sequence in each of the trenches in turn.

The network of drains was installed to the east of the cottages, and formed a V-shape, converging on a single drain that flowed further to the east and probably discharged into the Tumbling Bay Stream. It is likely that the drains would have been fed by down pipes channelling rainwater run-off from the roofs of the cottages.

Adjacent to the cottages was a metalled surface, probably a road. A N-S line of postholes between the putative road and the cottages may represent a garden fence.

The space between the terrace and the Tumbling Bay Stream was utilised for some commercial or industrial purpose, evidenced by a line of four sunken wooden barrels. These may have been tanks in some washing, dyeing or refining process. The concentration of the postholes and stakeholes in Trench 3 suggests a pattern of repetitive activity, perhaps associated with the calico ground that is documented to be on the site during this period.

It would appear that the six cottages revealed in the excavation are dwellings that may have housed the workers employed at the calico works. Both the cottages and the calico works are shown on the Temple Mills Estate plan of 1834. The same plan shows a narrow N-S road/track in front of the cottages and open ground marked as Calico Grounds between the cottages and the Tumbling Bay Stream. Further documentary evidence suggests that the cottages may have been standing from at least 1793. However the reference in a leasehold dated to that year is to seven brick dwellings and the first unambiguous reference to the cottages is in a lease agreement of 1821. The ceramic building material assessment because of the use of frogged brick in the structure, suggests that the cottages must post date 1750. Furthermore, the use of Roman cement and stock moulded brick suggests they may date to the early 19th century.

To the south and east of the cottages was a rectangular building (Building 4) with an adjacent cobbled yard to the east. The remains of a sunken brick surface with a drain

set into the floor may represent another building (Building 5) located *c* 11m to the east of the terrace. Buildings 4 and 5 do not appear to conform to a house plan but may represent some commercial or industrial role and may have been built post 1834 (after the Temple Mills Estate plan).

The pottery from Period 5 is again dominated by tableware, teawares and a small amount of kitchenwares. The relative paucity of pottery from a post-medieval site is perhaps explained by the fact that that only front part of the cottages fell within the area of excavation. The back properties to the cottages, where one might expect domestic rubbish pits, were beyond the limits of the excavation.

Beef and mutton dominated the animal bone assemblage, with some variety to the diet provided by the inclusion of pig, rabbit and pigeon. Some evidence of local bone working was also detected, with sawn cattle bone suggesting bone-working waste and possibly the manufacture of buttons.

4.5.1 Consolidation layers

In Trench 1 a layer of sandy silt [159] *c* 0.50m thick overlay deposits attributed to Period 4. This was recorded only in Sections 11 and 12 (not illustrated). The deposit was probably deliberately laid down to raise ground level. Its highest level was at 4.47m OD.

In Trench 2 cut feature [51] from Period 4 was a covered by a sequence of fine sandy silt [49] 0.26m thick, overlain by silty clay and gravel [48] up to 0.20m thick (see section 2 Fig 12). The level on top of this horizon of made ground was between 4.42m OD and 4.34m OD.

4.5.2 Building 3 (terraced cottages) and associated features

The front (east-facing) *c* 2m of a row of six terraced houses was exposed on the western side of the site (Fig 8). The cottages have been numbered 1–6, from north to south. Internally they were only 3.40m wide (N-S).

The central east-west aligned wall seen in cottages Nos 1, 2, 3, 5 and 6 and the two internal parallel walls in No 4 were not dividing walls but sleeper walls that would have supported a wooden floor. The single brick course recorded against the party walls would also have supported floor joists.

The construction cut for the north-south aligned front east wall [15] of the cottages was partially excavated along two short stretches of the wall against the internal face. On the north side the construction cut was represented by context [57] (fill [56]) and on the south by context [654] (fill [653]). A stretch of the construction cut on the outside of wall [15] was also excavated and represented by context [335] (fill [334]). The full width of the construction cut was *c* 1.25m and it was *c* 0.30m deep. The highest level was at 4.15m OD and the lowest at 3.83m OD. Residual clay tobacco pipe found in the backfill [653] dated to AD 1680-1710.

Wall [15] itself was built from frogged and unfrogged orange and purple fabric brick (3032, 3033, 3034). Bonded with an off-white lime mortar. Wall [15] was 22m long, 0.35m wide and 0.55m high. Built with similar materials to wall [15] and tied into it were the east-west aligned north-end wall [58] and the south-end wall [7].

At Nos 3, 4, 5 and 6, the thresholds to adjacent front doors were revealed in the excavation. Context [524] represented a single course of bricks forming a rectangular projection 1.0m north-south and 0.32m east-west that abutted the front of the cottage at No 3. These bricks could have supported a step leading to the entrance.

At No 4 context [520] represented the remains of a brick step formed by two rows of bricks laid on bed. The brick-work measured 0.74m by 0.40m. Opposite [520] and overlying wall [15] and extending into the cottage was a degraded timber [523] measuring 0.85m by 0.45m and 0.05m thick. The wood was probably part of the original threshold.

The doorway and threshold at No 5 were indicated by brickwork [130], for a brick step 0.91m north-south by 0.47m east-west, which coincided with a break in the pattern of brickwork on wall [15] represented by the context [86]. An adjacent door at No 6 was suggested by the foundation for a brick step [85] that measured 1.10m north-south by 0.36m east-west.

A change in the pattern of bricks on wall [15] opposite the brick step at Nos 5 and 6 would suggest doorways 0.85m–0.89m wide.

If the pattern of the position of the front doors was consistent then adjacent doors between Nos 1 and 2 would also have been expected.

In cottages Nos 1, 3 and 5 a stub of masonry was recorded that projected at an angle from the north wall of each cottage. It is uncertain what these remains represent but supports for internal staircases is a possibility.

The level on the sleeper walls and the threshold suggest that the floor of the cottages was probably at *c* 4.56m OD.

The masonry contexts that were assigned to the cottages are listed in the table below.

Context No	Feature	Cottage No	OD Level m OD
15	East wall	1 – 6	4.74
58	North wall	1	4.85
39	Feature against north wall	1	4.79
38	Brick course against wall [58]	1	4.45
62	Internal feature	1	4.24
37	Sleeper wall	1	4.45
88	Brick course against wall [35]	1	4.48
35	Party wall	1 & 2	4.57
87	Brick course against wall [35]	2	4.47
31	Sleeper wall	2	4.45
30	Brick course against wall [29]	2	4.45

Context No	Feature	Cottage No	OD Level m OD
29	Party wall	2 & 3	4.68
28	Brick course against wall [29]	3	4.46
524	Threshold	3	4.38
64	Internal feature against north wall	3	4.50
63	Internal feature against north wall	3	4.42
27	Sleeper wall	3	4.42
24	Brick course against wall [34]	3	4.43
34	Party wall	3 & 4	4.64
522	Threshold	4	4.49
520	Threshold	4	4.47
22	Sleeper wall	4	4.34
23	Sleeper wall	4	4.38
21	Party wall	4 & 5	4.65
130	Threshold	5	4.41
86	Threshold	5	4.56
20	Brick coursing against wall [21]	5	4.36
41	Internal feature against north wall	5	4.38
19	Sleeper wall	5	4.46
84	Brick coursing against wall [18]	5	4.42
18	Party wall	5 & 6	4.66
85	Threshold	6	4.57
83	Brick course against wall [18]	6	4.45
17	Sleeper wall	6	4.46
7	South wall	6	4.71

Table 8 List of masonry contexts assigned to Building 3, Period 5

Adjacent to the cottages Nos 2 and 3 was a layer of sandy silt, mortar and broken ceramic building material [357]. The layer measured 5.0m north-south, 0.60m east-west and was 0.14m and continued to the north and south of the area of excavation. The highest level was at 4.37m OD. The layer may have been a bedding layer for a surface contemporary with the cottages.

4.5.2.1 Drains from the cottages

Leading east from the front of the Building 3 cottages were two brick-lined drains: drain [204] that flowed from the NW to the SE and drain [507] that flowed from the SW to the NE. Both met and joined a single east-flowing drain [508] (Fig 8).

Both the construction cut [205] for the northern branch of the drainage system and the cut [509] for the southern branch were of similar proportions. They were 7.20m long 0.40m wide and 0.24m deep. The cuts were characterised by vertical sides falling to a flat base that inclined to the east falling from 4.10m OD to 4m OD. The cut [510] for the eastern arm of the drainage system was at least 2m long and the base fell to 3.85m OD.

The drainage channels were 0.10–0.15m wide and 0.20m deep. The drain [204] was built with tiles forming the base, orange fabric unfrogged brick (3032, 3034]) set on edge lining the sides and ashlar stone blocks capping the drain. The latest dated ceramic building material was 1666-1850. The highest level on the capping stones was at 4.39m OD.

Drain [507] was built with a base of reused Flemish floor tiles and the walls with unfrogged orange fabric brick (3032 and 3032nr3033). The drain was capped with reused medieval worked Reigate stone. Drain [508] was built with similar bricks to that used in [507] and [204] but here the drain was capped with brick.

Approximately 1m east of drain [508] was the remnants of buried brick feature [553] that could have formed part of the drainage system. The brick-work which was

formed with a single course of unfrogged orange fabric bricks bonded with a sandy yellow mortar measured 1.35m east-west by 0.12m north-south. The highest level was at 4.02m OD.

An indication of the date of construction for the drains came from the pottery found in the backfill [521] to the construction cut [510] which dated 1800-1900.

The drain fill [207] of [204] produced one moderately rich seed assemblage containing mainly elder seeds as well as common garden snail and other moisture and shade loving snails and the common oyster.

4.5.2.2 Metalled surface to east of cottages

Immediately to the east of the cottages were dumped deposits that possibly represent a metalled surface perhaps a north-south track/road. Context [198] represented a sandy gravely silt overlain by layer of broken brick and tile mixed with mortar [197]. Pottery recovered from layer [198] is dated to 1720-1780 and the clay tobacco pipe dates to 1820-1860. The clay tobacco pipe found in layer [197] dates to 1730-1780. These deposits may represent the makeup layers fro the surface described below.

Partially overlying layer [198] was a compacted silt sand and gravel [143] which in turn was partially overlain by broken flagstones set in mortar [191] and a more loosely compacted gravely sandy silt [150]. Layers [143], [150] and [191] are thought to form an external surface perhaps a north-south road measuring 5.0m long and 2.30m wide but the surface continued to both the north and south beyond the area of excavation. These surface deposits were encountered between 4.35m OD and 4.32m OD.

A north-south line of postholes that stretched over 4.20m was recorded immediately to the west of the metalled surface described above. These postholes may represent a fence line between the cottages and the putative roadway. Pottery from posthole [217] dates to 1780-1900, posthole [221] dated to 1750-1775, post-medieval pottery came from posthole [229] and pot from posthole [703] dates to 1810-1900. Clay tobacco pipe was found in postholes [221], [223], [225], [229] and [703] dating to 1580-1900, in posthole [229] clay tobacco pipe dated to 1700-1740 was found and 19th-century clay tobacco pipe was recovered from posthole [217].

Details of the postholes are given in the table below.

Cut	Fill	Shape	Base	Dimensions (m)	Depth (m)
217	216	Circular	Flat	0.46m x 0.43m	0.17m
219	218	Circular	Concave	0.30m x 0.26m	0.10m
221	220	Circular	Concave	0.39m x 0.38m	0.20m
223	222	Ovoid	Concave	0.30m x 0.24m	0.20m

225	224	Circular	Concave	0.28m x 0.27m	0.16m
227	226	Ovoid	Concave	0.37m x 0.30m	0.25m
229	228	Ovoid	Concave	0.33m x 0.28m	0.20m
703	702	Rectangular	Flat	0.45m x 0.35m	0.20m

Table 9 Details of postholes cut into metalled surface to east of cottages (Building 3), Period 5

4.5.3 Building 4 and associated features (c 1830–50)

Contexts [527], [528] and [529] represented the three surviving sides of a brick built building *c* 4.20m square (Fig 8).

Context [528] represented the surviving remains of the south, east-west aligned wall of Building 4. The wall was 3.60m long, 0.23m (2 courses) wide and had a maximum height of 0.30m. Three courses of brickwork survived built in orange fabric (3032 [nr3033], 3034) reused stock bricks latest dated brick 1666-1850. The bottom course was formed with header bricks laid on edge, which then changed a third of the way along its length to headers laid on bed. The second course was predominantly headers laid on bed and in the third course the bricks were laid stretcher fashion. The bonding material was a gravel cement.

The east wall was represented by [528], a north-south return [527]. Context [527] was 1.86m long, 0.22m wide and 0.25m high. The bottom course was formed of headers laid on edge, the second course of bricks was laid predominantly stretcher fashion and the third course was laid as headers on bed. Two different mortars were used in the bonding of the bricks one was Portland cement. The brick fabric was similar to that used in wall [528].

The west side of Building 4 was represented by north-south return, [529], that used similar materials to those of [528] and [527]. Wall [529] was 4.30m long, 0.24m wide and survived to a maximum height of 0.25m. Again the bottom course of bricks comprised headers laid on edge and the bonding material was a gravel cement.

The north side of Building 4 appearing to be missing. However, two probable post-pits along what may have been its alignment were recorded. Cut [943] with (fills [942], [941]) was rectangular in plan with steeply sloping sides falling to flat base. The pit measured 1.26m east-west, was at least 0.80m north-south and was 0.61m deep. The lower fill was a silty clay [942] 0.26m deep and this was covered by an upper fill of gravely clayey silt [941]. In fill [941] pottery dating to 1820-1900 and clay tobacco pipe dated to 1820-1860 were found. A metre to the south-west of post-pit [943] a second probable post-pit was recorded [554] (fill [543]). The rectangular shaped cut measured 0.66m east-west by 0.43m north-south and was 0.26m deep. The cut was characterised by near vertical sides falling to a flat base. The fill was a gravely silt that produced pottery dated to 1760-1830.

In the north-west corner of Building 4 a sequence of post-pits may represent the repeated rebuilding and repair to that corner. Post pit [675] (fill [754], [674]) was roughly circular, measured 1.04m by 1m and 1.14m deep and was characterised by near vertical sides falling to a stepped in flat base. Context [754] represented degraded wooden post and context [674] the silty clay backfill. In the post-pit pottery which dated to 1810-1830 and clay tobacco pipe thought to date to the 17th or 18th century was found. Post-pit [675] was truncated by a second post-pit [673] (fill [661], [672], [739]). The cut [673] was rectangular in plan, measured 0.44m east-west, 0.36m

north-south and 0.40m deep and continued west beyond the area of excavation. The cut was characterised by near vertical sides falling to a concave base. The pit held degraded wooden post [661] and was backfilled with a gravely clay [672] overlain by a silty clay [739]. Pottery found in the fill [672] dates to 1810-1830 and the clay tobacco pipe dated to 1580-1710. Fill [739] produced pottery dating to 1780-1840 and clay tobacco pipe that dated 1780-1830. A probable third post pit [738] (fill [737]) truncated pit [673]. The ovoid cut [738] measured 0.72m by 0.60m and was 0.30m deep with near vertical sides falling to a concave base. The clayey silt fill produced pottery dating to 1770-1840 and clay tobacco pipe dated 1580-1910.

4.5.3.1 Sub-structure of Building 4

A series of postholes and timber posts were cut into, or driven into, the ground in the area of Building 4. The westernmost of these directly underlay and were aligned congruent with the eastern sides of elements integral to Buildings 4: therefore these features are interpreted as associated with the construction of Building 4, to support the building in this area of potentially marginal ground.

These features are listed below (Table 10, Table 11).

Cut	Fill	Shape	Base	Dimensions (m)	Depth (m)
976	975	Rectangular	Not ex	0.44m x 0.30m	
866	865	Rectangular	Flat	0.38m x 0.29m	0.08m
859	857, 858	Square	Flat	0.22m x 0.19m	0.18m
918	917	Rectangular	Flat	0.26m x 0.18m	0.13m
577	576	Circular	Pointed	0.48m x 0.36m	0.70m
621	620	Square	Flat	0.19m x 0.19m	0.10m
619	618	Rectangular	Flat	0.27m x 0.24m	0.37m
638	637	Circular	Pointed	0.16m x 0.14m	0.15m
640	639	Circular	Concave	0.38m x 0.34m	0.20m
643	642	Circular		0.05m x 0.05m	
647	646	Circular	Concave	0.36m x 0.36m	0.14m
656	655	Circular	Concave	0.50m x 0.35m	0.26m
780	779	Rectangular	Flat	0.36m x 0.30m	0.30m
784	783	Rectangular	Flat	0.16m x 0.13m	0.09m
820	778, 819	Rectangular		0.26m x 0.22m	
920	919	Circular	Flat	0.18m x 0.17m	0.32m
943	944	Ovoid	Flat	0.25m x 0.21m	0.06m

Table 10 Postholes associated with the construction of Building 4, Period 5

Context No	X-section	Conversion	Size
771	Rectangular		45mm x 35mm x 70mm
793			
767	Rectangular	Box quartered	200mm x 120mm
766	Rectangular	Box quartered	80mm x 70mm
762	Rectangular		120mm x 90mm x 140mm
761	Rectangular		100mm x 75mm x 100mm
782	Rectangle		90mm x 60mm
750	Rectangle		180mm x 75mm x 140mm
768	Rectangle	Box quartered	70mm x 40mm
659	Rectangle		100mm x 55mm x 220mm
785	Rectangular		40mm x 20mm
773	Rectangular		70mm x50mm
765	Rectangular		90mm x 50mm x 80mm

Table 11 Driven posts associated with the construction of Building 4, Period 5

4.5.3.2 Surface external to Building 4

Abutting the external face of wall [529] at the northwest corner of Building 4 was sandy silt layer [714] that measured 1.60m east-west, 1.44m north-south and which

was 0.10m thick. A similar layer [604] was recorded immediately to the south of Building 4 abutting wall [528] and here the deposit measured 2.60m east-west, 0.40m north-south and 0.10m thick. Pottery found in [714] dates to 1775-1830 and the clay tobacco pipe dated to 1780-1830, while the pottery from [604] dates to 1825-1900 and the clay tobacco pipe to 1580-1900. The highest level was on [604] at 4.38m OD.

4.5.3.3 Drain to the south of Building 4

Context [597] represented the construction cut for a brick lined drain [593]. The cut, which was 1.10m wide, 1.18m long and 0.16m deep continued south beyond the edge of excavation (Fig 8). The sides of the feature were built in brick placed on edge forming a drain *c* 0.20m wide. The bricks were unfrogged of fabric 3034 and the latest date is 1666-1850. The backfill to the construction cut was a silty clay [596] and pottery from this context is dated to 1825-1900 and the clay tobacco pipe dates to 1580-1900.

At the north end of the drain abutting the south wall of Building 4 was a square brick lined shaft that would have accommodated the down pipe taking run-off water from the building. The fill of the shaft was a sandy silt in which was found a bone handled iron knife sf61).

*4.5.3.4 Cobbled surface and enclosure east of and integral to Building 4 (*c *1850)*

Wall foundations were recorded that enclosed a cobbled surface adjacent and east of Building 4. Context [786] represented the remains of a wall to the north and east of Building 4 and aligned east-west at right angles to the east wall [527] of Building 3. The remains of [786] measured long 1.70m, 0.23m wide 0.15m high which were built with stock moulded bricks of fabric 3032. The latest date for these bricks is 1666-1850.

The rough and ready nature of the floor surface described below suggests that the walls [751] and [786]/[753] may have enclosed a small yard or a lean to structure with an open east side, within which were surfaces described below.

A probable rebuild to wall [786] was masonry context [753], which measured 2.50m long, 0.30m wide and 0.23m high. The bricks used in this build were reused stock moulded and machine made, fabric 3032 and modern 3033. The latest dated brick was 1850-1900.

Abutting the south-east corner of Building 4, and aligned on the same east-west alignment as wall [528], were the remains of the wall [751]. Wall [751], which measured 2.50m long, 0.25m wide, and 0.27m high, was built with fresh and reused stock moulded brick of fabrics 3032nr3033, 3033, and 3035 and the latest dated material was 1780-1850. At the east end of wall [751] was the rectangular post-pit [883] (fill 882], [881]) which may have formed part of the structure. The post-pit measured 0.50m by 0.32m by 0.223m deep. Pottery from [883] dates to 1780-1900.

Between the walls [751] and [786]/[753] a compacted clayey silt deposit [641] which was 0.15m thick had been laid down to form a bedding layer for a brick and cobble surface (contexts [605], [569] and [531]). The bricks used in the surface were stock moulded and frogged (fabric 3032, 3034, and 3035) and the latest dated brick was 1780-1850. The surface covered an area that measured 4.40m north-south by 2.50m east-west. The level on the floor was between 4.38m OD and 4.26m OD.

Pottery recovered from the surface makeup layer [641] is dated 1830-1850 while the clay tobacco pipe dates to 1840-1890. Pottery retrieved from the surface layer [569] dates to 1825-1900 while pottery from the brick and cobbled surface [531] dates to 1800-1900.

A mortar spread [588] overlay part of the floor surface and this may have been a repair to the surface. The highest level was at 4.34m OD.

Partially overlying the brick and cobbled surface [531] was a trample layer of crushed brick, mortar, gravel and silt [530]. The highest level was at 4.37m OD. Pottery recovered from this layer dated to 1800-1830 and the clay tobacco pipe dates to 1780-1830.

Overlying surface [569] and abutting the east wall [527] of Building 4 was a layer of mortar [567] that measured 0.70m north-south and 0.20m east-west. The straight edges of this deposit suggest that it may have been a bedding layer perhaps for a brick step (since removed) and indicate a doorway into Building 3. The highest level was at 4.35m OD. An iron chisel sf <66> was found in mortar layer [567].

A number of the tips to timber stakes as well as a horizontally laid plank [658] were recorded along the eastern margin of the brick and cobble floor. These timber elements do not seem substantial enough to represent a wall line but a fence line is a possibility. The details are tabulated below.

Context No	X-section	Conversion	Setting	Size	OD level
658	Rectangular	Tangentially faced	Horizontal	940mm x 130mm x 60mm	4.13m OD
650	Rectangular	Box quartered	Vertical	60mm x 40mm	4.28m OD
649	Rectangular		Vertical	90mm x 60mm	4.20m OD
648	Rectangular		Vertical	150mm x 130mm	4.24m OD
657			Angled to north	25mm x 25mm	4.17m OD
652	Rectangular		Vertical	90mm x 60mm	4.22m OD
651	Rectangular		Vertical	150mm x 130mm	4.27mm OD

Table 12 Details of timber stakes associated with Building 4, Period 5

4.5.4 Building 5: brick floor and drain (c 1850)

In the north-east corner of Trench 4 context [541] represents the construction cut for a drain that was fed from a shaft to the west and which flowed east, discharging into the stream (Fig 8). The construction cut was 3.80m long, 0.36m wide and 0.22m deep. The cut was characterised by vertical sides falling to a flat base that inclined to the east.

At the west end of the drain was a brick lined square shaft that measured 0.26m square and which fed a ceramic pipe. The ceramic building material report gives the latest dated material is 1850-1950. the drain could have been rebuilt/repaired at the beginning of Period 6 and the ceramic pipe inserted then. The backfill to the construct cut was a sandy silty clay [547]. The down shaft was filled with a sandy silt [582] that was overlain by a loose silty sand with frequent broken brick.

The drain was overlain by two layers separated from each other by a plank of wood [626] laid on edge. The timber was too degraded to survive lifting but it was recorded as at least 2m long 25mm thick. To the east of the plank was a deposit of compacted sandy silt and crushed brick [610], which measured 3.38m north-south and 1.68m east-west. The highest level was at 3.93m OD. Pottery found in this layer is dated 1800-1900. To the west of the plank a layer of sandy silt [611] was recorded

measuring 2.0m north-south and 1.60m east-west. The highest level was at 3.89m OD. Pottery from [611] is dated to 1780-1900.

The two layers [611] and [610] formed the makeup layers for a brick and cobbled floor [538]. The bricks used in the floor were frogged and unfrogged stock bricks (fabric 3032, 3033 and 3035) the latest date for which is 1780-1850. The surviving floor measured 2.0m north-south and 1.60m east-west and the highest level was at 3.95m OD. Pottery recovered from the floor dates to 1800-1830.

To the south of layer [611] and separated from it by a later intrusion cut [552] (see Period 6]) was a layer of sandy silt [631] which was probably the same deposit as layer [611]. Pottery from layer [631] dates to 1770-1900 and the clay tobacco pipe dated to the 19th century. Overlying layer [631] was a brick and cobbled surface [540] built with the same type of bricks that were used in the floor [538]. The highest level on the floor [540] was at 4m OD.

A remnant of the same surface as [538] and [540] was also recorded to the west where it was assigned the context [539]. The highest level on [539] was at 4.08m OD. Pottery recovered from the surface of [539] dated to 1770-1830.

Overall the floor area represented by the contexts [538], [540] and [539] measured 3m square. Although no associated walls or wall foundations were found it is possible that the floor represented the surviving remains of a sunken or semi-basemented structure.

4.5.5 Tumbling Bay Stream (c 1850)

On the east side of Trench 3, truncating the bed of the stream, were two pits [310] and [312] (not illustrated). Cut [310] (fill [311]) was square in plan with vertical sides falling to a flat base. The feature measured 0.96m by 0.92m and was 0.27m deep. The highest level was at 2.02m OD and the lowest at 1.75m OD. The fill was pea grit gravel and clayey silt with fragments of brick. Pottery from [311] dates to 1810–1840.

Cut [312] (fill [313]) measured 2.20m north-south at least 0.70m east-west and 0.40m deep but it continued west beyond the limits of the excavation. The sides of the cut were near vertical falling to a flat base. The fill was a clayey silt with occasional fragments of ceramic building material.

The two features described above may be related to the scouring out of the stream prior to the building of a new revetment.

On the western side of the Tumbling Bay Stream, covering the timber posts that formed a revetment in Period 3 was a sandy silt [376] that may have been deposited when the Period 3 revetment collapsed. The highest level on this deposit was at 3.70m OD. Pottery from [376] is dated 1830-1850 and the clay tobacco pipe dates to 1850-1860. Overlying [376] was a compacted clay [247] that may have been deliberately put down to consolidate the riverbank.

Postholes truncated deposit [247] and these could have formed part of a new revetment along the west bank. Postholes [405] and [399] still retained wooden pile tips [500] and [493]. Timber [500] was sampled (<10>) . A stakehole [417] that truncated deposit [376] may also have formed part of the revetment. Pottery recovered from posthole [399] dated to 1770-1830.

Details of the postholes and the stakehole are given in the table below.

Cut	Fill	Shape	Base	Dimensions (m)	Depth (m)
405	500, 404	Circular	Pointed	0.20m x 0.20m	0.95m
399	493, 398	Circular	Pointed	0.16m x 0.16m	0.80m
401	400	Ovoid	Pointed	0.17m x 0.13m	0.50m
403	402	Circular	Pointed	0.12m x 0.10m	0.27m
397	396	Rectangular	Flat	0.33m x 0.24m	0.22m
417	416	Circular	Pointed	0.08m x 0.08m	0.23m

Table 13 Details of postholes associated with the Tumbling Bay Stream, Period 5

Overlying channel fill [257] (see Period 4) and truncated by the revetment (see Period 6) was a sandy silty gravel [238]. In plan this water-lain deposit measured 5.0m north-south, between 0.60m and 0.90m wide and *c* 0.55m thick. The highest level was at 3.01m OD. Pottery from this deposit is dated to 1850-1900 and the clay tobacco pipe dates to 1820-1830.

4.5.6 External features

4.5.6.1 Sunken barrel, possible well (Trench 1)

In Trench 1 a circular cut [184] truncated layer [200] from Period 4 (Fig 8). The cut had near vertical sides falling to a slightly concave base. The cut which had been truncated from above by modern machining measured 0.90m east-west and was at least 0.94m deep. The level on the bottom of the cut was at 2.57m OD. Cut [184] held a timber barrel [182] 0.57m in diameter and at least 0.50m tall. The backfill to the construction cut was silty sand clay [183]. The sunken barrel was recorded partially in plan and in section 15 (see Fig 12). The depth of the feature suggests that it may have been a well.

4.5.6.2 Postholes and stakeholes (Trench 3) (see Fig 8) (after 1840)

A concentration of postholes and stakeholes was revealed across Trench 3 with a concentration to the east but their significance is not understood (Fig 8). Only in two instances was there any dating material recovered from these features; from posthole [438] came pottery dated to 1770-1840 and clay tobacco pipe dating to 1820-1860 and in post pit [436] were pot sherds dating to 1830-1900 and clay tobacco pipe dating to 1840-1910.

Details of all the postholes and stakeholes excavated in Trench 3 are given in Table 14 below.

Cut	Fill	Shape	Base	Dimensions (m)	Depth (m)
233	232	Square	Pointed	0.10m 0.08m	0.18m
235	234	Square	Pointed	0.12m x 0.12m	0.18m
237	236	Circular	Flat	0.10m x 0.08m	0.18m
319	320	Circular	Pointed	0.15m x 0.15m	0.15m
321	322	Circular	Pointed	0.16m x 0.15m	0.21m
323	324	Circular	Pointed	0.26m x 0.21m	0.20m
325	326	Circular	Pointed	0.23m x 0.21m	0.16m
327	328	Ovoid	Pointed	0.26m x 0.l19m	0.25m
329	330	Circular	Pointed	0.18m x 0.18m	0.20m
367	366	Rectangular	Pointed	0.16m x 0.14m	0.19m
369	368	Rectangular	Flat	0.17m x 0.14m	0.08m
438	437	Square	Pointed	0.22m x 0.22m	0.28m
440	439	Square	Flat	0.18m x 0.18m	0.15m
444	443	Circular	Pointed	0.17m x 0.14m	0.13m
446	445	Square	Pointed	0.13m x 0.12m	0.28m
448	447	Irregular	Uneven	0.38m x 0.28m	0.13m
450	449	Ovoid	Pointed	0.28m x 0.20m	0.09m
452	451	Circular	Rounded	0.10m x 0.07m	0.10m
454	453	Circular	Rounded	0.10m x 10.0m	0.10m
456	455	Circular	Rounded	0.06m x 0.05m	0.05m
460	459	Circular	Pointed	0.12m x 0.10m	0.10m
463	462	Square	Pointed	0.12m x 0.10m	0.18m
465	464	Ovoid	Pointed	0.14m x 0.10m	0.21m
467	466	Rectangular	Pointed	0.14m x 0.08m	0.20m
469	468	Rectangular	Pointed	0.09m x 0.08m	0.18m
471	470	Circular	Pointed	0.13m x 0.12m	0.25m
477	476	Circular	Pointed	0.10m x 0.07m	0.13m
479	478	Square	Flat	0.16m x 0.10m	0.10m
430	429	Ovoid	Pointed	0.20m x 0.18m	0.11m
432	431	Circular	Pointed	0.20m x 0.20m	0.17m
434	433	Circular	Flat	0.34m x 0.32m	0.10m
436	435	Square	Flat	0.51m x 0.49m	0.13m
409	408	Circular	Pointed	0.08m x 0.08m	0.10m
411	410	Circular	Pointed	0.09m x 0.09m	0.18m
413	412	Circular	Pointed	0.06m x 0.06m	0.09m
415	414	Circular	Pointed	0.06m x 0.06m	0.10m
419	418	Rectangular	Pointed	0.10m x 0.04m	0.09m
422	421	Rectangular	Pointed	0.12m x 0.09m	0.20m
424	423	Square	Flat	0.20m x 0.19m	0.10m
426	425	Circular	Pointed	0.07m x 0.05m	0.10m
428	427	Square	Flat	0.26m x 0.22m	0.08m

Table 14 Details of postholes in Trench 3, Period 5

4.5.6.3 External Surface (Trench 3) (after 1830)

At the west end of Trench 3 was a layer of compacted orange brown gravel [250] encountered between 4.35m OD and 4.24m OD. This layer measured 7.20m east-west and 5.0m north-south and continued beyond the area of excavation to the north and south. This gravel may be a metalled surface or road as a similar surface was recorded in Trench 4, which may be a continuation of layer [250].

On the western margin of [250] aligned north-south was a shallow gully [246] 0.36m wide and 0.07m deep. To the east of the gully was a gravely silt [243] that covered the rest of the trench. The pottery recovered from [243] is dated to 1830-1900.

*4.5.6.4 Ditches and cuts (Trench 4) (*c *1780-1830)*

In Trench 4 a number of features, contexts [880], [848] and [629] (not illustrated) were recorded that must have originated at the beginning of Period 5 but their purpose is uncertain.

Context [880] represented an east-west aligned rectangular cut that measured 1.66m long, 0.30m wide and 0.17m deep. The cut was characterised by vertical sides falling to a flat base. The fill was a mix of broken brick, mortar and a clayey silt [879]. Pottery recovered from the fill has been dated to 1780-1900.

Feature [880] was truncated from above by another linear east-west orientated trench [848] (fill [847]). The rectangular cut [848] measured 6m long, 0.87m wide and was 0.37m deep with vertical sides falling to a flat base. The fill was a clay mixed with silt and crushed mortar with frequent fragments of ceramic building material. Pot sherds found in the fill date to 1780-1830. It may be that the two features described above relate to the same event.

Truncating surface layer [644] was small sub-rectangular pit [629] (fill [628]) with sloping sides falling to a concave base. The cut measured 0.80m north-south, 0.55m east-west and was 0.12m deep. The fill was a sandy silt from which pottery was recovered that dated to 1550-1900. The function of the pit is uncertain.

To the east of pit [629] truncating gravel layer [537] was a north-south aligned drainage ditch [536] (fill [533]) (not illustrated). The ditch was 4.90m long, 1.10m wide and 0.25m deep. The cut was characterised by sloping sides falling to a concave base that inclined to the south. The fill was a silty clay from which pottery dating to 1800-1830 was retrieved and clay tobacco pipe that dates to 1780-1830. The ditch appears to have remained open until Building 4 was constructed.

*4.5.6.5 Sunken barrel features (Trench 4) (*c *1770-1830)*

In the central part of Trench 4 were of four sunken wooden barrels set within circular pits characterised by vertical sides falling to a flat base (Fig 8). The barrels were arranged on an east-west alignment over a distance of 4.50m.

Context [242] represented a circular cut that measured 0.67m in diameter and 0.12m deep. The highest level was at 3.91m OD and the lowest at 3.79m OD. Degraded timber [241] formed the base of a barrel and context [249] represented the sides of the barrel that had been placed within the pit [242]. The barrel was 0.58m in diameter and the level on the base was at 3.88m OD. The space between the barrel and the sides of the cut was backfilled with sandy silt [248]. It is thought that the barrel(s) would have been filled in when they were no longer in use and these deposits are further described and discussed in Period 6.

Adjacent to barrel [249] was cut [278] that measured 0.88m in diameter and was 0.29m deep. The level on the bottom of the cut was at 3.59m OD. Context [277] represented the barrel, which measured 0.67m in diameter.

A third pit, 0.60m to the east of barrel [277] was cut [256] which measured 0.99m in diameter and 0.39m deep. The level on the base of this cut was at 3.43m OD. Context [255] represented the barrel 0.79m in diameter and the level on the base of the barrel was at 3.45m OD. The backfill to the construction cut was a gravely silty clay [254] in which pottery was found dating to 1770-1830 and clay tobacco pipe dated 1580-1910.

A fourth sunken barrel was located 0.50m further to the east. The cut [692] measured 0.78m in diameter was 0.17m deep and the level on the bottom of the cut was at 3.52m OD. An iron hoop 0.74m in diameter was all that remained of the barrel. The backfill to the construction cut was a clayey silt [690].

4.5.6.6 Post-built structure (Trench 4) (after 1840)

Possible post-pits were recorded that may form a rectangular structure to the south and west of barrel [249]. The cuts were characterised by vertical or near vertical sides falling to a flat base. Although in the case of [299] the base sloped noticeably to the west. Posthole [339] was notable for a degraded wood fill [338] that represented the remains of the post. Pottery found in post-pit [299] dated to 1770-1830 and 19th century pottery was found in the post-pits [304], [339] and [337].

Two postholes set 1.20m apart (north-south) and thought to be linked were recorded 2.50m north of the line of sunken barrels but these features were truncated and further interpretation is difficult. From posthole [579] came pottery dating to 1800-1820 and in posthole [607] pot was found dating to 1840-1870 and clay tobacco pipe dated 1840-1860.

Details of the post-pits are given in Table 15 below:

Cut	Fill	Shape	Base	Dimensions (m)	Depth (m)
299	298	Square	Sloping	0.60m x 0.60m	0.20m
304	303	Square	Flat	0.28m x 0.28m	0.17m
371	370	Rectangular	Flat	0.62m x 0.46m	0.24m
339	338, 356	Rectangular	Flat	0.40m x 0.38m	0.22m
337	336	Rectangular	Flat	0.44m x 0.41m	0.14m
579	578	Square	Concave	0.44m x 0.44m	0.54m
607	606	Rectangular	Concave	0.48m x 0.44m	0.46m

Table 15 Details of post-pits in Trench 4, Period 5

4.6 Period 6 (after 1850)

Period 6 represents activity and remains dated to the second half of the 19th century:

- The revetment for the Tumbling Bay Stream is rebuilt with the construction of a substantial riverside timber wall. On the landward side this revetment is fixed with iron rod tie-backs buried under ground and anchored to timbers set parallel to the revetment.
- Buildings 4 and 5 were demolished and the ground level was raised by *c* 0.45m across the site and a new north-south cobbled road laid out across the site. This continued north and south, beyond the limits of the excavation.
- The cottages (Building 3), from Period 5, were retained and supplied with gas.
- A new pavement with a granite stone curb was put down and a new metalled surface was laid down between the pavement and the road. A soakaway was sunk in the south-west corner of the site.

See Fig 9.

4.6.1 Building 3: terraced cottages

The Cottages recorded in Period 5 were retained and altered. See Fig 9.

In some cases the threshold to the entrances to cottages had to be rebuilt. Context [36] represented a slab of concrete at the entrance to cottage No. 1. The slab measured 0.90m by 0.20m by 0.06m thick. The level on the slab was at 4.59m OD. Context [25] represented a concrete slab at the entrance to cottage No 4. The slab measured 0.78m by 0.60m by 0.04m thick. The level on the slab was at 4.57m OD.

A layer of brick rubble [32] recorded on the western margins of the site inside the walls of the cottages represented the demolition of the buildings at the end of Period 6.

4.6.1.1 Addition of gas supply

Lead pipes (not illustrated) that probably supplied gas to the cottages were exposed along side the frontage of the terrace. Adjacent to Nos 2 and 3 truncating the brick drain [204] (see Period 5) was the partially excavated cut [148]. The cut was at least 5m long (it continued both to the north and south beyond the area of excavation). It was 0.36m wide and 0.24m deep ran parallel to the front of the cottages and had a branch that ran to the individual cottage. The cut held a (now disused) lead gas pipe [149]. Sandy gravel [144] overlain by silty sand [145] backfilled the cut. A Victorian penny sf<3> was found in the fill [144]. Further to the south at No 5 context [139] represented the construction cut of the gas pipe that led to cottage and context [138] represented the backfill. Pot sherds retrieved from the fill [138] date to 1770-1840.

4.6.1.2 Disuse of cottage drains (c 1862)

The brick drains, which ran east from the cottages presumably to discharge into the Tumbling Bay Stream, probably went out of use when the channel was reveted in Period 6.

Sandy silts filled the drains and a Victorian halfpenny dated to 1862 sf <5> was found in the fill of drain [204] which is an indication that the drains were in use until at least this date.

From fill [514] of drain [507] came pottery dating to 1840-1900 and clay tobacco pipe dating to 1580-1910. The fill also produced a number of small finds that included a jet bead sf <10>, copper-alloy fittings including a small wire dress hook and paper fastener sf <11>, as well as 49 copper alloy pins sf <12>, a bone disc sf <13>, a slate pencil sf <14>, a copper-alloy oval locket frame sf<16>, a small pewter/tin container sf <51>, and several pieces of textile including a strip of silk with a stitched edge.

Context [532] represented the fill of drain [508] and pottery from this fill has been dated to 1830-1900 and the clay tobacco pipe dates to 1580-1910. A glass bead sf <17> was also found in this fill. Nineteen copper-alloy pins sf <52> and a wire dress hook sf <53> almost certainly have been wrongly attributed to context [521] the backfill to construction cut [510] and almost certainly derive from fill [532] of drain [508].

The fill [532] was truncated by cut [544] (fill [545]) (not illustrated) which appears to represent robbing activity of the drain itself. The cut [544] measured 2.28m east-west, 0.92m north-south and was 0.28m deep it had sloping sides falling to a flat base. The

fill was a sandy silty clay, which produced pottery dating to 1800-1900, and 19th century clay tobacco pipe.

4.6.1.3 Pavement

East of the cottages, covering the gas pipes, was a pavement (Fig 9). The construction cut [128]/[133] contained a bedding/levelling layer of sandy mortar [291] overlain by a silty sand [290] on top of which granite kerb stones [131] were set. The kerb stones measured 1.33-1.52m long x 0.46m by 0.30m. The level on the kerb was 4.75m OD at the north end and 4.64m OD at the south end. To the east of the kerb an edging formed by a single coarse of granite cobbles [117] was laid and then a bedding layer of sand [26]/[126] on which stone paving slabs [8] were set. The pavement ran the length of the terrace and was 22.30m long and 1.95m wide. The level on the pavement was at 4.58m OD on the north side and 4.55m OD on the south. Pottery found in the bedding layer [26] dates to 1825-1900+ and the clay tobacco pipe to 1820-1860.

4.6.2 Tumbling Bay Stream: new revetment (after 1850)

Context [212] represented the riverbank behind the timber revetment [81] (Fig 9). The feature was partially recorded in plan and in section 39 (see Fig 14). The bank sloped from a highest level at 3.99m OD to the lowest level at 3.25m OD over a distance of 3.40m.

In the north-facing section 36 (see Fig 14) the cut of the riverbank behind the revetment [81] was recorded as context [874] (the lowest level was at 2.34m OD).

In the central part of the site cut [609] (see Fig 9) represented the partially exposed stream bank edge behind the timber revetment [81]. Filling in behind the revetment was a clayey silty gravel [608]. Pottery recovered from deposit [608] dated to 1850-1900.

In the south-east corner of the site cut [82] (see Fig 10) represented the riverbank behind the revetment [33]. Here the edge of the channel was characterised by a sloping side (gradient of 5:2) that fell 0.96m over a distance of 2.55m from 3.72m OD to 2.76m OD.

The timbers [81]/[33], which formed the revetment, were planks of wood at least 1.34m long, 0.27m wide and 0.13m thick, set vertically into the ground. A sample (<5>) of wood was taken . The highest level on the revetment was at 4.64m OD. On the south side of the trench the revetment was represented by context [33] where a horizontal plank on the riverside of the revetment was fixed by the iron tie-backs.

In section 39 (see Fig 14) a sandy silty gravel [202] overlain by a sandy gravel [213] filled the channel behind the revetment. Pottery recovered from the deposit [202] is dated to 1850-1900+. In section 36 the fill behind the revetment was noted as context [873].

Recorded in plan, in the northern part of the site overlying contexts [213] and [873] dumped material behind the revetment on the land ward side was identified in plan as a sand silt clay [78]. The highest level was at 4.03m OD.

On the south side of the site backfilling behind the revetment ie on the landward side comprised a sequence of silty sandy gravels [89] and [43] capped by clay [42].

Pottery retrieved from [43] dates to 1830-1870 and the clay tobacco pipe dated to 1840-1910.

Unearthed in Trench 3 were iron rod tiebacks that were secured on the landward side to a timber anchor laid horizontally and parallel with the revetment. The rods and the timber 'anchor were set in a T-shaped cut [266]/[263] not fully excavated, 0.50m wide and 0.47m deep. The timber anchor [316] was at least 3.16m long 229mm wide and 119mm thick. Here the iron rods [317] and [318] were *c* 5.0m long and had a diameter 31mm passed through the timber with a nut on the land ward side. The iron rods had a bolt head at the east end which passed through a metal plate and was then followed by the timber revetment, next the timber anchor, then another metal plate before being secured by a nut. The level on the rods was at *c* 4.08m OD. The tie-back rods were set about 2.20m apart. A clayey silt with crushed ceramic building material [262] and [265] backfilled the construction cut. Pottery found in [262] is dated to 1800-1900. The pottery from [265] dates to 1810-1900 and the clay tobacco pipe to 1580-1910.

Further timber anchors were exposed (see Fig 9) elsewhere on the site. Sited 2m to the south of [266]/[263] was context [552] which represented the construction cut that held timber [551] anchor that secured two iron rod tiebacks [548] and [549]. The timber [551] measured 3.50m long by 120mm wide and 200mm high. The two iron rods were 4.92m long and 32mm in diameter. The backfill behind the timber anchor was a sandy silt [575], which produced pottery dating to 1830-1900, and clay tobacco pipe dated to 1850-1860. From the upper fill of sandy clay silt [550] came pot sherds dating to 1800-1900 and clay tobacco pipe dated to 1820-1860.

Sited 4.50m further to the south cut [744] was only partially exposed and excavated. It measured at least 3.50m m long, and 0.44m wide and held the timber anchor [743]. The backfill was a clay silt [742], which produced some residual pottery dating to 1680-1740.

At the south end of the site context [824] represented the construction cut that held wooden anchor [825]. As recorded in plan the construction cut measured 3.60m north-south, was 0.50m wide and held a horizontally positioned timber 3.10m long and 140mm wide. The backfill was a sandy silt [823].

4.6.3 Demolition of Buildings 4 and 5 (after 1850)

A dump of broken brick and mortar [526] in the south-east corner of Building 4 probably resulted from the demolition of the building. Immediately to the south of Building 4 a dump of mortar [561] which measured 4.96m east-west, 1.32m north-south and *c* 30m thick was also probably part of the same demolition sequence. The highest level was at 4.50m OD. Pottery from this mortar layer dates to 1830-1900 and the clay tobacco pipe dated to 1820-1860.

The cobble surface [531] (see Period 5) associated with Building 4 was truncated by an irregular shaped cut [601]. The cut, which measured 0.90m east-west, 0.46m north-south and was 0.20m deep, had vertical sides falling to a base that sloped to the east. The lower fill was a sandy silt [600] 0.07m thick covered by an upper fill of brick packing [595]. In the lower fill was pottery dated to 1850-1900 and a Victorian penny sf <18>.

Building 5 was also demolished at this time and the dumped deposits [535], [534] and [546] which overlay robber cut [544] and part of the floor of Building 5 were probably deposited during the destruction of the building. The basal layer [535] in the sequence was a spread of crushed brick. This deposit was sampled (<19>) for further environmental analysis. Covering [535] was a layer of coarse sand and gravel [534] with frequent fragments of ceramic building material and metal slag. This deposit was also sampled (<17>). A third layer of sandy silt [546] with inclusions of coal and brick fragments covered [534] and was sampled (<18>). Pottery from deposit [546] dated to 1840-1900.

4.6.4 Infilling of sunken barrels (after 1850)

The sunken barrel which may have been a well recorded in Trench 1 was filled in. The bottom fill of the well was sandy silty clay [181] which was 0.20m thick and was sampled (<1>) for further environmental analysis and yielded a fairly large number of seeds, albeit mostly from elder, and some snails. Pottery found in [181] is dated to 1820-1900 and the clay tobacco pipe dates to 1580-1910. A secondary fill of clay [180] 0.22m thick, covered [181]. Pottery from [180] dates to 1780-1900 and the clay tobacco pipe dated to 1680-1810. A final layer of loose sandy silt [179], 0.26m thick filled the barrel and pottery from this deposit dated to 1830-1900 and the clay tobacco pipe dated to 1580-1900.

The sunken barrels unearthed in Trench 4 were also deliberately filled in at the beginning of Period 6. Context [24] represented the silty sand fill of barrel [241] and pottery found in this deposit dated to 1850-1900. A sequence of silty sandy clays [276], [505] and [504] filled the barrel [277]. From deposit [505] came only residual pottery dated 1630-1680 and clay tobacco pipe dating to 1680-1710 but in the basal deposit [276] pottery was found dating to 1850-1900 and clay tobacco pipe 1580-1910. Filling barrel [255] was a lower fill of gravel and silt [253] overlain by an upper fill of gravel [252]. In [253] was pottery dating to 1850-1900 and clay tobacco pipe dated 1580-1910.

4.6.5 Cobbled road

During this phase the level of the ground was raised by *c* 0.50m across the site and a 3.80m wide cobbled road [65] was laid down parallel to the Tumbling Bay Stream (Fig 9).

The road was at least 35m long and continued beyond the limits of the excavation both to the north and south. At the north end the highest level on the road at the top of the camber was at 4.87m OD with the level dropping off to 4.82m OD to the west and 4.79m OD to the east. At the south end of the road the level at the top of the camber was at 4.78m OD and it dropped off to the west to 4.74m OD and to the east to 4.73m OD.

Along the southern half of the road the granite-cobbled sets, which measured 260-80mm x 160-80mm were laid out in east-west aligned rows, on to a bed of grey mortar [258]. In the northern part of the road larger granite stones were used (550-280mm x 400-280mm) to form two north-south rows approximately a 0.50m –1m wide and set a 1.20m apart. These larger stones may have been to smooth the way for wheeled transport.

At the south end of the road on its eastern edge were two square postholes that truncated the cobbles [2]. Cut [91] with (fill [90]) measured 0.22m by 0.22m and was 0.18m deep. It had vertical sides falling to a flat base. The fill was a sandy silt. A similar posthole [100] (fill [101]) was sited 3.20m to the north of posthole [91]. From both postholes came pottery that dated to 1780-1900. It is uncertain as to why posts would have been placed here, but there are many possible reasons.

4.6.6 External metalled surface and associated features (after 1820)

West of the cobbled road – between it and the Period 6 pavement that was external to the cottages – was a 6.50m wide metalled surface [2] (Fig 9). The highest level on [2] was at 4.75m OD.

On the south-west side of the excavation the surface was more patchy and partially overlying metalled surface [2] was a spread of mixed silt gravel and tar [6] that measured 9.0m north-south by 6.40m east-west. The highest level was at 4.75m OD.

Also in the south-west sector of the excavations, abutting layer [6], context [5] was a brick surface that measured 3.72m north-south and 5.29m east-west. The bricks used were unfrogged, measured 227mm x 110mm 70-80mm and were in a yellow and orange fabric. The highest level on the brick surface was at 4.88m OD.

Compacted gravel and silt contexts [3] and [4] formed the surface that measured 7.0m east-west by 4.30m north-south in the south-west corner of the site. Partially overlying context [3] was a spread of tar [1]. The level on the tar surface was at 4.76m OD.

On the south-west side of the excavations, set into the ground surface, was a soakaway [461] formed by a vertically set ceramic drain encased in concrete with a grated cast iron cover.

There were 12 postholes recorded which truncated metalled surface [2]. Postholes [107], [112], [98], [110], [142], [152], [147], and [124] set between 4.0m and 1.50m apart, aligned north-south and spread out over 19m. The postholes may have formed a fence line. Located 2.50m to the east of this line was a second parallel line of postholes [104], [102, [115], and [120], and spaced between 7.20m and 4.20m apart, over a distance of 17m. Posthole [124] was notable for the wooden post tip [125] that still survived in situ. In posthole [115] pottery was found dating to 1800+, from posthole [147] pot dating to 1670-1930 and in posthole [142] pot dating to 1820-1900+ was found.

Details of the postholes are given in Table 16 (below).

Cut	Fill	Shape	Base	Dimensions (m)	Depth (m)
115	114	Circular	Pointed	0.36m x 0.30m	0.23m
147	146	Circular	Concave	0.50m x 0.48m	0.23m
112	111	Rectangular	Flat	0.42m x 0.40m	0.33m
107	106	Ovoid	Pointed	0.30m x 0.22m	0.11m
104	103	Circular	Pointed	0.24m x 0.20m	0.13m
102	101	Circular	Concave	0.32m x 0.32m	0.21m
98	97	Circular	Concave	0.32m x 0.32m	0.18m
120	119	Circular	Pointed	0.34m x 0.32m	0.25m
124	123, 125	Ovoid	Flat	0.60m x 0.44m	0.23m
142	141	Rectangular	Concave	0.68m x 0.58m	0.22m
152	151	Rectangular	Concave	0.45m x 0.44m	0.25m

Table 16 Details of the postholes cut into the external metalled surface, Period 6

4.6.7 Infill of the Tumbling Bay Stream (after c *1884)*

The basal (Period 6) fill within the riveted channel was a clayey silt [215] (see section 22, Fig 12). The deposit was 4.0m wide and 0.30m thick. The highest level was at 3.59m OD and the lowest at 2.72m OD. Pottery found in this deposit dates to 1840-1900 and the clay tobacco pipe dated 1850-1900.

Covering [215] and filling the channel comprised a sequence of silty clays [215], [79], [391], [94] and [105]). Pot sherds dating to 1928+ and clay tobacco pipe dated 1850-1880 were retrieved from context [79], and context [94] produced pot dated to 1884+ and clay tobacco pipe dating to 1850-1880. Pottery from [105] was dated 1916+ and the clay tobacco pipe to 1820-1860. The highest level on these layers was on [94] at 3.87m OD.

Context [95] represented a layer of brick rubble that appeared to have been deliberately laid down to consolidate the east bank of the stream. Truncating the layer [95] was a corrugated iron sheet [390] which was used to form an ad hoc revetment for the eastern bank. The level on the corrugated iron was at 3.50m OD.

Contexts [118] and [140] represented dumps of compacted silty clays up against the corrugated revetment on the landward side. Pottery recovered from layer [140] dated to 1830-1940. Layer [140] was partially overlain by a dump of clayey silt and brick rubble [113]. The highest level on [113] was at 3.56m OD

On the south side of the excavations context [55] represented the black silt fill of the channel. The highest level was at 3.85m OD. Pottery recovered from this deposit dates to 1907+. Also found in this deposit were whole glass bottles and an enamelled metal mug sf <26>.

5 Quantification and assessment

5.1 Post-excavation review

In order to produce this report, a statement of the potential of the stratigraphic archive was produced (section 6). An assessment has been made (section 6.1) of the degree of realisation of the original research aims and of the research potential generated by this. Recommendations have made (section 8), along with a chronological and contextual framework for the quantification and assessment of the finds and environmental data sets (section 9).

5.2 The site archive and assessment: stratigraphic

Tasks completed to date:

- site matrix checked on Excel
- all 1:20 plans of cut features are digitised.
- photographs indexed.
- all environmental material processed and assessed
- all finds processed and assessed
- provisional dating for all phases represented by the excavation is complete

Type	Description	Quantity	Notes
Contexts	Excavation	1085	
Plans	'A4' 1:20 (no. of sheets)	435	
Sections	'A4'	51	
Matrices		Yes	Digital and paper copies
Photographs	Colour slide B/W print Medium format Colour B/W Digital	402 388 15 15 277	

Table 17 Stratigraphic archive

5.3 Site archive and assessment : finds and environmental

This section registers the complete artefactual and soil sample record.

Building material	229 fragments.
Post Roman pottery	1459 sherds Medieval & Post-medieval.
Glass	516 fragments.
Leather	2 pieces.
Accessioned finds	200 objects.
Clay pipes	959 fragments.
Bulk Soil Samples	53
Animal Bone	205 fragments.
Slag	41 fragments; 14.2 Kg.

Table 18 Finds and environmental archive, general summary

5.4 Post-Roman pottery

Chris Jarrett

5.4.1 Introduction

A small-sized assemblage of pottery was recovered from the site (10 boxes). Pottery was recovered from 143 contexts and individual deposits produced small to medium sized groups of material (under 30 or up to 100 sherds) and one large group of pottery (context [644]) with over 100 sherds. This pottery mostly dates to the post-medieval period (1480-1900) and particularly the 17th to 19th centuries, but a small component is medieval in date.

See Appendix 2: pottery for listings.

The majority of the sherds show little evidence of abrasion and were probably deposited fairly rapidly after breakage. The fragmentation of the pottery ranges from sherd material to identifiable forms and a small number of vessels have complete profiles or are intact.

All the pottery (1459 sherds of which eleven are unstratified) was examined macroscopically and microscopically using a binocular microscope (x20), and entered in a database, by fabric, form, decoration, sherd count and estimated number of vessels. The classification of the pottery types follows the Museum of London Archaeology Service system of classification. The pottery is discussed by types and its distribution.

5.4.2 The pottery types

5.4.2.1 Medieval

Medieval pottery is represented by eight sherds amongst the assemblage and the majority of this pottery comprises local coarse wares. Essex early medieval sandy ware (EMSX, dated 1000-1200, is represented by a single sherd. There are two sherds of Essex early medieval ware with fossil shell (Essex fabric 12a), dated 1000-1225 and a single sherd of Essex miscellaneous sandy orange ware (Essex fabric 21), dated 1200-1500. The latter sherd is interesting as it has been modified with rounded corners to form a tool and to the authors knowledge an example of such a sherd has been found on a pottery production center in Buckinghamshire, but there is no other evidence on the Temple Mills site to suggest such activity there. A single, thick walled sherd is present in reduced coarse ware (Essex fabric 20) (RCWX), dated 1175-1400). Forms could not be identified in these wares. Surrey whitewares are represented by two sherds, firstly in Kingston type ware (KING), dated 1230-1400 and by a jug sherd in Cheam ware (CHEA,) dated 1350-1500.

5.4.2.2 Post-medieval

A total of 1449 sherds of post-medieval pottery is present dating from the 16th to 19th/20th century, the latter being in the majority.

Surrey-Hampshire border wares account for 41 sherds of pottery and are as the whiteware, dated 1550-1700 (15 sherds) and is either green, olive or yellow-glazed (BORDG, BORDO and BORDY). The forms present include a handled carinated bowl (BORDG), a dish (BORDO) and chamber pot (BORDY). The redware from this source (RBOR) comprises 25 sherds and is dated 1550-1900.This ware is represented by rounded bowls, dishes and rounded jars. A single bowl sherd needs further research and may come from Verwood, Hampshire or the Surrey-Hampshire borders.

Coarse red earthenwares from the London area accounts for 134 sherds. The earliest of these wares (PMRE), dated 1480-1600 occurs with a single sherd in the form of a jar, whilst a slip decorated sherd (PMSL) of the same date is also present. There are two sherds of slipped redware, dated 1480-1650 and one is green-glazed (PMSRG). The other is clear or yellow glazed (PMSRY) and it is in the form of a bowl or dish. The later coarse redware (PMR), dated 1580-1900 is recorded with 160 sherds and is present in the form of bowls, a cauldron, a colander, flower pots, jars, a lid and a pipkin. There is also a rim sherd possibly from an oversized beaker shaped vessel, which may have been used as a container for a semi-solid substance, but its true function is not yet identified although there may be a connection with printing ink associated with cloth manufacture.

London delftware (TGW) is represented by 69 sherds and was recovered in a number of decorative styles. In style A (TGW A), dated 1612-50 is present with two sherds and in the forms of an albarello and charger. Plain whitewares (TGW C), 1630-1846 with nineteen sherds in the forms of a rounded bowl, chamber pot, jar and rounded mug, while the plain blue wares (TGW BLUE) of the same date range were found with fourteen sherds and were identified in the form of ointment pots. The mid 17th-century polychrome wares (TGW D) are represented by two sherds and comprise a dish. There are also single sherds of the 'china men in grasses' in the form of a dish and Persian blue ware (TGW M), which are dated to 1670-1690 and 1690-1710 respectively. Nineteen sherds are present with blue on light blue designs (TGW H), dated 1680-1800 and these are in the form of an albarello and plates, while there are nine sherds that can only be placed under the generic delftware code: TGW and forms include a tea bowl and wall tile.

The Essex fine red earthenwares, dated 1580-1700 account for 38 sherds of the assemblage, of which eight sherds are black glazed (PMBL) and can not be identified confidently to form, seven sherds are clear-glazed (PMFR) and these are represented by a bowl and a flared dish. There is a single sherd of a brown-glazed (PMFRB) rounded mug and 21 sherds of green-glazed (PMFRG) in the form of rounded jars, some of which are handled.

There are 147 sherds of British stonewares. London stoneware (LONS) is dated to 1670-1930 is present with 27 sherds and occurs in the form of a blacking paste pot, ginger beer and ink bottles, a bowl, shouldered jars, a jug and tankards. The four sherds of Staffordshire brown stoneware (STBRS), dated to 1690-1730 solely comprise tankards, whilst Nottingham stoneware (NOTS), to dated 1700-1800 is found as five sherds and includes a lid. The visually similar Derbyshire stoneware (DERBS) is represented by seven sherds and is found in the form of a flared bowl and jar. A single sherd from a glazed red stoneware (RESTG), dates to 1760-80 and is present in the form of a lid. Bowls, a toy lid, plates, a tankard, tea bowl and a teapot occur amongst the 34 sherds of white salt-glazed stonewares (SWSG), dated to 1720-

80, while the decorated version of the latter has cobalt based decoration (SWSG COB) and is found on a single sherd from a tankard, while the scratch blue ware (SWSG SCRB) is represented by eleven sherds from an unknown form, but both wares are dated to 1740-80.

Generic English stoneware (ENGS) is dated to 1700-1900. It is found mostly in 19th century forms: blacking, cylindrical, ginger beer and ink bottles, besides a bowl and with a total of 32 sherds. Bristol-glazed stoneware (ENGS BRST) is dated 1830-1900 onwards and is present with 40 sherds and often in the same bottle shapes as ENGS, but additionally there are wide mouthed and upright versions. Cylindrical and shouldered jars found were in ENGS BRST and include a milk jug and a cylindrical mug. Black Basalt wares (BBAS), 1770-1900 are represented by a total of eleven sherds, but six are glazed (BBASG) and these are dated 1770-1880, but the forms are typically as tea wares: teapots and their lids. A tea pot lid in blue stoneware (BLUE) is dated to 1800-1900.

The dominant ware type in the assemblage comprises industrial finewares, with a total of 800 sherds and they can be classified as follows. Creamwares account for 97 sherds and these mostly are the plain Developed type (CREA DEV), dated to 1760-1830, but there are single sherds of decorated types: green-glazed (CREA GRN), marbled slipware (CREA MARB) and over-glaze transfer printed ware (CREA OTR) besides a slipware (CREA SLIP). Pearl wares (PEAR), dated 1770-1840 are represented by a total of 122 sherds and decorated examples in blue and white (PEAR BW), polychrome painted (PEAR PNTD), sometimes in earth colours (PEAR ERTH) as well as slip decoration (PEAR SLIP) are found, but often this ware is transfer-printed (PEAR TR). Transfer-printed whiteware (TPW, 1780-1900) comprises a total of 323 sherds and its variants (black and brown prints (TPW3), dated 1810-1900 and flow blue: (TPW FLOW), dated 1840-1900). There is also present plain refined white earthenware (REFW), dated 1805-1900 as a total of 240 sherds, some of which has additional sponge decoration (REFW SPON, REFW SPON1, dated 1830-1900). Smaller amounts of other industrial finewares comprise a lustre decorated red earthenware (LUST) and English majolica (MAJO), dated 1850-1900. Eight sherds are burnt to such an extent that they can be recognised as industrial finewares but can not be further sorted to type. Forms in these consist of, bowls, chamber pots, dishes, jars, jugs, plates (dinner, meat and soup types), saucers, tea bowls, teacups, tureens and vases, while more unusual items are represented by a possible ashtray, door knobs, electrical fuse guards, an electrical lamp socket and a toilet chain pull.

Non-local wares comprise 67 sherds and the earliest of these are combed slipwares (STSL), dated to 1660-1870 and there are six sherds in the form of cups and dishes. There are three sherds of a red earthenware with a speckled glaze in the form of a bowl. This ware has to date not been found in London, except for the north-east boroughs as well as East Anglia. It has been given the Passmore Edwards/Newham Museum Archaeological Services code SPEC and is dated 1680-1740. All the other non-local wares mostly date to the 19th century. Bowls are the only form in the eight sherds of Sunderland coarse ware (SUND), dated to 1800-1900, and this is the only shape present in the earlier variant of this fabric with a brown mottled glaze (SUND MOT), dated to *c* 1775-1850 and comprises a single sherd. Yellow ware (YELL) and its slip-decorated version (YELL SLIP), dated 1820-1900 is present with 32 sherds and is in the form of bowls, dishes and a jug. A single baking dish sherd occurs in

post-medieval slipped redware (PMR SLIP). Rockingham-type ware (ROCK) is present in the form of a bowl, teapot and a teapot lid and occurs with five sherds.

Imported pottery accounts for 45 sherds of which 30 sherds are Chinese porcelain, decorated in either blue and white (CHPO BW), dated to 1580-1900, Batavian style porcelain (CHPO BATV), dated 1700-50, and the Imari style (CHPO IMARI), dated to 1680-1900. These are found in the forms of a bowl, plates, saucers and a tea bowl. There is also a single sherd of Japanese porcelain (JAPO) represented by a 19th 20thntury saucer. The Continental porcelains (CONP), as a total of eight sherds, all dating to the 19th century. These occur in the form of a mug, plate and saucer, but there are also a number of leisure items comprising a figurine, a toy cup and jug and a doll. German stonewares are present with two sherds from Frechen (FREC). These are jugs, dated 1550-1700, and there are also four sherds from the Westerwald (WEST) represented by a flat-rimmed chamber pot (WEST CHP2), dated to 1740-60 and two 19th-century seltzer bottles.

English porcelains account for 80 sherds and include the hard paste type (ENPO HP), dated 1780-1900, as well as over or under-glazed transfer-printed (ENPO OTR, ENPO UTR) or painted in enamels (ENPO PNTD). Forms are mostly represented by tea wares: saucers, tea cups of various shapes and a teapot, besides a candlestick, a condiment, a doll, eggcups, figurines and ornaments and vases.

5.4.3 Distribution

Appendix 2: pottery shows the contexts containing pottery, the number of sherds, the date range of the pottery types in the deposit and a spot date for the group. Pottery occurs in Periods 2–6 and is discussed accordingly.

5.4.3.1 Period 2

There are a total of five sherds of pottery from period 2 and there are three sherds of Essex medieval pottery: Essex early medieval ware with fossil shell (EMSHX/Essex fabric 12a), early medieval coarse sand-and-shell-tempered ware (EMSSX/Essex fabric 12C?) and Essex misc sandy orange ware (SOWX/Essex fabric 21). There are two sherds of post-medieval pottery these are the London area coarse redware (PMR) in the form of a flower pot and Surrey-Hampshire border whiteware with yellow glaze. Pottery mostly derives from alluvial layers, except the PMR flower pot, which came from a fill of channel [844] and the medieval sandy orange ware which was found in fill [910] of cut [911], another possible channel.

5.4.3.2 Period 3

Of the 110 sherds of pottery in this phase, 53.6% by sherd count is of a London source with roughly equal proportions of redwares (mostly in the form of PMR and smaller amounts of PMRE, PMSL and PMSRG) and tin-glazed wares (TGW A, TGW C, TGW D, TGW E and TGW H). There are also three sherds of London stoneware with a bowl and tankard. Essex wares represent 30% and include red earthenwares: PMBL, PMFR, PMFRG and Metropolitan slipware, besides two residual medieval sherds. Pottery of a general British source constitutes 6.4% and occur as combed slipware (STSL) and intrusive Yellow ware and English stonewares.

Pottery from the Surrey-Hampshire borders represents 3.6% and these mostly comprise equal amounts of the whiteware BORDG and BORDO and the redware

(RBOR). Pottery from the Midlands is only represented by Staffordshire brown stoneware (STBRS) tankards and constitutes 3.6%, whilst imported pottery is as 2.7% and is dominated by Chinese porcelains and German Frechen stoneware. Forms are domestic in nature and mostly are for the kitchen or the table, besides a small number of drinking forms.

The deposits the pottery was recovered from make-up layers, but also from cuts, most notably from the fills of the ditch or possible mill race [615].

5.4.3.3 Period 4

Only 36 sherds of pottery were recovered from period 4 and 22 sherds (61.1%) is of a Midlands source as white salt-glazed stoneware (SWSG and SGWS SCRB) and Creamwares (CREA DEV and CREA GRN). Seven sherds (19.4%) are from a London source and are represented by three sherds of post-medieval redware (PMR) and four sherds of delftware (TGW, TGW BLUE and TGW H).Three sherds are found in the form of Chinese porcelain (CHPO, CHPO BW and CHPO IMARI), while one sherd is of a generic British source which is of porcelain (ENPO).

There is a single sherd from Essex, in a redware (PMFR). This pottery comes from the robber trenches [295] and [297], post-holes [375], [689], [722] and [758], pit [563], masonry drain [635] and cuts [956] and [972]. The forms of the pottery demonstrate functions mostly for the table and a small number of tea wares.

5.4.3.4 Period 5

This phase produced 563 sherds of pottery and 40% or 225 sherds comes from a general British source mostly in the form of industrial finewares; REFW, TPW, besides stonewares (ENGS, ENGS BRST), porcelains (ENPO HP) and earthenwares: STSL and YELL and these are all found either in plain or decorated versions. Pottery from the Midlands with 179 sherds or (31.8%) comprises mostly as Creamwares or Pearl wares, besides a small number of stonewares (BBAS, DERBS, NOTS, RESTG and SWSG). Pottery from London is mostly represented by redware or tin-glazed wares in styles TGW, TGW BLUE, TGW C and TGW H, besides a small amount of London stoneware. These collectively constitute 107 sherds or 19%. There are 21 sherds from the Surrey-Hampshire borders these constitute 3.7% of the pottery and it occurs mostly in the redware (RBOR).

Imported wares account for 4% or 22 sherds and are mostly found as Chinese porcelain, either as the blue and white or Imari styles, while German wares are represented only by a type 2 Westerwald chamber pot (WEST CHP2) and Continental porcelain (CONP), notably as a toy jug. The other pottery types comprise residual medieval Surrey whitewares or the post-medieval East Anglian speckle-glazed redware (SPEC). The forms of this pottery indicates functions mostly for the table, or as tea wares in addition to a small number of kitchenwares.

Pottery was recovered from several make up and dump type deposits, but also from the fills of features: pits [310], [629] [703], [738], [943], [965], post-holes [217], [221] [229], [299], [304], [341], [344], [399], [436], [438]. [554], [577], [579], [607], [619], [647], [673] [675], [780], and [945], the barrel drain [691], the north south linear ditch [536], robber trench [880] and barrel [673]. Pottery also derived from a number of surfaces, such as [531], [538], [569] and [580].

5.4.3.5 Period 6

The ceramic profile for this phase is similar to the previous one. Of the 691 sherds, 555 sherds or 80.3% is of a general British source consisting mostly of industrial finewares with English stonewares and porcelains, majolica (MAJO), refined whitewares and transfer-printed wares. There are also other earthenwares, refined redware (REFR) and Sunderland-type coarseware (SUND), besides combed slipware (STSL), Rockingham ware and Yellow ware.

Midlands wares comprise 9.4% or 65 sherds and these are the same types of wares as for Period 5.

Pottery from London represents as 6.8% and stonewares (LONS) are more common than previously, whilst the coarse local redware is a frequent occurrence, but delftware is less common and reflects that it had stopped being made by this time. Pottery from the Surrey-Hampshire borders accounts for 1%, but consists of residual whitewares but also contemporary redware, although one sherd maybe from the Verwood industry in Hampshire. Imported pottery consists of sixteen sherds or (2.2%) and consists of Chinese and Japanese porcelain (CHPO BW, CHPO BATV, CHPO IMARI, JAPO), besides German stoneware, that includes contemporary Westerwald stoneware seltzer bottles, and continental porcelain (CONP) is also well represented amongst the non-native wares. Small mounts of pottery from East Anglia and Essex also occur, but are probably residual.

There are a greater range of functions to the ceramics in this phase and besides table wares and tea wares being well represented, items for display, horticulture, leisure and particularly storage also occur.

Much of the pottery in this phase was derived from layers, either alluvial in origin, or man made dump or make up layers and these often produced the more intact ceramic items from the assemblage. Features that produced pottery include the backfill of the revetment [33], postholes [91], [100], [115], [142], [147], [603], cut [154], and robber trench [544]. Pottery is also associated with the modern channel; fill [79], masonry drain [508] and from barrels [182] and [277].

5.4.4 Significance

The pottery has little significance at a local level and comprises mundane types common to this area of London. The ceramics indicate more intensive activity on the site from the late 17th century, but pottery dated to *c* 1820-1900 dominates. The ceramic profile of the site is mostly in keeping with the London area.

Of specific interest is the modified medieval orange ware sherd which forms a tool and the post-medieval redware beaker-shaped container, which if it can be associated with the cloth printing industry located in the lower River Lea Valley, may provide further evidence for the function of this vessel.

The presence of wares from the Midlands and Sunderland in the later periods may be significant as the site is adjacent to the Lea Navigation canal and, as such, was linked in to the national canal network. These wares may have arrived on the site after initially being brought in by water-borne traffic. Rockingham ware was favoured by those resident on barges, and its presence on the site further underpins this potential significance.

5.4.5 Potential/recommendations

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 or photographing.

Beyond the wares from elsewhere in the British Isles that may have arrived as a result of the site's proximity to the canal network, the assemblage is fairly predictable for north-east London.

A summary pottery report should cover the ceramic profile and the significance of the imported wares. Only the modified medieval pottery sherd requires photographing or illustrating.

Three avenues of research are suggested:

- What other evidence is there for the modification of medieval pottery sherds?
- Can the post-medieval redware beaker shaped vessel be linked to the local fabric printing industry?
- Can specific non-London wares be related to the canal network and its community?

5.5 Clay tobacco pipe and pipe clay

Chris Jarrett

5.5.1 Introduction

A small-sized assemblage of clay tobacco pipes was recovered from the site (2 boxes). See Appendix 3: clay tobacco pipe for listings.

Most fragments are in a fairly good condition, indicating that they had not been subject to too much redeposition or were deposited soon after breakage. One clay tobacco pipe is complete. Clay tobacco pipes which date from between 1640-1910 occur in 102 contexts, in small and medium sized groups (under 30 to 100 fragments), but context [333] produced a large group (over 100 fragments).

All the clay tobacco pipes (959 fragments of which 15 are unstratified) were recorded in a database and classified using Atkinson and Oswald's (1969) typology (AO) and the 18th-century examples in Oswald's (1975) typology and prefixed OS. The pipes are further coded by decoration and quantified by fragment count. The degree of milling on 17th-century examples has been noted and recorded in quarters, besides the quality of finish. The tobacco pipes are discussed by their types and distribution.

5.5.2 The clay tobacco pipe types

The clay tobacco pipe assemblage from the site consists of 195 bowls, 752 stems and eleven nibs. Thirty-two bowls are represented only by fragments and can not be identified to type or can only be given a very broad date range.

5.5.2.1 1640-60

AO9, one spurred bowl, a quarter milling, but the rim is damaged and has a fair quality finish.

5.5.2.2 1660-80

AO13: two heeled, rounded bowls, one bowl with a barrel shaped profile has full milling and good quality finish. The second bowl is a variant, possibly of a non-local source, with the bowl being more angled and with a straighter front than usual. It has no milling and is of a fair finish.

AO15: three, spurred bowls of a fair to poor quality finish and none, a quarter and three quarters milling of the rims.

AO18: two straight-sided, heeled bowls with a half or a quarter milling and of fair or good quality of finish.

5.5.2.3 1680-1710

Two bowls are present dating to this period but cannot be classified to type as they survive only has heels.

AO20: two rounded profile, heeled bowls, of a fair quality are present. Milling of the bowl rim became less important during this time and only one bowl has a quarter milling.

AO21: four heeled bowls and one has a splayed base, the other has the forename E but the family name is illegible. None of the bowls are milled. One of these bowls is a variant with a sloping heel and its rim is missing.

AO22: twelve, heeled straight sided bowls and are of a fair finish, but mostly good quality and when milling of the rim is present it is either half but mostly a quarter of the rim. One bowl has the initials W M on the heel for the maker William Manby I, 1681-96, Aldgate.

5.5.2.4 18th century

Thirteen bowls represented by fragments are dated broadly to this century.

1700-1770
AO25: five bowl heels that can not be assigned to Oswald's 1975 London typology are present. One bowl is marked P B with crowns above each letter and this bowl was possibly made by Peter Branbury, recorded in 1696. Another bowl survives mostly as a heel and is marked I S, and the closest, documented pipe makers for this time are John Smith (3), 1729, St George in the East, or John Saltonstall, 1744-63, Limehouse.

1740-1800
AO26: one damaged spurred bowl with the initials ? K, the forename being damaged.

1700-40:
AO24: one possible example of this American export bowl survives as a base with no evidence for a heel or spur.

OS10: 54 bowls have been identified in varying degrees of completeness and ten examples carry maker's marks:

R B:possibly Robert Bowes, 1719, R. Barrett, 1719, Richard Bryant, 1733-40. One bowl.

E C: no maker known for this period but Elizabeth Collett is known in 1762, Goal Yard, Drury Lane. One bowl.

D ?I: family name uncertain. One bowl.

W M: William Manby II, 1719-63, Limehouse and other work shops in south -east London. Four, possibly six bowls with one example having the family name smudged and another survives as a heel.

I W: several makers known for this period (see Oswald 1975, 148), but John Watts, 1731, Whitechapel is the most locally known master pipe maker.

1730-1780
OS12: nine heeled bowls and six have initials or are marked:

. .:: one bowl with raised dots on each side of the heel

R B: three bowls each made in a different mould, possibly Robert Baldwin, 1749, Chymister Alley, St Martin's Westminster, but probably represents an as yet unidentified pipe maker.

?W H: forename possibly W, possibly William Huggins, 1739-42, Green Dragon Alley, St Annes, Limehouse.

Two other bowls are marked, but on one example the initials are faint or illegible, while the other example has a badly damage heel and the initials are not readable.

OS 22: a single spurred bowl with an incuse circular stamp with 'FORD STEPNEY' and I F on the spur. This could be an over sized AO28 bowl, made by John Ford (2), 1805-65, Stepney

1780-1830
AO27: eight heeled bowls of which all are initialled:

J B: one bowl survives mostly as a heel, probably either James Bourne, 1799-1832, Bethnal Green, John Birch, 1823, Whitechapel; there are many contemporary makers with the same initials (see Oswald 1975, 131).

P B: Paul Balme, 1832, Mile End Road. A poorly moulded 'Fox and Grapes' public house pipe (Atkinson and Oswald 1969, 189, 183, fig. 7.44).

J D: James Davis 2, 1826-32, Cromer Street, John Dearden, 1805-40, Edgware Road. Both unlikely to be the pipe makers.

I F: John Ford (2), 1805-65, Stepney.

I S: three bowls, but no pipe makers are known locally (see Oswald 1975, 145)

C W: Charles Walford, 1828. This is possibly from a remoulded mould as there is an inverted V below the C initial.

5.5.2.5 19th century

Five fragmentary bowls can only be broadly dated to the 19th century by their decoration of leaf borders. One bowl has an incuse shield stamp with 'BALM[E] MIL[E] END' (see below) and another stem has in relief the legend 'T U ?R ?N...'.

1820-1860
AO28: twelve bowls, two bowls have acorn and oak leaf borders and nine bowls are marked:

* *: two bowls, but both survive as mostly spurs.

I F: one, possibly two bowls where the forename is illegible. Possibly John Ford (2), 1805-65, Stepney or Jesse Ford, 1836-77, Mile End Road.

? I, forename is illegible. The bowl is decorated with an acorn and oak leaf border.

?R S: one bowl surviving as a spur, family name is illegible and there are no local pipe makers recorded (see Oswald 1975, 146).

1840-1880
AO29: six bowls and all are maker marked. One bowl has large raised annular marks on each side of the heel.

I ?, one bowl with family name initial missing, but the bowl has acorn and oak leaf borders.

G B: two bowls with G B initials on the heel and one has oak leaf borders. A second bowl has an incuse shield stamp on the back of the bowl with the legend 'BALME MILE END *' for George Balme, 1867-76, Mile End Road.

K G: one bowl with a poorly impressed shield stamp on the back of the bowl with the legend 'KIPPS & GLIDE *'*c* 1860

M L: one bowl with a slightly sloping rim, probably Mrs M. Leach, 1848-69, Whitechapel.

1840+
AO33: there are four of these Irish-type bowls and none have maker's marks.

1850 +
AO30: eleven bowls of which one is a complete plain, cutty type (short bowl) 118mm in length. A number of these bowls are highly decorated. One bowl has fluting around the rim containing a flower and around the base there are scallops that continue on to the rim (resembling a type called the Tulip in Pollocks 1879 catalogue). Two other bowls have a band of beaded moulding below the rim and a triangular stem. Another bowl has scale decoration in relief. Some of the AO30 bowls are fragmentary, but often have pronounced ribs on the back of the bowl, while another fragmentary example has on its stem incuse stamps with [MILE] END' and '? I..' on the other side and dates from *c* 1870.

A stem from this possible type of bowl shows evidence for fluting on the pipe but the stem has in relief a lozenge with a beaded surround and loops at each end and marked in each lozenge is 'CORNWELL' 'LONDON', for John Cornwell, Stepney, working 1854-92, but recorded 1854-68, St George in the East and 1880-1992 at Ratcliffe.

5.5.3 Pipe clay object

A single moulded dolls leg made from pipe clay is present and is detailed with a boot and stocking.

It was recovered from Period 6 and fill [94] of the channel and is dated by its association with pottery to after 1884.

5.5.4 Distribution

The distribution of the clay tobacco pipes is shown in Table 1 which shows the phase, the number of fragments, the date range of the pipes, the latest dated type and a spot

date for each context the material occurs in. A list of the bowl types and makers initials is also shown for each deposit. Clay tobacco pipes occur in Periods 3–6.

5.5.4.1 Period 3

Clay tobacco pipes are found in 23 contexts in this phase and consist of 436 fragments of which 86 are bowls. The earliest bowls are spurred types found with examples of an AO9, dated 1640-60 in context [614] and an AO15 dated 1660-80 in context [224]. Thirteen bowls date to between 1680-1710 and one has a maker's mark; an AO22 with W M. The single possible AO24 American export bowl is found in deposit [627] and it dates to between *c* 1700-40. The 47 OS10 bowls of an18th century date, when initialled are mostly by the maker William Manby 2, 1719-63, but a single examples is initialled E C. There is a single intrusive late 19th-century AO30 bowl for context [614].

The types of deposits the bowls occur in are layers: [333], [627] and [1020], fills of the probable mill race [615] and channel [985], pits [696] and [970] and gully [332].

5.5.4.2 Period 4

There are 45 fragments of clay tobacco pipes found in ten contexts for this phase. Only ten bowls are recorded and the earliest is an AO18 type dated 1660-80 found in robber trench [475]. 1680-1710 dated bowls occur as an AO21 E ? marked example in cut [615] and an AO22 bowl was found in pit [563] and 18th-century AO25 bowls occur in gully [209] and cut [972]. An R B marked OS10 bowl was recovered from post-hole [375].

5.5.4.3 Period 5

In Period 5 there are 39 contexts that produced a total of 288 fragments of which 56 are bowls. Three bowls date to between 1680-1710. Other probable residual bowls in this phase are two AO25 bowls and one is marked P B, while four examples of the OS10 bowl are present and two are marked with either I W or W M. Other heeled 18th-century bowls are represented by nine examples of the OS12 type and there are single examples marked with . . , R B and ?W H. A single spurred AO26 bowl is marked ? K and came from post-hole [371]. There are five AO27 bowls dated 1780-1830 all of which are initialled: J B, P B, J D, I F and I ?S. Five examples of the spurred AO28 bowl dated 1820-60 have been identified and single marked examples comprise * *,? ?F and I F.

Later bowls are as three examples of the 1840-80 dated AO29 bowl with a dot on each side of the spur and the initials G B and K G, and single 1840 onwards dated bowls as a heel less AO30 and an AO33 Irish-type. A number of bowl parts found were too fragmentary to be identified to type.

The deposits the bowls occur in comprise make up and made ground deposits and a number of features: postholes [217], [219], [227], [229], [436], [438], [607], [619], [647] and [673], the north-south linear cut [536], robber trench [848], pits [943] and [965].

5.5.4.4 Period 6

There are 26 contexts that produced a total of 147 fragments of clay tobacco pipes in this phase of which 39 comprise bowls. Seven of these date to between 1660-1830 and can be considered residual. Contemporary bowls in this phase are eight AO28 bowls. Examples with maker's marks are * *, ? G, ? I and ?R S. The AO29 bowls are as three examples and initials consist of I ?, G B and M L. Additionally there are seven AO30 types which include a complete example from channel fill [79] and a single AO33 Irish bowls; the latter late 19th-century bowls do not carry maker's marks, but do include decorative examples.

The clay tobacco pipes come from fills of the channel, but also from make-up layers. Features that produced this material are cut [278], robber trench [544] and postholes [603] and [607].

5.5.5 Significance

The clay tobacco pipes are of significance at a local level and provide some evidence for the types and possible makers supplying the locality. Other assemblages of clay tobacco pipes have been recorded nearby as well as on other archaeological excavations within the Olympic site. These, therefore, provide a larger context for the interpretation of this group.

5.5.6 Potential

The clay tobacco pipes have the potential to date the contexts they were found in and approximately six pipes require illustration.

Together with the other archaeological excavations within the Olympic site, the OL-06507 assemblage adds to the information for the clay tobacco pipe industry of Stratford and east London, as well as details of their use in this extensive wetland environment over the post-medieval period.

5.5.7 Research aims

A number of research aims can be suggested as possible avenues of research.

- Can documentary research uncover any as yet unknown local pipe makers that match with the initialled bowls?
- Can the distribution of the pipes be related to domestic or industrial activities associated with their owners?
- Do the Irish-type bowls correlate with the ethnicity of residents or workers within the environs of the site.

5.5.8 Recommendations

Publication of the site should include a summary report on the clay tobacco pipes and include illustrations of approximately six bowls. Research into local pipe makers is also required.

5.6 Ceramic building material and stone

Kevin Hayward

5.6.1 Introduction

Two hundred and twenty nine examples of post-medieval and early post-modern ceramic building material (brick, floor, wall and roofing tile) and nine examples of medieval and post-medieval stone were retained and examined using the London system of classification with a fabric number allocated to each object. See Appendix 4: ceramic building material for listing.

5.6.2 Discussion

This large building material assemblage is dominated by unfrogged, stock moulded early (1450-1700) to late post-medieval (1700-1800) bricks forms and fabrics.

There are no Roman fabrics whilst medieval construction materials are limited to some abraded peg tiles from the alluvial silty and sandy clays [831] [851] and the reuse of stone mouldings. Two examples reused in the late 18th/early 19th century drains [507] and edging [605] were probably parts of column bases. The respective stone-types, Reigate stone from the Upper Greensand Mertsham-Reigate area of Surrey and Taynton stone from the Jurassic of Oxfordshire have been used in quantity in many medieval ecclesiastical buildings throughout London such as Merton Priory (Miller & Saxby, 2007, 117-118) and Westminster Abbey (Hayward pers obs.) and courses of walling often inter-digitate between these two types of materials. The good preservation of the glauconite-rich Reigate stone is an indication that the moulding was for internal use as this rock easily breaks up during exposure to weathering (Hayward 2008). The harder Taynton stone may have been for external use.

The origin of these mouldings is not, of course, clear. The most obvious candidate is the nearby St Mary Stratford Langthorne, where Reigate stone was used in very large quantity in the period 4 and 5 abbey (Barber et. al. 2004, 132-138). However, the availability of reused stone following the dissolution of the monasteries would have been considerable in London and any one of the many ecclesiastical buildings from the city or sited along the Thames embankment would have provided a ready quarry of stone. Ready stockpiles of stone would have been available from builder's merchants and the transport of bulky stone by River to Temple Mills by the Thames and then the Lea would have been straightforward. The Kentish ragstone and Hassock stone rubble 113] [204] may have also originated from these sources. However the York stone [742] and Carrara marble [344] paving from this site are common post-medieval fabrics.

The walls of the earliest industrial brick building [441-442], including the sunken structure (oven) [490] in the south of the trench was built almost entirely thin but wide Tudor-type stock moulded red fabric 3033 and mottled fabric 3039 bricks (1450-1700) and transitional 3032nr3033 post-great fire maroon bricks (1666-1725). This would indicate that the structures were built between the late 17th and early 18th century corroborating with the evidence from the stratigraphy.

The brick used in the later walls e.g. [27-31] of the N-S aligned terrace of six cottages consisted of a mixture of fabrics and forms. These include the widespread reuse (in 19th century gravel cement) of the same thin-red and transitional fabrics from the underlying industrial structures-which may indicate that early post-medieval activity would have been much greater than previously thought. In addition to this, unfrogged and frogged purple post-great fire clinker bricks fabrics 3032; 3034 are used for the

first time in these walls. As frogged bricks were only manufactured after 1750 then these structures can only date from the second half of the 18th century at the earliest. However, the presence of Roman cement (Patented after 1790) and stock moulded London stock fabric 3035 (manufactured after 1780) e.g. [751] instead suggests a date more like the early 19th century.

As well as the walls [753] of the housing, drains [542] and edging [all underwent a series of repairs or replacements from the middle of the nineteenth century onwards. This is shown by the use of machined kiln bricks, the re-introduction of red bricks and machined London stock bricks – all of which could only have been manufactured after 1850. Repointing is evident too with the use of Portland cement [527] (patented after 1830) and gravel cement e.g. [19]. Finally, the inclusion of yellow stock moulded bricks fabric 3035 [538] [540] would indicate that the Cobbled streets were constructed after 1780. The widespread reuse of poor quality old bricks would also indicate that this was the case.

In summary, the evidence from the building material assemblage at Temple Mills provides a snapshot into the nature of the early and late post-medieval buildings along the banks of the River Lea.

What is particularly interesting about this site, however are the forms and fabrics of the reused moulded stones. The reuse of column bases in Taynton stone and Reigate stone as well as Kentish ragstone or Hassock stone rubble is an indication, at one time, of a high-status medieval building in the vicinity such as St Mary Stratford Langthorne. The other possibility of course, is that the material could have come from the City itself.

5.6.3 Recommendations

Finally, there is no recommendations for further work, other than an overview needs to be undertaken on the use and reuse of medieval moulded stone at sites along the River Lea (including reference to this site and the published St Mary Langthorne (Barber et. al. 2004). Finally, a summary of the assemblage should be included in the publication of the archaeological sites from the Olympic development area.

5.7 Glass

Sarah Carter

5.7.1 Introduction

The material was quantified for each context by colour, form and date. The glass assemblage has been entered into a database. The material ranges in date from the 17th to the 20th centuries.

See Appendix 5: glass for listing.

Of the 516 glass fragments recovered from 66 contexts, 15 fragments were from unstratified contexts. The remaining 501 fragments are from stratified contexts many of which are levelling and dumping layers. This, along with the fragmentary nature of the glass, indicates that much of the assemblage is from secondary or possibly even tertiary deposits. 232 fragments (46%) are vessel glass of identifiable form.

Of the utilitarian forms, 179 are bottle fragments, 5 are jar fragments and 13 are phial fragments. The tablewares are represented by 5 drinking glass fragments, 1 vase fragment, 1 dish or bowl fragment and one handle from a possible jug.

Other glass includes stoppers (4), a marble and some miscellaneous glass which may be industrial in nature.

A fair amount of cullet, moils and even a small trail of glass were recovered which are thought to have been redeposited.

Seventy-five fragments are from indeterminate vessels and the remaining 130 fragments are window glass.

5.7.2 Utilitarian wares

5.7.2.1 Bottles

The bottle glass ranges in date from the early 17th to the 20th century. All the usual types of bottle are represented. The majority (98 fragments) are from wine bottles with 19 fragments of soda bottle, 11 from spirit bottles and a further 11 from sauce or other foodstuffs bottles. Medicinal bottles (8 fragments) and beer, milk, ink, perfume or cosmetic bottles are also represented. 9 bottle fragments are from unidentifiable forms and 5 fragments are from case bottles.

Much of this assemblage has been recovered from areas of dumping and ground make-up, is redeposited and can therefore tell us nothing about the activities on the site. However, a very early case bottle, dating to the 17th century was recovered from context 845 and early wine bottle fragments dating to the mid 17th–18th centuries were found in the fills of the millrace (context 615). A seal from a wine bottle with "Jam s Barrow" and the date 1732 was found in context 971. This may originate from a family living in Suffolk and Cambridge in the 16th century (Dumbrell 1992 pp235).

5.7.2.2 Phials

Fragments from phials were recovered from the site. Two (contexts 641 and 930) date from the 17th – 18th centuries. The remainder are all later, dating to the 19th – 20th centuries. 5 complete phials were found in context 94, the fill of a channel.

CONTEXT	NO FRAGS	COLOUR	COMMENTS	DATE
94	1	colourless	Probable base fragment of a phial with a small kick	Mid18th - 19th C
94	1	colourless	Very poorly finished small phial with a cracked off rim	L19th - 20th C
94	1	colourless	complete small phial with short neck and everted rim	L19th - 20th C
94	3	colourless	3 complete small phials with short necks and everted rims	L19th - 20th C
94	1	colourless	complete phial with cork and liquid intact	L19th - E20th C
105	1	green	complete small phial with short neck and everted rim	L19th - 20th C
105	1	green	small phial with cracked off rim	L19th - 20th C
105	1	natural pale green	D-sectioned phial with cracked off rim	L19th - 20th C
215	1	natural pale green	very thin glass fragment probably from a phial	19th - 20th C
641	1	green	Small phial base with conical kick	L17th - E18th C
930	1	natural pale green	With conical kick and pontil scar	Mid17th - L18th C

Table 19 Distribution of phials

5.7.2.3 Jars

Only 5 jars were recovered, (contexts 43, 55, 94 and 105) all dating to the 19th – 20th century.

5.7.2.4 Other utilitarian vessels

Other utilitarian glass found in the excavations includes 3 stoppers (2 from context 94 and one from105), one marble (context 514) probably from the neck of a soda bottle and 21 miscellaneous items including a glass dropper (context 79), what appears to be a large lens (context 43) and a tube of barley-twisted glass of unknown use (context 105).

5.7.3 Tablewares

5.7.3.1 Drinking Vessels

Only five fragments of drinking vessels were recovered. The earliest fragment is the stem of a wine glass. It has a baluster stem with a knop at the top and an annular knop lower down and has a long tear through the knops and stem. The bowl is funnel shaped. It can be dated to *c* 1700-40 (context 94). Three other fragments are from the feet of wine glasses dating from the late 18th–19th centuries (context 253) to the 19th –20th century (context 94 and 514). One fragment is from a tumbler (context 847) and dates to the late 18th – 19th century.

5.7.3.2 Other Tablewares

The only other identifiable tablewares amongst this assemblage include one fragment from the handle of a possible jug (context 94), one fragment from a possible vase (context 79), one fragment from a possible bowl or dish (context 276) and a cut glass decanter stopper (context 79). All, bar the stopper, are very fragmentary so identification is not definite. The quality and colour of many other fragments would indicate that more of the assemblage than what is identified as such derives from tablewares, however, the fragments in these cases are so small that identification of form is impossible with any confidence.

5.7.4 Conclusions

In spite of the fact that the majority of the glass was excavated from dumping, levelling or made ground deposits, the glass confirms, at the very least, the duration of activity on the site.

The case bottles indicate activity from the mid 17th century, early wine bottles confirm this whilst more wine bottles and phials indicate continued activity during the 17th– 18th centuries. During the 19th and 20th centuries activity increased on the site and this is reflected by the increase in quantity of fragments from that period.

Unfortunately, none of the glass can be securely associated with the known industrial activities on the site despite the industrial nature of some of the fragments.

5.7.5 Potential and recommendations

The glass fragments represent a range of forms including wine, medicinal and drinks bottles and window glass .The majority of the glass, however, is from unidentifiable forms. This reduces the significance of the assemblage and minimises its potential.

The glass from the excavations should be compared with assemblages from other such industrial-era/type sites and should be viewed in conjunction with the glass from the other Olympic sites.

The bottle seal (context 971) should be illustrated.

5.8 Registered finds

Märit Gaimster

5.8.1 Introduction

Over 200 metal and non-metal registered finds were retrieved, with the vast majority from Periods 5 and 6 where they relate to occupation in a row of terraces in the western part of the site.

A smaller assemblage of finds relate to an industrial building recorded in Period 3. All finds are listed in Appendix 6: registered finds, and are discussed here by period.

5.8.2 Period 3

Some forty finds were retrieved from Period 3 contexts; all appear to relate to an industrial building with a forge and associated mill run in the south-western part of the site. The assemblage includes numerous iron nails and other fittings, such as an iron collar sf <63>, a probable staple sf <70> and strap or binding. Of particular interest are the numerous pieces of slag suggestive of copper-alloy working, including material redeposited in Period 4, below. In addition there is a piece of lead waste, a piece of copper-alloy sheet or pipe and a possible copper-alloy coin sf <45>. An unstratified double-sided ivory comb may belong to this phase sf <72>. The type is particularly common in the 16th and 17th centuries, but appears also in 18th-century contexts (Margeson 1993, 66–68).

5.8.3 Period 4

The finds from Period 4 are largely the product of the demolition of the Period 3 industrial building. They include several pieces of slag indicative of copper-alloy working, along with a substantial piece of lead waste. Besides a handful of iron nails, the only other small find retrieved from Period 4 is part of a glass and mercury thermometer sf <22>; this is likely to be intrusive.

5.8.4 Period 5

Over sixty individual finds were recovered from Period 5. The vast majority appear to be associated with a probable industrial building in the south-western part of the site, comprising a brick structure with an external cobbled surface; a series of barrels or vats to the north may also be associated with this complex.

The finds comprise numerous iron nails and fittings, but also a probable iron chisel sf <66> and an incomplete iron key sf <69>. A small group of dress accessories including two copper-alloy buttons sf <43> and a pair of dished bone buttons sf <21>. A button-like lead disc with two small central perforations sf <20> is most likely a weight; similar objects were used to weigh down skirts and curtains during the 18th to early 20th centuries (Bailey 2004, 83). There were also two copper-alloy pins sf <54> and the fragment of a small tin or pewter container sf <59>, possibly a mug or other drinking vessel.

A small assemblage of finds was retrieved from a brick and cobble surface associated with drainworks in the centre of the site. These include small metal bars and straps sf <55>, possibly offcuts, and a complete lead type or stamp with 'S.B.&Co.' sf <56>. Also from this area came a small copper-alloy lock plate sf <57>, probably from a casket or a small chest, and an incomplete iron horseshoe. In the south-west corner of the site, close to the *in-situ* row of terraces, the fill of drain cut [570] produced an iron knife with a bone handle sf <61>.

5.8.5 Period 6

Period 6 comprises the largest group of finds from the site; however, the majority of these items were recovered from the channel fills and revetment. Only a small amount of finds come from contexts directly associated with the row of terraces present in the western part of the site from the early 19th century and until the second quarter of the 20th; these finds were mainly from the fills of drain [508].

The numerous finds from the channel include five enamelled vessels; one of these is a 1911 coronation souvenir cup with the portraits of George V and Queen Mary sf <28>. Household objects are also reflected in a complete copper-alloy spoon sf <37> and the base of an enamelled kerosene lamp decorated in white and gold sf <27>. Unstratified finds likely to date from Period 6 include a silver-plated teaspoon sf <35>, an iron fork with bone handle sf <60> and two fragments of a ceramic figurine sf <71>. Other finds from the channel relate to industrial activities in the area, notably two carbon rods that may be associated with electrolysis or an electric-arc furnace sf <80> and <83>. There are also two enamelled signs sf <30> and <31> and a substantial iron suspension weight, perhaps for a heavy door sf <64>. Possible small-scale industrial activities may be reflected in the several hundred minute glass beads sf <82> and two small jet rings sf <81>, possibly linked to textile work and embroidery. More directly associated with the channel and boat traffic is the probable sounding lead sf <47>; two probable fishing weights were also retrieved, one from a dug-down barrel in the very south-east of the site sf <41>, the other unstratified sf <36>. Unstratified is also the complete iron-and-wood hame from a horse harness.

The fills of drain [508] produced a finely worked jet bead sf <10> and a further probable black glass bead sf <17>, and numerous other small dress fittings and accessories. They include a two-piece oval locket frame of copper alloy sf <16>, two wire dress hooks sf <11> and <53>, a small perforated bone disc, possibly a button sf <13>, and numerous copper-alloy pins sf <12> and <52>, along with some fragments of textile. There were also a slate pencil sf <14> and fragments of a tin or pewter container sf <51>, similar to sf <59> above. An unstratified jet pin sf <77> and dished shell button sf <74> are likely to belong to this phase. A further slate pencil sf <76>,

two stone alleys sf <75>, a lead toy figurine sf <1> and a crudely made domino piece sf <73> are also unstratified.

Also more directly associated with the *in-situ* row of terraces are the fills from the buried barrel [182] in the south-west corner of the site; besides the already mentioned fishing weight, these yielded a copper-alloy curtain ring sf <40>, a heel iron sf <67>, an S-shaped iron meat hook sf <68> and the door of a wood-and-wire bird cage sf <62>. A levelling layer in front of the terraces produced a pistol-shaped bone cutlery handle, carved with the initials 'I' and 'H' sf <4>; this is likely to be a redeposited 18th-century object, or perhaps an heirloom piece of cutlery. Finally, some finds appeared from levelling layers associated with the construction of the N–S road surface sometime in the 19th century. A near-complete iron trowel with a whittle-tang handle sf <65> came from the filling-in of the, originally, Period 5 barrels or vats in the south-western part of the site. From the levelling directly under the road came a fine greensand stone hone with numerous cut marks sf <84>.

5.8.6 Recommendations

The metal and other small finds form an integral component of the material recovered during excavation and should, where relevant, be included in the further publication of the site.

At Temple Mills, these finds will make an important contribution to our understanding of households and industrial activities in the area during the later post-medieval period. For this purpose, a number of objects require x-ray and further identification; these are marked in Appendix 6: registered finds. In Period 3, these include the possible coin sf <45> and the copper-working slag; the latter should be analysed further for information of processes that may be associated with the industrial mill in the south-western part of the site at this time. In Period 4, the glass-and-mercury thermometer sf <22> requires further identification. The first mercury thermometers were developed in the early 18th century, although the Temple Mills fragment is more likely to be an intrusive find. In both Period 5 and Period 6, the assemblage includes finds that relate to industries and small-scale business, such as the lead type sf <56>, the carbon rods sf <80> and <83> or the numerous small glass beads sf <82>; these finds need to be discussed against the context of industrial activities in the area during the 19th and early 20th centuries. Two probable fishing weights or net sinkers sf <36> and <41> and a lead sounding weight sf <47> provide material relating to the channel and riverboat traffic. The numerous household-related finds, finally, are significant evidence of households and the daily life of industrial workers and small-scale traders in the Victorian and Edwardian periods.

5.9 Iron slag and related debris

Lynne Keys

5.9.1 Introduction and methodology

A small assemblage (weighing just over 14kg) was examined for this report (Table 20).

It had been recovered by hand on site and from soil samples processed after excavation. Examined by eye and categorised on the basis of morphology, each slag

or other material type in each context was weighed. The three smithing hearth bottoms were individually weighed and measured to obtain statistical information. Quantification data are given in the table below in which weight (wt.) is shown in grams, and length (len.), breadth (br.) and depth (dp.) in millimetres.

cxt	Slag identification	wt	len	br.	dp.	comment
79	Charcoal	0.5				
79	Cinder	3				
79	Coal	1				
333	Iron	87				casting?
333	Iron	470				
333	Iron	4317				casting?
333	Undiagnostic	73				laminated coal inclusions
333	Undiagnostic	567				
392	copper alloy waste	91				
488	smithing hearth bottom	297	110	95	65	
488	Undiagnostic	11				
488	Undiagnostic	169				possibly part of smithing hearth bottom
489	Crucible	461				fragments; used for Cu working
505	Cinder	122				
614	Cinder	55				
614	ferruginous concretion	229				
614	Iron	53				
614	Iron	1079				
614	Iron	1093				mortar on one side
627	Cess or tanning waste	393				
627	Iron	26				
627	smithing hearth bottom	499	100	100	40	incomplete
627	smithing hearth bottom	3207	240	180	140	
627	vitrified hearth lining	165				
641	Cinder	67				and coal
641	Undiagnostic	199				one piece
686	Iron	11				lump
686	vitrified hearth lining	7				
847	Crucible	11				
847	Undiagnostic	53				
919	Iron	19				
921	copper alloy waste	5				
930	furnace lining	96				
930	Iron	38				from casting
941	copper alloy waste	108				
955	copper alloy waste	69				
955	Glass	0.5				
957	copper alloy waste	51				
960	Iron	17				
964	Iron	42				
964	Iron	446				fragment of thick vessel?
	total wt	**14232g**				

Table 20 Distribution of iron slag and related debris

5.9.2 Quantification and explanation of terms

Some of the slag was undiagnostic: ie it could not be assigned to either smelting or smithing either because of morphology or because it had been broken up during deposition, re-deposition or excavation.

Other types of debris in the assemblage may derive from variety of high temperature activities - including domestic fires - and cannot be taken on their own to indicate iron-working was taking place. These include fired clay, vitrified hearth lining and cinder.

The diagnostic slag (three smithing hearth bottoms) represents smithing. No hammerscale appears to have been recovered.

Iron of a heavy, virtually non-magnetic type was found in several contexts. This may be casting waste or a type that is rust-resistant, but at the moment this is not certain.

Copper-alloy waste was frequently encountered amongst the assemblage, as were occasional fragments of crucible (one had been used for copper-alloy working).

5.9.3 Key groups

5.9.3.1 Layer 627

This contained two smithing hearth bottoms: one quite large and the other incomplete.

5.9.3.2 Layer 488

From this demolition layer came one complete smithing hearth bottom and some undiagnostic slag that be part of another smithing hearth bottom.

5.9.4 Discussion

The assemblage consists of some smithing slag, some possible waste from iron casting, copper alloy waste and crucible fragments from working of copper-alloys. It appears likely that the material is related to a local industrial activity.

5.9.5 Significance

The assemblage overall is of local interest, however the group related to post-medieval copper working is considered of local and regional importance.

5.9.6 Recommendations

Any sample residues not processed or examined at the time of assessment will require examination and quantification.

The assemblage should be fully considered and analysed in the light of the documentary source material and the stratigraphic record.

5.10 Leather

Quita Mould

5.10.1 Introduction

The leather was scanned, identified and diagnostic measurements were taken where necessary.

The leather is wet, washed and stored in double polythene bags closed with metal staples.

5.10.2 Mid 16th-mid 17th century

A heavily worn, one inch, stacked leather heel from a right shoe of adult male size was found in fill [930] of a ditch [615] possibly the mill race. The fill [930] contained pottery dating to 1660-1700 and clay tobacco pipes dating to 1700-1740.

5.10.3 19th century

A heavily worn, one inch, stacked leather heel with iron nails around the edge from a left shoe of adult size was found in backfill [521] with pottery dating to the 19th century.

The lower, barrel, part of a moulded cattle hide rifle or musket holster, known as a rifle bucket, for suspension on a saddle was found in fill [181] of a barrel. The barrel fill contained 19th century pottery and clay tobacco pipes dating more widely to 1590-1910.

5.10.4 Potential

The recovery of a rifle buckets is surprising. The recovery of these items from archaeological contexts is extremely rare. Only one example, dating to the Civil War, found in the well at St. Paul-in-the-Bail, Lincoln (Mann 2008), is known to the author. The identification of a further fragment of rifle bucket from the leather assemblage from Trench PDZ3.39 (OL-04407) should therefore be compared and contrasted. The two rifle bucket parts were found on sites some 1.5 km apart, however, having both an upper part and a lower part represented it is possible that one joins the other, and this aspect will need to be considered during analysis.

It is possible that the holster parts may be considered worthy of a separate note in an appropriate publication, the opinion of an military equipment specialist must be canvassed during analysis.

5.10.5 Recommendations

The leather should be conserved to allow study and long term archive storage.

A basic record of the leather should be made, as specified in the RFG &FRG 1993. The two pieces of holster and strap should be subject to analysis. A visit to the Royal Armouries in Leeds would allow the items to be categorised, dated and any comparanda identified. The harness should be shown to a saddler if not readily identified by the Royal Armouries staff. The leather can then be summarised for incorporation into the site narratives. The two holster parts should be illustrated.

5.11 Timber

Damian M Goodburn

5.11.1 Introduction

Anaerobic conditions preserved the historic woodwork discussed here. A sampling strategy was used to deal with the timber present. Many timbers were partially exposed and planned but not lifted for more detailed recording, for reasons of safety and access. Others where sampled because the worked items were repetitive in nature

such as in the case of roundwood stakes, or they were both common and recent, for example the staves of the mid Victorian revetment.

Circa 65 items of worked timber and roundwood were lifted and recorded in detail. After cleaning this material was scanned and, where required additional records made. These records comprise proforma timber sheets with measured sketches and selected drawings to scale on gridded film, together with selected detailed photographs. These records are in-line with the standards set out in the English Heritage Guidelines on Waterlogged Wood, 2nd edition, and the Museum of London Archaeological Field manual 2nd edition.

A wide range of species and types of timbers were encountered, with some imports. During the recording of the cleaned lifted material, items of common native species that can be reliably identified by sight, such as oak or elm, were not sampled, but a range of less distinctive deciduous timber and roundwood items were. This latter group resembles willow or poplar (pale grey–cream coloured, poorly marked wide rings, soft), although this identification requires further checking. Some of the material is softwood (ie *coniferous* sp), probably north European pine (Scandinavian or Baltic). This has also been sampled.

Although tree-ring dating such softwood material has been achieved (eg locally at the House Mill at Three Mills, Bow) it is difficult and as most of the softwood found on this project was clearly reused, so dendrochronology has not been attempted in this case. Finding suitable oak timber samples for dating was extremely difficult as most of the timber was fast grown with too few rings, or reused and missing sapwood. At present for dating we therefore rely on associated finds of pottery and tobacco pipe. This appears to broadly fit with the dating indicated by the range of timber materials and working methods evidenced in the woodwork itself: eg the presence of pit-sawn slab waste timbers. These by products of sawing out larger main timbers for shipbuilding and carpentry are common components of low-status post-medieval woodwork assemblages found in the London region.

The timber structures ranged from a late industrial-age revetment of timber with iron elements to remnants of earlier revetments of roundwood stakes implying a wattle superstructure. Other structures included a timber-framed mill race channel and foundation pile alignments/or trackway supports, dating from the late 16th to early 17th centuries. Decayed remnants of wooden casks reused and set in the ground as tanks in the Georgian period were also identified. Very decayed remnants of the oak sill timbers of a north-south range of timber framed terraced cottages also survived.

A considerable number of the stakes, piles, posts and beams incorporated in these structures were reused from buildings, and barges, or were off-cuts, probably from ship and barge building industries located further to the south. A wide variety of species of timber were used. There appeared to be some evidence of the bases of growing, possibly deliberately planted trees along the banks of the Tumbling Bay north-south ditch. Pollarded willows are classic riverbank trees in the region today.

5.11.2 Location of the site, its context and tidal levels

Recent work on waterfront sites in the region has included excavations of the remains of tidal and river mills or parts thereof dating from the mid Saxon to industrial periods. Several of these include archaeological projects in or close to the Lea Valley

itself such as excavations by MoLAS at 150 Stratford High Street which included several phases of tide mill on the Waterworks River channel from the 17th to mid 19th centuries, and excavations by PCA at Barking Creek where abandoned mill timbers were found.

The structural woodwork recorded on these waterfront sites has been closely dated, principally by tree-ring dating and it is now clear that variations in the use, working, jointing, fastening and wood species of timber can indicate broad dating. Comparative variations in subtle features such as the proportions of large timber used versus small roundwood and the species range and inclusion of reused or 'off-cut' material can also broadly indicate the status of the work.

The site is located just to the east of the current main channel of the Lea which is still fairly strongly tidal at this point. Since the late 1970s, closely-dated timber waterfront structures and associated dryland surfaces, such as roads, building floors and yard surfaces have been used as indicator levels for changing high tide levels on the lower Thames and its estuary. Recently, the terms of reference and periods covered by the data have been expanded and refined although much of this work has not been published yet. In short, although more work needs to be done in this field, we do have considerable information on approximate levels of large high tides from all but the end of the Roman and early Saxon periods where there is still a gap. This approximate OD level/dating relationship clearly applies at the Leamouth, but may be slightly effected by the gradient effect by the time the tidal flow has reached Temple Mills. However, the known trends in Thames side levels and dating still seem broadly applicable even as far up as this site. Very recently, a few sites have also started to produce dated approximate low tide levels, so that we can start to refine our understanding of past tidal amplitudes and tidal forces (eg the recently discovered East Greenwich 12th century tide mill). Clearly trends in tidal levels are fundamental to understanding the operation of historic ills and navigation on the Lea and this site has important data relating to these issues.

5.11.3 The key historic woodwork from Period 3

5.11.3.1 Walkway

A north-south line of piles and smaller stakes mostly set in pairs, over a length of *c* 13m, was recorded.

The piles were driven into alluvium, *c* 0.40–0.60m apart. The highest pile top was at *c* +3.24m OD, and the top of the alluvium up to *c* 3.50m OD elsewhere.

This feature has been interpreted as a support for either a board walk over wet ground or part of a timber-built foundation. The London region corpus contains many examples from the later medieval period onward where the ground was wet, as at Temple Mills. A common post-medieval method was to drive piles in parallel lines and cap them with thick planks, upon which masonry was then laid for dwarf walls for timber buildings or heavier masonry or brick walls, as, for example, at Bellamy's Wharf Rotherhithe. In the post-medieval period in the London region the timbers used were often second-hand ship timbers or ship yard off-cuts, both for the piles and capping planking. A counter argument to this interpretation might be that the pile line does not have return foundation lines at each end.

Initially, the group of piles was thought to be late medieval but as soon as several lifted examples were cleaned it was clear they showed features more typical of the 16th to 17th centuries, such as being partly of elm (eg pile [999] and [989]). The technological features of this group would easily correspond with the *c* late 16th to early 17th century.

The piles and stakes of the Period 3 pile alignment comprised a heterogeneous mix of materials and forms. Some were rather crooked whole elm logs such as timber [989] and [999], whilst others were small oak logs cleft in half, eg [1049].

Some of the piles were clearly reused timbers, such as oak pile [1000], which had been roughly hewn to boxed-heart section and had several relict iron nails in it.

Other oak piles appeared to be off-cuts from preparing larger timbers, eg pile [1003], which was a waste slab still bearing clear pit-saw marks.

One of the larger piles was a rectangular-section oak timber, which after cleaning proved to have been a frame timber from a flat bottomed barge of some kind [772]. It was punctured by oak treenails and iron spikes and similar to other examples found re-used on the Thames at the MoLAS Millenium Bridge South Side site and the AOC Archaeology excavations at Crown Wharf on the Lea, a little to the south. The ship and barge breaking yards around Leamouth would have been a cheap source of such second-hand timber.

Some of the smaller stakes were cut from cream-coloured deciduous wood that was probably local willow, eg [998]. This type of material is not normally found used for such work at this period.

Another interesting reused timber in this group was a box-quartered, sawn oak post with part of a tenoned end preserved and the nails and mortar marks from lath and plaster covering [749]. It is quite possible that this timber was salvaged from buildings on or close to the site.

Finally, item [1001] proved to be a very decayed oak plank fragment, just possibly remnants of the planking slabs that probably sat atop the pile group. The use of such a mix of raw materials suggests that it was a inexpensively built foundation or boardwalk, built out of what could be cheaply obtained locally.

5.11.3.2 Land-tie assembly

Hard against the west edge of Trench 4 the landward end of a land-tie assembly (back brace) for a revetment that lay to the west was found. It comprised a decayed section of a very knotty oak beam, fitted with a recess to hold a wrought iron land-tie rod. Its location suggests the proximity of the reveted channel frontage between *c* 2.5 to perhaps 6m to the west. Although the timber was oak, the prime tree-ring dating species group, it only had *c* 45 rings and no sapwood, so was not useful for dating.

To the east of the land-tie end lay two irregular east-west linear cuts roughly parallel to a masonry wall to the south. It is perhaps possible that these were the impressions of ground set joists which were still used in some low status structures in the post-medieval period. The discontinuous nature of this evidence implies the previous existence of some form of timber building.

5.11.3.3 Millrace

The channel in Trench 4 interpreted as a millrace was more specifically the area of a mill channel close to or containing the wheel itself: ie the wheel pit. It was timber reveted to prevent scouring around what must have been the base of an undershot mill wheel.

The feature appears to have been between the Tumbling Bay channel and the Temple Mill Stream to the west.

A 5.50m length of the 0.5m wide channel was uncovered. The channel had been partly demolished and was made with largely reused timbers but its original form can be reconstructed.

It was built as a simple timber-framed structure with oak posts with barefaced tenons set into two parallel softwood sill beams *c* 0.70m apart (sills [994] and [1072]). The planking of the channel lining was also of imported softwood and was tangentially sawn and nailed to the inner faces of the posts (eg. plank [1073]). Both of the sill beams as well as a softwood cross beam [1070] had many relict mortise and groove joints. These had clearly been used in timber framed buildings before reuse in the mill race. Again, the parent buildings may have been from the site or close by. The lifted oak post [1069] was a box- quartered timber with a barefaced tenon and three relict rebates indicating previous use.

Other timbers associated with the mill race include box-quartered elm locating piles, which had relict halving joints cut into them at close intervals eg. [1068]. These timbers derived from some form of heavy grating such as those used over large ship hatches to let in light and air, or just possibly a grating placed over a mill head race as a debris screen?

5.11.3.4 Fencing/reveting along the west edge of the Tumbling Bay Stream

At least two, possibly three groups of roundwood stake tips were found along the western edge of the north-south Tumbling Bay channel, which was clearly used as a mill feeder channel or leat. They were located part of the way up the bank and probably functioned both as fences and revetments.

Falling into a mill channel was dangerous to both livestock and people, and a fence would also have reduced the debris passing down to the mill. Wattle fences are relatively short lived (10 years on the outside) and need regular replacing. The larger stake tips could possibly have supported a heavier structure such as a post and rail fence.

5.11.3.5 Tree stumps along the east edge of the Tumbling Bay Stream

Over the last few years it has become increasingly apparent that trees were often planted or allowed to grow along the banks of watercourses in the London area in post-medieval times and earlier. Both archaeological evidence of waterlogged stumps and explicit documentary sources (for N Southwark) show that these were often willows managed by pollarding or coppicing.

Three slightly decayed stumps were found on the crest of the east bank of the Tumbling Bay Stream. The general character of the wood suggests willow, poplar or another tree suited to wetlands and their setting suggests deliberate planting. The

branch and stem wood of such trees can provide regular supplies of firewood, wattle fencing material and basketry stems. The root mass helps to prevent bank erosion. Willow was also the source of salicin, a mild analgesic virtually identical to aspirin.

Pollarded and coppiced willows can still be seen in English wetlands and are universal in many wetland areas in N France and the Low Countries.

5.11.4 Key historic woodwork from Period 5

5.11.4.1 Timber associated with the cottages

Although no timber associated with the cottages survived intact, decayed remnants and impressions in mortar deposits survived, indicating some constructional details of the demolished buildings above the level of the footings. It has become clear that the buildings sitting on the brick footings had oak sills and were timber framed structures, probably with mainly softwood frames clad in weather board and or lath and plaster.

5.11.4.2 Casks

Other woodwork in period included four casks reused as small tanks and set in the ground.

The remains of these occurred quite high in the sequence and were very decayed and not lifted. However, four timbers from cask [180] were sampled, three being narrow radially faced cask staves with fragments of iron hoops attached. The other timber was a narrow, tangentially faced piece of oak with bevelled edges and pierced by several small ferrous nails. This may have been a batten to hold cask heading boards together.

5.11.4.3 Pos holes

To the east of the row of cottages several groups of post and stake holes were excavated and have been attributed to this Phase. Some of the holes contained decayed remnants of timber and roundwood but none of the material was lifted. The evidence of a multitude of earth fast stakes and posts may be vestiges of some form of drying rack structures or parts of several short lived outhouses associated with the textile works.

5.11.5 Key historic woodwork from Period 6

The woodwork of this period consisted of a solidly-built timber revetment ([33]=[81]) on the west side of the Tumbling Bay Stream.

This comprised *c* 100mm-thick vertically-driven softwood (of imported types) planks or staves, retained using a system of land-ties. The land-tie assembly made use of strong industrially-produced iron rods. For the period these were cheaper than wood. The tie rods resembled those used in buildings and were bolted to now decayed softwood anchor beams at their west ends and a wale timber at their eastern ends. The tie-rods were fastened in pairs to the anchor beams at *c* 2m centres. There are some similarities with a softwood revetment with iron rod ties used in the mid 19th-century phase of the Waterworks River mill investigated by MoLAS at 150 Stratford High Street recently.

The exclusive use of manufactured and imported materials contrasts greatly with the use of local and regional timber found in the earliest structures at the site.

5.11.6 Recommendations

Further study will throw more light on how the Temple Mills sites was used. A targeted analysis will facilitate our understanding of changes in waterfront woodworking between medieval times and the 19th century, changes in tidal regimes and exploitation of local woodlands. It has also yielded early examples of the use of imported softwoods in timber framed building in the region (reused in the mill race) which should therefore be more fully considered.

It is recommended the millrace structure form Period 3 is compared with similar structures found associated with mills investigated in N Southwark and elsewhere. Already some similarities with 16th to 17th century channels found on Hays Wharf for example are obvious. The earliest use of imported softwood timber used for structural woodwork identified to date in London, pertains to the later 16th century and was found at Hays Wharf and the Globe Theatre in Southwark. It becomes more common being employed alongside elm, and reused oak in the late 17th century. The woodworking details and raw materials of the Temple Mills mill race fit well with a date in the late 17th to early 18th centuries.

During the analysis phase comparisons should be made with other mill-associated timber structures in the region. The detail, range and variety of reused woodwork found should be described and analysed. This will facilitate a better understanding of the buildings which once stood on, or close to, the site. Following completion of the wood species ID work, it will also be possible to more fully characterise the materials used and catch a glimpse of historic wet and dry land woodland in the region.

The assistance of a moulinologist with respect to the analysis of the milling aspects of the site is essential to more fully reconstruct the nature and use of the mill structures. To fully understand the role of the waterfront structures as a whole at this nodal point in the lower Lea, key OD levels such as those of the cobbled road surface, pavements, revetment tops and mill race channel bases should be compared and contrasted with the contemporaneous levels known from elsewhere in the lower Lea to Leamouth/Greenwich area. Several Olympic sites, and others immediately adjacent, with timber waterfront structures have provided much new evidence for relative river level changes such that a major revision of the accepted models of changing tidal levels will now be possible. Clearly this also involves the use of geoarchaeological findings, and is a crucial line of analysis for the study of milling and navigation on the Lea Valley watercourses project wide.

5.12 Environmental samples and geoarchaeological records

Graham Spurr

Several visits were made by a MoLAS-PCA geoarchaeologist to examine, record and sample the natural sequence exposed across the trench PDZ1.12. A sequence of Monolith tins was taken from sections exposed in the trench and a series of bulk

samples was also taken adjacent to the Monolith tins to provide sediment of off-site examination.

The results of the Monolith associated assessments are included in this section (below). Archaeological features, where excavated, were also sampled with bulks and/or monoliths as appropriate. The results of the bulk sample associated assessments are included under the Assessment of the Environmental Evidence section below.

5.12.1 Assessment of environmental evidence

Environmental bulk soil samples were collected for the potential recovery of macro-biological remains, and information on the character of the local environment and possible evidence of human activities in the area. These samples were taken from a number of features, with several being collected in association with monolith tins sampled through the sedimentary and soil sequences within the trench. Information from the macro-biological remains could compliment the potential ecological data from micro-environmental material contained within these monoliths and possibly establish spatial and temporal changes in the character of the environment on both a local and regional scale.

The aim of the assessment was to establish the level of preservation, the frequency and species-diversity of any environmental remains, and the potential for further work.

5.12.1.1 Plant macrofossils

John Giorgi

5.12.1.1.1 INTRODUCTION

The aim of the assessment was to establish the level of preservation, the frequency and species-diversity of any environmental remains, and the potential for further work. The following assessment is concerned primarily with the botanical remains although reference shall be made to other biological material within the samples, for which separate assessments, in some instances, are being carried out

5.12.1.1.2 RESULTS

A total of 31 samples from 29 contexts were selected for assessment. These samples were collected from sedimentary/soil deposits and the fills of various man-made features.

Sampled sedimentary/soil deposits consisted of nine samples from silt, sand and clay layers, four from peaty sandy and clay deposits and six from alluvial layers. Ten of these bulk samples were collected from sedimentary/soil deposits adjacent to and in association with three monolith sequences in Trench 3; one bulk sample from alluvium [833] in association with monolith sample <26>; four bulk samples from sandy clay [830], alluvium [827] and sandy clay [845] adjacent to monolith <28>; and five bulk samples from sand [842], peaty clay [837], alluvium [838] and silty clay [281], taken in association with monolith samples <2>, <3> and <30>, which made up a continuous sedimentary sequence. Seven samples were taken from ditch, drain, pit, post-hole, revetment and barrel fills. Another two samples were collected from a possible industrial waste deposit and a sooty layer, while three samples were taken from undefined layers and fills.

The samples were from features associated with four phases of the site, dating from the early Holocene through to the end of the Victorian period. Initial spot-dating and radio-carbon dating of material from deposits within these phases has shown very broad date ranges for each phase.

Period 1 represents the natural drift geology across the site, with dates from different contexts producing a range from 11,180 BC to 2150 BC; three samples were taken from this phase. Thirteen samples were collected from Period 2, which represents alluvial deposition across the site (with deposits of sands, peat and clay layers) which started in the Mesolithic period and continued into the historical period, with a broad date range of 2460 BC to 1225 AD. Period 3 represents the draining of the marsh (probably beginning in the medieval period) and the creation of a dry land environment suitable for industrial development. Ten samples were collected from deposits associated with this phase, with material from samples giving a date range of 160 BC to 1650 AD. One sample was collected from Period 5, a period of redevelopment of the area in the late 18th century and into the middle of the 19th century, while Period 6 (1820 to 1900 AD) with four samples includes building demolition and further redevelopment of the site.

The size of all the individual samples was 20 litres. Nine litres from each sample was processed by flotation onto a 0.25mm sieve, followed by wet-sieving of the residue through a 0.5mm sieve. One litre subsamples were taken from each sample for processing for ostracods by wet-sieving through a 0.25mm sieve. A further two litres was processed for insect assessment from selected samples leaving at least eight litres of soil retained from every sample for possible further processing and the recovery of additional biological remains. Information on the sampled contexts (including date, phase and context type) and processing details is shown in Table 1.

The flotation residues were dried and sorted for biological remains. All 31 samples produced flots with 26 containing potential waterlogged plant remains, which were kept wet to limit deterioration of organic materials; the other five flots were dried. Flot size ranged from three to 500ml, with 20 being greater than 40ml and ten being in excess of 100ml. Only part of the larger flots from 23 samples was scanned for the assessment.

Each flot was divided using a stack of sieves and the remains scanned using a binocular microscope. Item frequency and species diversity of all biological material was recorded using the following rating system of 1 to 3.

Frequency: 1 = 1-10 items; 2 = 11-50 items; 3 = 50+ items
Diversity: 1 = 1-4 species; 2 = 5-7 species: 3 = 7+ species

Context	Sample	Phase	C14 date	Wood	Seed	Roots	Wood	Other	Comments
842	27	1	BC 2460-2150	2 1	3 3	3 1	3 1	1 1	Good seed assemblage (wet, disturbed, woodland spp.); mod nos molluscs (30-60); some beetles (10-30); >fragments wood; 25% flot <2mm scanned
830	23	1				2 1	3 1		Virtually al fragmented wood; some roots; 25% flot scanned
830	34	1	BC 11,180-10,930		1 1	3 1	3 1		Mainly very fragmented wood; 50% flot>1mm scanned; 25%<1mm flot scanned
1006	51	2			1 1	3 1	2 1		Mainly roots; some fragmented mollusc shell
270	4	2	AD 670-890	2 1	3 3		3 1		Mod rich seed assemblage (wet & dist/waste gd);moderate nos beetles & molluscs (mainly fragments); 50% <1mm flot scanned
1007	52	2			3 3	3 1	3 1		>seeds(wet including aquatic & disturbed/waste ground); mod nos beetle fragments;>wood;50% flot<2mm scanned
1008	53	2			3 3		3 1	1 1	>seeds (et including aquatic & disturbed/waste ground); good beetle assemblage; only 50% flot <2mm scanned
1005	50	2			1 1	1 1	1 1		Mainly fine gravel
838	40	2			3 3	1 1	3 1	2 1	>wood fragments; mod seed assemblage (wetland/disturbed/waste ground); mod nos beetle fragments; 25% flot <2mm scanned
827	35	2	BC 800-540	2 1	3 3	3 1	3 1	1 1	Rich seeds (aquatic & disturbed/waste ground); good insects; 50% of 0.25-0.5mm sieve scanned
845	36	2	AD 240-420	2 1	3 3	3 1	3 1	1 1	Mainly frag wood & good molluscs; mod nos seeds (woodland,wetland,disturbed gd spp); grape; mod nos beetles (30-100); 25% flot <2mm scanned
837	24	2			3 3	3 1	3 1	1 1	>frags wood; mod rich seed assemblage esp wetland (aquatics) & some dist/waste gd & woodland spp; mod rich beetles; 25% flot<1mm scanned
837	29	2	BC 2460-2200	1 1	3 3	3 1	3 1		Good seed assemblage (especially wetland/aquatic spp >ptm); moderate nos beetle frags (30-100)
839	38	2			3 2	1 1	3 1	1 1	Moderate assemblages of seeds (wet/disturbed gd), molluscs (50-100) & beetles; 25% flot <1mm scanned
833	37	2	AD 590-670	2 1	3 3	3 1	3 1	1 1	Rich seed assemblage (disturbed ground); good insects & mod good molluscs; 25% 0.25-0.5mm sieve scanned
836	39	2			3 3	3 1	3 1	2 1	>wood frags;>seeds (wetland (aquatic) & disturbed/waste ground plants; good beetles; c 30 molluscs; 50% flot<1mm scanned
580	20	3		2 1	1 1	2 1	2 1		Mainly roots & very fragmented clinker; occ beetles
394	11	3		2 1			1 1		Virtually all fragmented clinker; 50%>1mm flot scanned; 10%<1mm flot scanned
950	41	3		2 1	3 3		3 1	1 1	Mod rich seeds (disturbed/waste gd & wet (aquatics); mod rich beetles & moderate nos molluscs; 50% flot<1mm scanned
952	42	3		2 1	3 3	3 1	3 1	1 1	>seeds -wet (aquatic), disturbed/waste ground plants; good molluscs & beetles; >wood; 50% flot <2mm scanned
489	15	3				1 1			Virtually all clinker; 25% flot<1mm scanned
515	12	3		2 1		1 1	1 1		Virtually all clinker; 50% <1mm sieve scanned
969	43	3		3 1	1 1				Virtually all fragmented charcoal (some possibly id'ble); little clinker

Context	Sample	Phase	C14 date	Wood	Seed	Roots	Wood	Other	Comments
763	44	3		3 1	1 1	3 1			Mainly very fragmented clinker (large frags); some frag charcoal; moderate nos molluscs but mostly fragments
984	45	3		2 1	1 1	3 1	2 1		Mainly very fragmented clinker; mod nos molluscs (50-100); 25% flot <1mm scanned
281	3	3	BC 160-AD 60	3 1	1 1	2 1	2 1		Molluscs in sandy gravel matrix; 25% flot<1mm scanned
207	13	5			3 2		3 1		Mod nos seeds (mainly sam); good molluscs;>clinker; 25%<1mm sieve scanned
181	1	6		2 1	3 2	3 1	3 1		Mod seeds & spp diversity (>sam);>wood; moderate beetles
534	17	6				1 1	1 1		Virtually all clinker
546	18	6		2 1	2 1	3 1	3 1		Virtually all clinker; some roots, small wood fragments; occ seeds; 25% flot scanned
214	27	6		3 1	1 1	3 1	2 1		Mainly v fragmented clinker;some charcoal & roots; 50% 0.25-0.5mm sieve scanned

Table 21: Plant macrofossil remains

Charred plant remains

Charred plant material was limited to variable but generally small amounts of very fragmented charcoal, recorded in 18 flots, with a breakdown by phase being as follows; Period 1 (one sample), Period 2 (five samples), Period 3 (nine samples) and Period 6 (three samples). Nine of these samples contained a few potentially identifiable fragments; in three samples from Period 2 (from alluvial deposits [270] sample <4> and [833] sample <37>, and sandy clay [845] sample <36>); in four samples from Period 3 (from a pit fill [969] sample <43>, layer [984] sample <45>, clay [763] sample <44> and silt clay [281] sample <3>); and in two samples from Period 6 (from a barrel fill [181] sample <1> and revetment fill [214] sample <27>).

Waterlogged plant remains

Waterlogged plant remains were preserved in virtually all (30 of the 31) samples with a wide range of material being present in the flots. There were identifiable fruits and seeds in 26 flots and mostly very fragmented wood in 28 samples, including round wood/twig fragments. Occasional large wood fragments (up to 80mm in length) were noted in two samples, from sandy clay [830] (sample <23>) and peaty clay [837] (sample <24>).

Other plant material included small numbers of buds in five samples with a moderate amount in [838] sample <40>. Alder (*Alnus glutinosa*) catkins were noted in [842] (sample <27>), with occasional leaf fragments in two samples (from alluvium deposits [827] and [838]), and a few thorn fragments from ditch fill [952] (sample <42>), Small amounts of moss were present in seven flots, while 24 of the sampled features contained variable amounts of rootlets.

Identifiable seeds and fruits were present in small amounts in nine samples, with a moderate number of seeds in one flot and a high seed frequency in 16 samples, with moderate species diversity in three flots (samples <1>, <13>, <38>) and high species diversity in 13 flots, (samples <4>, <24>, <27> (of [842]), <29>, <35>, <36>, <37>, <39>, <40>, <41>, <42>, <52> and <53>). A breakdown of the rich samples by phase was as follows; Period 1 (one sample), Period 2 (11 samples), Period 3 (two samples), Period 5 (one sample) and Period 6 (one sample).

The waterlogged seeds and fruits in the samples were mainly from weeds/wild plants associated with a number of habitats but predominantly wetland (bankside/marshland) environments and disturbed (including cultivated) ground and waste place habitats; there was some evidence for woodland/hedgerow/scrub and possibly grassland environments.

There was a very wide range of wetland plants represented in the samples with aquatics, for example stoneworts (*Chara* spp.) and pondweeds (*Potamogeton* spp.), plus a large number of species that may be found in various wetland habitats, in rivers, ponds, lakes, ditches, marshes and fens; these included crowfoots (*Ranunculus Batrachium*), celery-leaved crowfoot (*R. sceleratus*), water-cress (*Rorippa nasturtium-aquaticum*), water dropworts (*Oenanthe* spp.), marshworts (*Apium* spp.), gypsy-wort (*Lycopus europaeus*), water plantain (*Alisma* spp.), horned pond weed (*Zanichellia palustris*), branched bur-reed (*Sparganium erectum*), spike-rushes (*Eleocharis* spp.), sedges (*Carex* spp.) and rushes (*Juncus* spp.).

There were the remains of a similarly large number of wild plants found in disturbed ground and waste places; these included chickweeds (*Stellaria media*), stinging nettle

(*Urtica dioca*), knotgrass (*Polygonum aviculare*), goosefoots (*Chenopodium* spp.), oraches (*Atriplex* spp.), sun spurge (*Euphorbia helioscopia*), petty spurge (*E. peplus*), docks (*Rumex* spp), black nightshade (*Solanum nigrum*), sow-thistles (*Sonchus* spp.) dandelions (*Taraxacum* spp.) and corn marigold (*Chrysanthemum segetum*). A number of these species may have been growing as arable weeds while some, for example chickweeds, knotgrass and stinging nettle, are indicative of nitrogen rich soils.

A small range of plants associated with woodland/hedgerow/scrub environments were represented in some of the samples, with the remains of elder (*Sambucus nigra*), blackberry/raspberry (*Rubus fruticosus/idaeus*) and plum/bullace (*Prunus domestica*), all of which are potential sources of wild fruit, and alder, a tree found in damp, woods and by lakes and rivers (Stace 2005). Some of the bud, thorn and leaf fragments noted in several samples and the variable amounts of fragmented wood in 28 samples (including round wood/twig fragments) may belong to some of these plants.

Several samples contained very occasional remains of cultivated fruits with evidence for grape (*Vitis vinifera*) in sandy clay layer [845] (sample <36>) and a very tentative identification of this fruit in a possible Neolithic (Period 1) sandy deposit [842] (sample <27>). There was also tentative evidence for fig (cf *Ficus carica*) in a Period 3 post hole fill [580] (sample <20>).

A number of plants represented in some of the samples may point to the presence of grassland/wet meadow habitats, with seed remains of self heal (*Prunella vulgaris*), buttercups (*Ranunculus* spp.), sedges, rushes and grasses *(Poaceae indet*).

A breakdown of the waterlogged seed assemblages by phase shows that two samples from Period 1 contained seed remains, with rich plant remains in Neolithic sand layer [842] (sample <27>) producing evidence of wetland, disturbed/waste ground and woodland plants. The other productive sample from early Holocene sandy clay layer [830] (sample <34>) only contained a few seeds.

Eleven of 13 samples from Period 2 deposits produced rich seed assemblages, with a good representation of wetland plants in two samples (<24> and <29>) from Neolithic peaty clay [837], wetland and disturbed/waste ground species in late prehistoric alluvial deposit [827] (sample <35>), woodland, wetland and disturbed/waste ground plants in late Roman sandy clay layer [845] (sample <36>), and wetland and disturbed/waste ground species in samples <4> and <37> from Saxon alluvial deposits [270] and [833] respectively. Other rich seed assemblages from Period 2 were from peaty clay layer [1007] (sample <52>), peaty sand layer [1008] (sample <53>), gravel and sand deposit [836] (sample <39>), sandy clay layer [839] (sample <38>) and alluvial deposit [838] (sample <40>), all of which contained evidence mainly for wetland and disturbed/waste ground plants.

Two of seven samples from Period 3 produced good waterlogged seed assemblages, from ditch fills [950] (sample <41>) and [952] (sample <42>), with the seed remains of mostly wetland and disturbed/waste ground species. Period 5 produced one moderately rich seed assemblage containing mainly elder seeds from drain fill [207] (sample <13>), while three samples from Period 6 produced 'waterlogged' seed remains, with the sampled barrel fill [181] yielding a fairly large number of seeds albeit mostly from elder.

5.12.1.1.3 SUMMARY AND GENERAL DISCUSSION

Botanical remains in the samples were preserved mainly by waterlogging with the only charred material being small amounts of very fragmented charcoal in 18 flots, including a few potentially identifiable fragments in nine samples; in three samples from Period 2; in four samples from Period 3; and in two samples from Period 6.

Waterlogged botanical assemblages (fruits and seeds) were present in 26 flots with high seed frequencies and moderate to high species diversity of identifiable remains in 16 samples, mainly from Period 2 which contained 11 rich samples, with the other rich samples being from Period 1 (one sample), Period 3 (two samples), and Phases 5 and 6 (one sample each). The material was virtually all from wild plants, mostly associated with wetland and disturbed/waste ground habitats but with some evidence for woodland environments in occasional samples from Period 1 and Period 2, and some evidence for grassland habitats in a few samples. There were also variable amounts of fragmented wood in 28 samples. Occasional seed remains of cultivated fruits were noted, with grape in a late Roman context (Period 2) and a tentative identification of this fruit in an earlier deposit, and fig in a sample from Period 3.

5.12.1.1.4 RECOMMENDATIONS

Soil retained from all samples that produced rich 'waterlogged' assemblages and good insect and mollusc remains may be processed to potentially increase species diversity and provide additional information on environmental conditions and possibly human activities in the area.

The soil from some of the samples may need to be divided beforehand for the retrieval of the different types of biological remains. Of the 16 samples that produced good waterlogged seed assemblages, 14 of these samples (<1>, <4>, <24>, <29>, <35>, <36>, <37>, <38>, <39>, <40>, <41>, <42> <52>, <53>) contained rich insect assemblages; thus, the remaining soil from these samples needs to be divided before processing with the insects being recovered by paraffin flotation.

Five samples (<13><36><37><38> and <42>) with rich waterlogged plant assemblages also contained large numbers of molluscs although both types of material can be recovered using the same process by wet-sieving the sample to 0.25mm. The remaining soil from sample <27> from [214] (Period 6) should be divided before processing for the separate recovery of insects and molluscs.

All the remaining soil from sand layer [842] (sample <27>), may be used for the recovery of plant remains, while the rest of the soil from the early Holocene deposit from sandy clay layer [830] (sample <34>) should also be processed despite producing few identifiable remains in the initial assessment given the early date of this context. The remaining soil from sample <12> should be used for insects, while the rest of the soil from samples <3>, <44> and <45> should be processed for the recovery of molluscs.

5.12.1.2 Insects

Enid Alison

5.12.1.2.1 METHODOLOGY

Eighteen sub-samples with individual volumes of 2 litres were washed to 0.3mm by MoLAS and submitted for assessment of insect remains. Sub-samples were processed by paraffin flotation to extract insect remains following the methods described by Kenward *et al*. (1980, 1986) with flots recovered on 0.3mm mesh. Flots were scanned

for the presence of insects and other invertebrates using a low-power binocular microscope (x10 – x50). Abundances of various groups were estimated, and the state of preservation assessed. Nomenclature for Coleoptera follows Duff (2008), and for Hemiptera (Kloet and Hincks 1966-77).

The flots are currently stored in industrial methylated spirits in plastic jars.

5.12.1.2.2 RESULTS

The insect assessment results are listed by period.

Period 1

Context [830], sample <23>. Sandy clay. The flot (volume ~10ml) consisted almost entirely of fine roots. No insect remains were recovered.

Context [830], sample <34>. Sandy clay. The flot (volume ~20ml) consisted predominantly of fine roots. No insect remains were recovered.

Context [842], sample <27>. Coarse sand with frequent small rounded flint pebbles. The flot had a volume of ~15ml. It contained a small beetle and bug assemblage (estimated 20 individuals), ostracods and several water snails. The insect remains were highly fragmented but individual fragments showed little sign of erosion. Aquatics were relatively well represented and included *Hydrobius fuscipes*, *Laccobius*, *Ochthebius* and *Helophorus*. Other taxa were from terrestrial habitats and have the potential to provide data on the local environment. Processing a further quantity of sediment is recommended to produce a larger assemblage for analysis.

Period 2

Context [270], sample <4>. Alluvium. The small flot (~10ml) produced a reasonably well preserved beetle assemblage (estimated 25 beetles). Ostracods and a larval case of a caddis fly (*Trichoptera*) were recovered indicating aquatic deposition. Aquatic beetles included several *Oulimnius* a riffle beetle (*Elmidae*) found in clean, clear running water. Although the assemblage is small and few conclusions can be drawn at this stage, decomposer taxa were subjectively quite common. *Chaetocnema concinna* found chiefly on *Polygonum* and also docks (*Rumex*) provided an indication of local weedy vegetation. Processing of a further quantity of sediment and a detailed analysis are recommended.

Context [833], sample <37>. Alluvium. The flot had a volume of ~30ml. Insect remains were common (estimated 50 individuals). Preservation was generally good, but a few sclerites were encrusted by a white deposit obscuring identifiable features. Water beetles were common, as were ostracods, and aquatic deposition is indicated. Aquatic beetles included a riffle beetle (Elmidae) found only in clean, clear running water. Closer identification of other aquatic taxa may provide further details of water conditions. Damp ground and waterside taxa included *Platystethus cornutus* group and donaciine leaf beetles found on emergent and waterside vegetation. *Aphodius* and *Cryptopleurum minutum* provided indications of foul organic material, perhaps dung, nearby. Ground beetles and plant feeding insects have the potential to provide information on local ground conditions and vegetation. The assemblage is not particularly large so processing of a further quantity of sediment is recommended before carrying out a detailed analysis.

Context [836], sample <39>. Gravel and coarse sand. The flot had a volume of ~15ml and it contained a small but well preserved beetle assemblage (estimated 10 individuals). If interpretable data is to be obtained a much greater amount of sediment (in the order of 50 – 20 litres, if available) will need to be processed. This will considerably increase the time necessary for processing and the size of the flot produced, and consequently the time to sort through it to extract insect material. Further work is therefore recommended only if there is a particular reason for investigating this deposit.

Context [837], sample <24>. Peaty clay. A flot with a volume of 30ml was produced. It contained a rich assemblage of well preserved insect remains (estimated 100 individuals). Water beetles were particularly well represented and included *Hydrochara caraboides* which generally breeds in pools and ditches with a floating raft of densely matted vegetation at their centre, and an area of shallow, open water with isolated stands of emergent vegetation. *Oulimnius* suggests that there was an input of material from running water. Phytophages found on aquatic and waterside vegetation and on plants of drier land were represented. The latter included *Chaetocnema concinna* found chiefly on *Polygonum* and docks (*Rumex*). *Geotrupes* and *Onthophagus* indicate the presence of dung, and therefore probably grazing animals in the vicinity.

Further analysis is recommended. Although the assemblage is reasonably large, processing of a further 2 litres of sediment will provide greater resolution on local habitat types.

Context [837], sample <29>. Peaty clay. A flot with a volume of ~20ml was produced. An assemblage of 30 – 50 very well preserved beetles and bugs was recovered. Aquatic deposition was indicated by a group of water beetles and bugs, remains of caddis flies (Trichoptera) and ostracods. Aquatic beetles included species from both running water (*Esolus parallellepipedus*) and stagnant water habitats. Plant feeders and ground beetles have the potential to provide data on local terrestrial conditions. Processing of more sediment and a detailed analysis of the resulting assemblage is recommended.

Context [838], sample <40>. Alluvium. The flot had a volume of ~30ml. An assemblage of ~50 well preserved beetles and bugs was recovered. Aquatic insects were relatively common, and ostracods and water flea ephippia (*Cladocera*: resting eggs) were also present indicating that the deposit was waterlain. Water beetles included taxa found in clear running water (Elmidae) together with others, such as *Hydraena testacea*, found in stagnant conditions. Beetles from wet ground and waterside habitats included *Dryops* found in wet mud, and *Prasocuris phellandrii* found on waterside umbellifers. Processing of more sediment and a detailed analysis is recommended.

Context [839], sample <38>. Sandy clay. Insect remains were common in the flot (volume ~20ml). An assemblage of ~50 well preserved beetles and bugs was recovered. Aquatic insects and ostracods were common indicating that the deposit was waterlain and the water beetles included several *Oulimnius* found only in running water. Terrestrial insects were well represented and have the potential to provide details on local vegetation. Stands of neetles (*Urtica*) were indicated by nymphs of *Trioza urticae*. Further processing is recommended before carrying out a detailed analysis.

Context [845], sample <36>. Sandy clay. The flot had a volume of 15ml and it contained a small assemblage (~30 individuals) of well preserved beetles and bugs. Aquatic insects and ostracods were common indicating aquatic deposition. Plant feeders were well represented and have the potential to provided data on local vegetation. Processing of more material is recommended to provide a larger assemblage for analysis.

Context [1006], sample <51>. Alluvium. The flot had a volume of ~20 ml and consisted mainly of fine roots. There were occasional small scraps of insect cuticle.

Context [1007], sample <52>. Peaty sand. A flot with a volume of ~10ml was produced. It contained a small well preserved assemblage of insect remains (estimated 25 beetles). Aquatic, waterside and terrestrial taxa were represented. There were several *Dryops* found in wet waterside mud. Dung beetles (*Aphodius*) and *Phyllopertha horticola* suggest grazing of poor quality grassland in the vicinity but a larger assemblage would be required to provide better data. Processing of a large quantity of sediment is recommended to produce a larger assemblage for detailed analysis.

Context [1008], sample <53>. Peaty sand. The flot had a volume of ~30ml and contained a well preserved assemblage of around 50 beetles. Aquatic and waterside taxa were well represented. *Oulimnius* indicates an input of material from running water. There were several species of donaciine leaf beetles found on emergent and waterside vegetation (*Donacia* spp., *Plateumaris*), and *Limnobaris* a weevil found on sedges (*Carex*). Beetles associated with foul organic material were common (*Aphodius* spp., *Geotrupes* and *Platystethus arenarius*), their relative abundance probably pointing to the presence of grazing animals nearby. Poor quality grassland is indicated by *Phyllopertha horticola*. Processing of more sediment and a detailed analysis is recommended.

Period 3

Context [394], sample <11>. Organic layer. Although the deposit was described as being an organic layer the sample submitted contained only very small quantities of biological material. The very small flot (<5ml) consisted mainly of coal/clinker fragments with occasional small pieces of slag. No insect remains were recovered.

Context [515], sample <12>. Sooty deposit. The very small flot (volume <5ml>) consisted mainly of small fragments of coal/tarry concretions, slag and hammerscale. A very small quantity of plant material was recovered but no insect remains.

Context [952], sample <42>. Fill of ditch/mill race, cut [615].The flot had a volume of ~20ml. It contained an excellently preserved beetle assemblage (estimated 20 individuals. They included a riffle beetle indicating an input of clean, clear running water. Woodworm beetle (*Anobium punctatum*) may have come from the timber lining of the cut, or possibly from other structural timber nearby, although they are also found in natural situations. About half of the assemblage consisted of weevils (*Curculionidae*), presumably derived from vegetation growing near to the ditch/mill race. Further analysis will provide more detailed information in this regard. Other noteworthy taxa were several ground beetles (*Carabidae*), *Megasternum concinnum*, and *Onthophagus*. The last beetle is found in and around dung. Further processing is recommended to provide a larger assemblage for detailed analysis.

Period 6

Context [546], sample <18>. Sandy silt. The small flot (~10ml) produced a small insect assemblage with approximately 15 individuals. The remains were fragmentary but otherwise well preserved. The assemblage was notable because it consisted mainly of decomposers including several typically synanthropic taxa, specifically a fauna that may be associated with buildings or refuse derived from buildings. The assemblage is very small and processing of a further quantity of sediment is recommended if detailed analysis is to be carried out.

5.12.1.2.3 CONCLUSIONS AND RECOMMENDATIONS

The majority of the samples examined contained insect remains in a good to excellent state of preservation which have a high potential for reconstruction of local environmental conditions along the valley floor of the River Lea throughout the period represented by the deposits. Concentration of remains was fairly low in most of the samples however, and processing of a greater quantity of sediment is recommended to provide larger assemblages that will provide greater resolution of environmental data.

It is recommended that a further quantity of sediment is processed from the following thirteen samples to increase the sizes of the insect assemblages recovered. Detailed analysis of the samples should then be carried out. The amounts of sediment suggested for further processing are likely to produce beetle and bug assemblages with 100 – 200 individuals.

Context	**Sample**	**Volume of extra sediment**
270	<4>	10 – 15 litres
546	<18>	10 – 15 litres
833	<37>	4 litres
836	<39>	15 – 20 litres
837	<24>	2 litres
837	<29>	6 litres
838	<40>	6 litres
839	<38>	8 litres
842	<27>	10 litres
845	<36>	10 litres
952	<42>	10– 5 litres
1007	<52>	10 litres
1008	<53>	4 litres

Table 22 Sediments recommended for further processing for recovery of beetle and bug assemblages

Insect remains were in a low concentration in [836] and further work may be relatively time consuming for the amount of information eventually obtained (see above in results section). Further work is therefore recommended only if there is a particular reason for investigating this deposit. No further action is required for the remaining samples as far as insect remains are concerned.

5.12.1.3 Mollusc remains

Alan Pipe

5.12.1.3.1 INTRODUCTION

This report identifies, quantifies and interprets the invertebrate remains from wet-sieved samples [181] <1>–[1008] <53>. Each sample group was inspected, using a low-power binocular microscope, for foraminiferid tests, crustacean exoskeleton and mollusc shells and then recorded in terms of species-diversity, shell count and preservation. With the exception of the economically important marine/estuarine and visually distinctive terrestrial and freshwater molluscs, no attempt was made at identification to species-level.

5.12.1.3.2 RESULTS

Marine/estuarine molluscs, mainly common/flat oyster *Ostrea edulis*, were recovered in very small numbers. Samples [207] <13>, [214] <27], [270] <4> and [836] <39> produced single shells of common/flat oyster; sample [207] <13> produced a single shell of common periwinkle *Littorina littorea*. A shell of an unidentified snail was recovered from sample [950] <41>. The oyster shells were fragmented and in variable preservation with no identifiable encrusting flora or fauna.

Very small numbers of ubiquitous moisture- and shade-loving snails were recovered. These mainly derived from single shells of common/garden snail *Helix aspersa* [207] <13>, rounded/radiated snail *Discus rotundatus* [207] <13>, blind/agate snail *Cecilioides acicula* [181] <1> and door snail *Clausiliidae* [952] <42>. Sample [827] <35> produced approximately ten shells of an unidentified snail species (snail sp.1).

Freshwater mollusc shells provided the bulk of the invertebrate assemblage, >1700 shells. These derived from roughly equal numbers of river nerite *Theodoxus fluviatilis*, bithynia *Bithynia sp.*, pond snails Lymnaeidae, valve snail *Valvata sp.,* ram's-horn snails *Planorbidae* (at least three species, Planorbidae sp. 1-3) and at least one species of small bivalve (bivalve sp. 1). All shells were in moderately good condition and identifiable to species level.

No fragments of crustacean exoskeleton were recovered. No foraminiferid tests were recovered. See the results in Table 23 below.

CONTEXT	SAMPLE	F/W MOLLUSCA	MARINE MOLLUSCA	TERR. MOLLUSCA	NOS.	PRESERVATION
181	1	Planorbidae sp. 1 Lymnaeidae sp. 1 bivalve sp.1 *Bithynia sp.*			few - med	good
207	13	bivalve sp. 1	*Littorina littorea* *Ostrea edulis*	*Helix aspersa* *Discus rotundatus*	few - med	medium
214	27		*Ostrea edulis*			good
270	4		*Ostrea edulis*		few	poor
281	3	nil	Nil	nil	-	good
763	44	*Theodoxus fluviatilis*			few	good
827	35	*Bithynia sp.*		snail sp. 1	few	good
833	37	*Bithynia sp.;* *Valvata sp.*			few - med	good
836	39	*Bithynia sp.*	*Ostrea edulis*	nil	few	medium
838	40	*Bithynia sp.* Planorbidae sp. 1			med	good
839	38	*Bithynia sp.* ; bivalve sp. 1			med	good
842	27	*Theodoxus fluviatilis;* Lymnaeidae sp.1; bivalve sp. 1; *Theodoxus fluviatilis;* Planorbidae sp. 1; bivalve sp. 1			few-freq	good

CONTEXT	SAMPLE	F/W MOLLUSCA	MARINE MOLLUSCA	TERR. MOLLUSCA	NOS.	PRESERVATION
845	36	*Theodoxus fluviatilis; Valvata sp.;* bivalve sp. 1; *Valvata sp;. Bithynia sp.*			few-freq	good
950	41	*Theodoxus fluviatilis; Bithynia sp;*	Snail sp. 1	Clausiliidae	few	good
952	42	Planorbidae sp. 1&2 Lymnaeidae sp. 1 *Theodoxus fluviatilis* bivalve sp.1 Planorbidae sp. 1& 3 *Bithynia sp.*			few-freq	good
952	42	bivalve sp. 1			100	good
1008	53	*Bithynia sp.* Planorbidae sp. 1			few-freq	good

Table 23: Wet sieved invertebrate remains.

5.12.1.3.3 CONCLUSION AND RECOMMENDATIONS

There was no recovery of foraminiferids or crustaceans.
The assemblage of economically important marine bivalve mollusc species, common/flat oyster and common mussel, is too small to merit further metrical or quantitative study. The absence of encrusting flora or fauna also eliminates any potential for ecological interpretation of the source fishery.

The relatively large freshwater mollusc assemblage derives from at least eight species; it has definite potential for further post-assessment study in that it includes at least three groups; bivalves, ram's-horn snails Planorbidae and pond snails Lymnaeidae showing *inter-specific* variation in habitat requirements. Further identification of these groups to provide a more complete list of species should allow some comment on the characteristics of the local freshwater habitat in terms of a range of physical (substrate, water movement and seasonality), chemical (pollution and salinity) and ecological (vegetation) parameters. Identification of each species may also allow some comment on other potential source materials, e.g. flooring or roofing, responsible for their presence in the deposit.

The small identified assemblage of terrestrial molluscs derives from species ubiquitous throughout SE England in moist, shaded habitats. Further work has little potential to define local ecological conditions.

5.12.2 Assessment of the geoarchaeological evidence

Four monolith sample sequences were taken across the site as well as an gouge auger sample. Each monolith tin was plotted on the section drawing and related to Ordnance Datum (OD) by the supervising archaeologist. The monolith tins were then sealed and together with the bulk samples were transported to the MoLAS Environmental laboratories.

5.12.2.1 Sediments

The description of the monolith sample sequences are tabulated as follows, with monoliths <2>, <3> and <30> along with the gouge auger sample of deep level deposits amalgamated as one in Table 26. See Fig 13 for locations of <26>, <28> and <30>.

Elevation and thickness of unit	***Trench:PDZ6.01 Monolith Sample: <26> Sedimentary description***	***Context***	***Microfossil subsamples***
+2.45mOD to+2.34mOD	Medium brown SILTY CLAY with lenses/laminae of silty sand especially at the base of the unit where it is firmer. Top of the unit is fairly friable with occasional fine-medium gravel, CERAMIC BUILDING MATERIAL, whole gastropod & bivalves and shell fragments. Rare chalk fragments and occasional Mn/charcoal flecks. Boundary is clear and horizontal.	833/839	Pollen, Diatom, Ostracod &AMS: 2.45mOD Pollen, Diatom 2.25mOD
+2.34mODto +2.15mOD	Pale yellowy brown SANDY GRAVEL, poorly consolidated, poorly sorted with medium-coarse sandy matrix. Gravel fine-very coarse (large pebbles) clasts of subangular to well rounded flint with occasional to moderate chalk fragments, shell fragments and occasional wood fragments. Very friable unit. Boundary is clear and horizontal.	836	
+2.15mOD to +2.05mOD	Organic dark brown SILTY CLAY with moderate wood fragments and root material. Appears to exhibit laminations especially at the base.	838	Pollen, Diatom 2.05mOD Pollen, Diatom, Ostracod &AMS: 1.95mOD

Table 24: Sedimentary description of monolith sample sequence <26>

Elevation and thickness of unit	***Trench:PDZ6.01 Monolith Sample: <28> Sedimentary description***	***Context***	***Microfossil subsamples***
+2.49mOD to+2.29mOD	Firm mid brown SILTY CLAY with rare CERAMIC BUILDING MATERIAL and shell fragments. Exhibits sand lenses/lamina throughout indicating cyclic sedimentation. Occasional Mn speckling throughout, large wood fragment at base of unit. Boundary between units is clear and horizontal.	845	Pollen, Diatom, Ostracod &AMS: 2.49mOD Pollen, Diatom 2.3mOD
+2.29mODto +2.20mOD	Firm paler grey brown SILTY CLAY with occasional Mn specking and sand lenses probably the base of the unit above and thus marks a transitional phase. Rare wood fragments. Boundary between units is clear and horizontal.	827	Pollen, Diatom 2.29mOD Pollen, Diatom, Ostracod &AMS: 2.21mOD
+2.20mOD to +1.35mOD (depth unknown)	Brownish yellow fine SILTY SAND with frequent roots with Fe weathering, occasional large gravel and Mn patches. Some areas are sandier and thus more friable.	830	Pollen, Diatom, Ostracod &AMS: 2mOD

Table 25: Sedimentary description of monolith sample sequence <28>

Elevation and thickness of unit	***Trench:PDZ6.01 Monolith Sample: <2>, <3>,<30> & gouge auger Sedimentary description***	***Context***	***Microfossil subsamples***
+3.53mOD to+3.25mOD	Greyish brown, very gritty SILTY CLAY with occasional whole gastropods and shell fragments. Frequent fine-medium gravel and occasional charcoal/Mn flecks. Moderate chalk flecks. Crumbly in texture facilitated by the grit content grades into smoother firmer silty clay with less gravel and micro lens of Fe stained fine sand. Exhibits a gradational boundary.	281 <2>	Pollen, Diatom, Ostracod &AMS: 3.53mOD Pollen, Diatom 3.35mOD

Elevation and thickness of unit	*Trench:PDZ6.01* *Monolith Sample: <2>, <3>,<30> & gouge auger* *Sedimentary description*	*Context*	*Microfossil subsamples*
+3.25mOD to +2.63mOD	Firm greyish brown SILTY CLAY with moderate sandy lenses/laminations throughout the monolith some of which are Fe stained. Occasional shell fragment and fine-medium gravel. Moderate charcoal/Mn flecks. Some organic plant material especially at base of monolith.	270 <2>&<3>	Pollen, Diatom, Ostracod 3.24mOD Pollen, Diatom, Ostracod &AMS: 3.04mOD Pollen, Diatom 2.91mOD
+2.63mOD to +2.42mOD	VOID		
+2.42mOD to+2.22mOD	Mid brown, firm, organic SILTY CLAY with occasional gastropods (whole and fragments) plant/woody material, Mn speckling throughout the unit. Exhibits some silty/sandy patches and contains some woody material	822 <30>	Pollen, Diatom, Ostracod 2.42mOD & 2.22mOD AMS: 2.42mOD
+2.22mOD to+1.91mOD	Grey brown organic shelly SILTY CLAY, friable in the shelly areas and firmer at the base where it also exhibits grey/brown banding.	838 <30>	Pollen, Diatom 2.10mOD & 1.91mOD
+1. 91mOD to +1.63mOD	Dark brown/black stiff SILTY CLAY with pale grey sand at base. Silty clay contains some organic plant material and sandy lenses including a medium sand with occasional plant material, whole bivalves, gastropods and shell fragments (recorded as [842] between +1.78mOD and +1. 74mOD).	837 and 842 <30>	Pollen, Diatom, Ostracod 1.9mOD, 1.76mOD [842] & 1.64mOD AMS: 1.90mOD and 1.64mOD
+1.63mOD to +1.11mOD	Light brown silty/clayey sand with increasing gravel content	939 <auger>	Pollen, Diatom, Ostracod & AMS: 1.41mOD
+1.44mOD to depth unknown	Subangular to subrounded gravels in coarse yellow sand	940 <auger>	Ostracod: 1.11mOD

Table 26: Sedimentary description of monolith sample sequence <30> and gouge auger sample

Further geoarchaeological analysis on these monolith tins (and to some degree the auger sample) would involve closer sampling and loss on ignition, calcium carbonate and magnetic susceptibility testing along with soil micromorphology. These techniques would help to identify stratigraphic changes more closely throughout the profiles that are invisible to the naked eye. An important example of these stratigraphic changes would be soil profile development which indicates possible land surfaces (and therefore possible periods of occupation).

Moreover, there are similarities with the sediments of this trench and Trench PDZ12.01 (OL-08707), particularly with regards to the pre-Holocene river bank [830] and the nature of the initial Neolithic flood deposits seen particularly in monolith <30>. As these sites occupy the eastern flank of the valley and are connected by the Lea/Waterworks River their relationship should be investigated further through geoarchaeological techniques at the analysis stage.

5.12.2.2 Microfossils

Sub-samples for microfossil assessment including diatoms, ostracods and pollen were taken at selected locations within key sedimentary units of each monolith tin sequence. The aim of assessment was to determine the preservation, presence, abundance and diversity of the microfossils within the profiles and provide valuable information about the evolving past environment (for example, vegetation, water

characteristics, and indirect evidence for human activity, in particular landscape clearance, cultivation and other disturbance), which is likely to be complimentary to the macro-remains from bulk samples.

5.12.2.2.1 DIATOMS

Nigel Cameron

Methodology

Twenty-four sediment sub-samples have been assessed for diatoms. The monoliths, sample depths and sample numbers of the sub-samples assessed for diatoms and the sediment types are shown in Table 27. The samples are in three groups: Monolith <26>; Monolith <28>; Monoliths <2>, <3>, <30> & a gouge auger sub-sample from the same sequence.

Diatom preparation followed standard techniques (Battarbee 1986, Battarbee et al. 2001). Coverslips were made from each sample and fixed in Naphrax for diatom microscopy. A large area of the coverslips on each slide was scanned for diatoms at magnifications of x400 and x1000 under phase contrast illumination.

Diatom floras and taxonomic publications were consulted to assist with diatom identification; these include Hartley *et al.* (1996) and Krammer and Lange-Bertalot (1986-1991). Diatom species' salinity preferences are discussed using the classification data in Denys (1992), Vos and de Wolf (1988, 1993) and the halobian groups of Hustedt (1953, 1957: 199).

Results and discussion

The results of the diatom evaluation are shown in Table 27 below.

Monolith Sample no.	Sample Height (m OD)	Context	Diatom numbers	Quality of preservation	Diversity	Potential for % count	Assemblage type
auger	1.45	939	very low	poor	very low	none	aero non pk assemblage fw halophil
26	2.45	833/839	low	poor	mod	some/low	fw non-pk aero
26	2.25	833/839	mod high	mod	mod	mod	fw halophil
26	2.05	838	low	poor	low	low	fw non-pk
26	1.95	838	low	poor	low	low	fw non-pk
28	2.49	845	low	poor	low	low	fw non-pk
28	2.3	845	low	very poor	low	low	fw non-pk
28	2.29	827	low	very poor	low	low	fw non-pk
28	2.21	827	none	-	-	none	-
28	2.19	830	ex low	very poor	very low	none	aero fw non-pk
28	2	830	none	-	-	none	-
2	3.53	281	ex low	ex poor	ex low	none	aero
2	3.35	281	none	-	-	none	-
2	3.24	270	ex low	poor	one sp.	none	fw non-pk
3	3.04	270	very low	very poor	very low	none	aero benthic
3	2.91	270	low	very poor	low	none	non-pk aero
3	2.61	270	low	mod to poor	mod	some	fw non-pk
30	2.42	822	low	poor	low	none	aero epiphy
30	2.22	822	mod	mod to poor	mod	mod/some	fw epiphy non-pk
30	2.1	838	high	good	high	v good	fw epiphy
30	1.91	838	very low	poor	low	none	non-pk fw
30	1.9	837	none	-	-	none	-
30	1.76	842	none	-	-	none	-
30	1.64	837	none	-	-	none	-

(fw – freshwater, bk – brackish, mar – marine, halophil – halophilous, aero – aerophilous)

Table 27 Summary of diatom evaluation results

Monolith <26>

Diatoms are present in all four samples that were assessed from Monolith <26>. However, with the exception of the lower sample from context [833/839] (2.25 m OD), which has a moderately high number of diatoms, the diatom numbers in the Monolith <26> samples are low and the potential for percentage diatom analysis is low. The epiphyte *Cocconeis placentula* is common or abundant throughout. Other non-planktonic types present are *Amphora libyca, Synedra ulna*, *Gomphonema angustatum* and in addition benthic, mud-surface, diatoms such as *Navicula bacillum, Navicula elginensis, Gyrosigma acuminatum and Gyrosigma attenuatum*. Planktonic, open water diatoms, were absent from the assessment counts. The occurrence of the mesohalobous species *Lyrella pygmaea* and the halophiles *Rhoicosphaenia curvata* and *Gomphonema olivaceum* in the lower sample from [833/839] (2.25mOD) suggests that there were increased levels of dissolved salts. Aerophilic diatoms are uncommon (e.g. *Ellerbeckia arenaria* and *Pinnularia major* are present in small numbers in the upper sample from [833/839] (2.45mOD) although chrysophyte cysts, that are often associated with variations in water level for example, were recorded in all four samples. Overall, only the lower sample from context [833/839] from Monolith <26> has (moderate) potential for further analysis.

Monolith <28>

Six samples were assessed for diatoms from Monolith <28>. Diatoms are absent from lower samples from contexts [827] and [830], and upper sample from context [830] has an extremely low number of diatoms present and this sample has no potential for further analysis. Both samples from [845] and the upper sample from [827] (2.29mOD) have low diatom numbers, the quality of valve preservation is poor or very poor valve and the diatom species are of low diversity. The diatom assemblages from [845] and [827] (2.29mOD) are non-planktonic with the epiphyte *Cocconeis placentula* common or abundant in these samples. Other attached, probably epiphytic, species here include *Synedra ulna, Epithemia adnata, Achnanthes clevei, Cymbella aspera* and *Amphora libyca*. Benthic diatoms in [845] and [827] (2.29mOD) include *Gyrosigma attenuatum, Navicula capitata* and the halophiles *Navicula cincta* (this species is also an aerophile) and *Navicula slesvicensis*. The aerophilous diatom *Hantzschia amphioxys* is also present in [845] and [827]. *Synedra ulna* is present in the upper sample from [830] (2.19mOD) along with chrysophyte cysts. Overall then the samples from Monolith <28> have low potential (top three samples) or no further potential (bottom three samples) for diatom analysis.

Monoliths <2>, <3>, <30> & gouge auger sub-sample

A very low concentration of poorly preserved diatoms are present in the basal auger subsample (date 2470-2210BC) from the third sediment sequence evaluated for diatoms.

Consistent with the sandy nature of the basal deposits (context [939]) the most common diatom here is the epipsammic (sand grain surface habitats) aerophile *Ellerbeckia arenaria*. Also present is the attached, halophile *Rhoicosphaenia curvata* and freshwater non-planktonic diatom *Fragilaria brevistriata*. This sample has no further potential for diatom analysis. Diatoms are absent from both samples from

[837] and from [842] at the base of Monolith <30> (1.64 m OD to 1.90 m OD). The lower sample from [838] (1.91 m OD) has a very low number of poorly-preserved valves (*Cocconeis placentula, Gyrosigma acuminatum* and *Synedra ulna*) representing epiphytic and benthic, shallow, freshwater habitats. The upper sample from context [838] (2.10 m OD) has a high concentration of well-preserved diatoms and the assemblage has a high species diversity. Most common are freshwater epiphytes such as *Cocconeis placentula, Epithemia adnata, Fragilaria mesolepta, Gomphonema angustatum* and *Gomphonema truncatum*. Epipelic diatoms such *Navicula radiosa, Navicula tripunctata* and *Navicula slesvicensis* as are also present. Aerophilous diatoms, such as *Diadesmis contenta*, are rare in the upper sample from context [838]. The lower sample from context [822] (2.22mOD), has a moderately well preserved diatom assemblage with some potential for percentage diatom analysis. Again, planktonic diatoms are absent and the diatom assemblage is dominated by shallow-water epiphytes (*Cocconeis placentula, Gomphonema angustatum*), epipelon (*Navicula amphibola, Navicula tripunctata, Gyrosigma attenuatum*) and other attached or benthic species such as *Amphora libyca, Amphora pediculus, Fragilaria brevistriata, Fragilaria pinnata* and *Cymbella sinuata*. The upper sample from context [822] (2.42mOD) has a poorly-preserved diatom assemblage with epiphytes (*Cocconeis placentula, Epithemia adnata, Synedra ulna*) and one aerophilous species (*Hantzschia amphioxys*) and chrysophyte cysts present.

The diatom assemblages in monolith <3> and monolith <2> (contexts [281] and [270]) are generally poorly-preserved. Diatoms are absent from the lower sample in context [281] (3.35mOD). The lower sample in context [270] (2.61mOD) has some potential for further analysis, although diatom numbers are low, with some valves moderately well preserved and moderately high species diversity. The assemblage of diatom context [270] (2.61mOD) is comprised mainly of attached diatoms (*Achnanthes minutissima, Cymbella aspera, Fragilaria vaucheriae, Gomphonema angustatum, Gomphonema olivaceum, Synedra ulna*) with fewer benthic (*Gyrosigma attenuatum, Diadesmis contenta*) species. Planktonic diatoms are again absent from the sample. The diatom assemblages preserved at the top of monolith <3> (context [270]) and in monolith <2> (the upper samples from both contexts [270] and [281]) have no potential for further analysis with low or very low diatom numbers, poor and very poor preservation and very low species diversity. The very poorly-preserved assemblages of the middle samples from [270] (2.91mOD and 3.04mOD) are comprised of non-planktonic species. The attached species *Cocconeis placentula* and *Synedra ulna*, along with the benthic diatom *Gyrosigma attenuatum* are present in [270] (2.91mOD) as is the benthic aerophile *Pinnularia brebissonii*. In [270] (3.04mOD) chrysophyte cysts are common and the aerophilous diatom *Hantzschia amphioxys* is present with *Pinnularia* sp. The attached, halophobous species *Cocconeis pediculus* is also present in [270] (3.04mOD). The uppermost sample from [270] (3.24mOD) has only one diatom species present, the attached freshwater species *Cymbella affinis*. In the upper sample from context [281] (3.53mOD) no diatoms identifiable to species level are present. Diatom fragments and the central area of a large *Pinnularia* sp., which is probably an aerophilous species, are the only diatom remains.

Conclusions and recommendations

Diatoms are present in eighteen samples and absent from six samples assessed from excavation trench PDZ6.01. Approximately 50 diatom taxa were identified in the assessment counts.

The quality of preservation in five samples is good, moderate or adequate so that these have some potential for further analysis. Diatoms are generally poorly preserved and in low numbers in all three sequences evaluated. However, it has been possible to make some inferences about the aquatic environment from the poorly preserved assemblages.

The diatom assemblages are dominated by attached, mainly epiphytic, species with significant numbers of epipelic, mud surface, diatoms and a notable absence of planktonic diatoms. The diatom flora therefore represents shallow water habitats. In some samples significant numbers of aerophilous diatoms and chrysophyte stomatocysts were recorded. This may be the result of inwash from terrestrial habitats or may be the result of the drying out of shallow water habitats.

The diatom assemblages show that nutrient levels were moderate and there is no evidence for eutrophication. The sample from 2.25 m OD [833/839] in Monolith <26> shows evidence for increased conductivity although there are no diatoms present that grow only in estuarine waters.

5.12.2.2.2 OSTRACODS

John Whittaker

Sixteen samples have been assessed for ostracods. These were sub sampled from monolith sample sequences from three sections (five monolith profiles and a gouge auger sample) taken from across the Temple Mill site (PDZ6.01)

Methodology

Each sample was weighed and then thoroughly dried in the oven. Boiling water was then poured on the sample and a little sodium carbonate added to help remove the clay fraction on washing. It was then left to soak overnight. Breakdown was readily achieved when washed with hot water through a 75 micron sieve. The resulting residue was finally decanted back into the bowl for drying in the oven. When dry the sample was stored in a labelled plastic bag. Examination of the residue was undertaken under a binocular microscope. First the residue was put through a nest of dry sieves (>500, >250 and >150 microns) and then sprinkled out a fraction and a little at a time onto a tray.

Results

Overall the results were disappointing. Of the 16 samples examined, only 6 contained ostracods, and only one assemblage (from context [845]) could be considered remotely plentiful and diverse.

Of the four contexts in Period 1: context [830] in Monolith <28> and context [940], obtained from an auger samples below Monolith <30>, contained but plant debris (and seeds); contexts [939] and [942] contained other organic remains, especially molluscs and *Bithynia* opercula, and thus palynology as well as molluscan expertise might be able to attest to their depositional environment.

Eleven of the remaining samples belong to Period 2 and are in part medieval in age (see above). The two samples each from monoliths <28> and <26> contain freshwater

ostracods but only two of the seven from monoliths <2>,<3> and <30> contain them. From other evidence (cladoceran ephippia (egg-cases), charophyte oognia (reproduction bodies of the stonewort plant), and the common occurrence of earthworm granules in most of the samples, the regime was entirely freshwater, verging on semi-terrestrial; once again there is no evidence of any tidal, brackish conditions. What ostracods there are indicate a weedy waterbody (possibly more likely to be natural than man-made) but their absence in the rest of the sequence is puzzling especially when some horizons are rich in molluscs (both gastropods and bivalves) and *Bithynia* opercula. In order to obtain a total picture of these sediments, it is imperative that the molluscs be analysed by a specialist. The occurrence of charophyte oogonia in contexts [838] in Monolith <26>, contexts [845] and [827] in Monolith <28>, and context [837] in Monolith <30> certainly indicate that the water at that time was clear, shallow and not polluted. Plant debris and seeds are common throughout Temple Mills Trench 3 as much of the sediment is organic silt and clay, if not rather peaty.

The one Period 3 sample (context [281]) in Monolith <2> has molluscs, *Bithynia* opercula, earthworm granules and a large amount of "dirty" tufa, which looks like it has been redeposited, either by man for reclamation purposes or naturally, perhaps in a catastrophic washout.

All in all, Trench 3, PDZ6.01, represents a freshwater alluvial environment throughout, but no doubt with different nuances through time. Unfortunately the ostracods are rare and provide only marginal information.

Recommendations

Given the poor recovery of ostracods across the site as a whole no further work is recommended.

5.12.2.2.3 POLLEN

Rob Scaife

Twenty four samples from three sections (five monolith profiles and a gouge auger sample) taken from across the Temple Mills site (PDZ6.01) have been examined. The principal aims of the study were to ascertain if pollen is present or absent in the sediments and if so, to provide preliminary information on the local vegetation of the site and especially data on the environment of deposition.

Methodology

Standard pollen extraction techniques were used on samples of 2ml volume. Pollen was identified and counted using an Olympus biological research microscope fitted with Leitz optics.

Total pollen (assessment) sums of between 100 and 200 grains per level were identified and counted. Percentages have been calculated as follows:

Sum =	% total dry land pollen (tdlp) (incl. Alnus)
Marsh/aquatic =	% tdlp + sum of marsh/aquatics
Spores =	% tdlp + sum of spores
Misc. =	% tdlp + sum of misc. taxa.

Absolute pollen numbers were calculated using the addition of a known number of exotic spikes (*Lycopodium*) to the known volume of sample. Taxonomy in general follows that of Moore and Webb (1978) modified according to Bennett et al. (1994) for pollen types and Stace (1992) for plant descriptions. These procedures were carried out in the Palaeoecology Laboratory of the School of Geography, University of Southampton.

Results

Pollen was recovered in adequate, countable numbers from 23 of the 24 samples which were submitted for analysis. A description of the pollen profiles is given.

Monolith <26> 1.95m.OD to 2.45m.OD [838][833/839]. Four pollen samples from medium brown silty clay with organic material, molluscs and occasional charcoal fragments. Radiocarbon dates are inverted between top and bottom but both data sets fall within the period ca. AD 600-800. Herbs are dominant throughout (at ca. 94%) with only small numbers of trees and shrubs. The latter comprise *Betula* (birch), *Pinus* (pine), *Ulmus* (elm), *Quercus* (oak; 7%), *Fraxinus* (ash). Shrubs include small numbers of *Corylus avellana* type (hazel; to 3%) and occasional *Prunus/Malus* (sloe/blackthorn/wild apple/pear) and *Sorbus/Crataegus* (probably hawthorn) and the dwarf shrubs, *Erica* (heather) and *Calluna* (ling). Herbs which are dominated by *Poaceae* (grasses; to 67%) and *Cyperaceae* (sedges). The latter are of greater importance in the upper levels [833/839] at ca. 2.45m.OD (12% sum + marsh). Cereal type is present with a substantial peak of 19% at 2.05m.OD [838]. Other herbs include taxa of waste/disturbed ground (*Brassicaceae spp., Chenopodiaceae*), grassland *(Plantago lanceolata* and *Poaceae*) and fen/aquatic (*Myriophyllum*; water milfoil, *Typha angustifolia* type; bur reed and reed mace and sedges noted). *Humulus* type (possibly also Cannabis) is occasionally present. These sediment fills are of historic age (early Saxon at ca. AD 600-800) as shown by the radiocarbon dates and also indicated by the paucity of trees and dominance of herbs which include *Plantago lanceolata* (ribwort plantain) and cereal type pollen. The local environment was open and probably dominated by grassland. The depositional environment was a grass-sedge fen perhaps peripheral to a river channel (?slow flowing).

Monolith <28> 2m.OD to 2.49m.OD [830] [827] [845]. Six pollen samples radiocarbon dated to between 800-540 BC and AD 240-420. A basal silty sand in which pollen was almost absent in the lowest level [830] (2m.OD) has been radiocarbon dated at 11,180 to 10,930 BC. Data from this apparent later Pleistocene sample is treated with caution. This is overlain by silty clay containing wood fragments and molluscs [827]. There is a moderate diversity of pollen taxa with preservation better in the upper levels [827] and [845]. *Poaceae* (to 85%) is most important. Cereal type is present throughout in small numbers (peak to 4% in [827] at 2.29m.OD). 'Large' *Poaceae* are also present and which may also be from cereals, *Ranunculus* type (buttercups; 5%), *Plantago lanceolata* (ribwort plantain; 1-2%) are also important. *Cannabis* type (hemp) is present in the lower part of the sequence. Marsh and aquatic taxa include *Cyperaceae* (peak to 40%) with occasional *Sagittaria sagittifolia* (arrow reed), *Potamogeton* type (pond weed), *Alisma plantago lanceolata* (water plantain), *Typha angustifolia* type and *Cyperaceae.* These are more abundant in the upper levels suggesting increasingly wetter conditions. Trees comprise small numbers of *Betula, Pinus*, *Ulmus* (elm), *Carpinus* (hornbeam) and *Alnus*. *Quercus* is most important (17%), especially in the lower half of the sequence although, as noted

pollen totals are small and data are treated with caution. Pre-Quaternary palynomorphs are relatively numerous in the basal sample in context [830] (2m.OD) reflecting the poor pollen content and minerogenic character of the sediments. Dinoflaggellates are present and these may also be derived from pre-Quaternary/geological sediments.

There is a clear anomaly between dates from the upper part of the profile which are of very late prehistoric to Romano-British and the lowest sample which appears to be of late Pleistocene age. The basal level at 2mOD [830] has been dated at 11,180-10,730 BP. Unfortunately, pollen is poorly preserved and a meaningful interpretation of the late Pleistocene flora has not been possible. Large numbers of *Poaceae* are in accord with this period but the numbers of Quercus are anomalous for the period and may be contaminants in the lower gravels. Substantial numbers of reworked geological palynomorphs are from reworked sediments and also a function of the poor pollen preserving conditions. In the upper, late-prehistoric to Romano-British samples, the dominance of herb pollen with few trees and shrubs suggests that locally, the landscape was open grassland. This was probably both wet, seasonally flooded, floodplain grassland and drier pasture on adjacent drier ground. There is some evidence of fen vegetation especially in [845] which may have been marginal to the river channel. Cereal pollen indicates that there was some cultivation although small percentage values suggest that this was not in close proximity to the sample site. It is also possible that this pollen element may have derived from crop processing procedures, domestic and animal waste which was disposed of in the river or on the floodplain

Monoliths <2>, <3>, <30> spanning contexts [939] [842] [837] [838] [822] [270] [281] from the base at 1.41mOD to 3.53mOD. This profile comprises a series of monolith profiles extending from the basal organic sands overlying basal gravels, black/brown humic silty clays with sand lenses, and molluscs. Six radiocarbon dates have been obtained which demonstrate that the lower sediments (pollen zone 1 below) are of prehistoric age from *ca*. 2500 - 2150 BC whilst the upper profile above a hiatus is of historic age. There are, however, inconsistencies in the three upper dates.

Summary

Pollen was recovered from all of the samples examined. The profile is interesting in that it shows a marked change from an alder floodplain woodland environment in the basal levels (1.01m.OD to 1.41m.OD, contexts [939], [842], [837]) to the more typical tree-less, grassland dominated communities evidenced in the other profiles. This sharp change in pollen assemblages probably represents a substantial hiatus which is also evidenced in the radiocarbon dates. This hiatus separates what are late-prehistoric sediments from the more recent alluvial sediments for historic age. These two local pollen assemblage zone are characterised from the base of the profile upwards as follows.

Zone 1: 1.41m.OD to 1.91mOD [939] [837] [842]. Alnus-glutinosa-Quercus. (ca. 2500 - 2150 BC): *Alnus* is dominant with values to 90% in the basal level [939]. In addition there are more trees than in subsequent zone 2. Apart from *Alnus, Quercus* is most important (19%) with small numbers of *Betula*, *Pinus, Ulmus, Tili* (lime). Shrubs comprise *Corylus avellana* type (5%). Herb diversity is low compared with overlying zone 2. Poaceae are most important (to *ca*. 25%). Marsh taxa include

Cyperaceae (10%) with smaller numbers of *Typha angustifolia* type. Spores include *Pteridium aquilinum, Polypodium* and monolete Pteropsida (*Dryopteris* type).

Zone 2: 1.91m.OD to 3.53m.OD. [838], [822], [270] & [281]. Poaceae. (ca. 1000 AD): Overall, a sharp reduction of Alnus and a correspondingly sharp expansion of Poaceae to high values (to 85%) delimit this zone. This zone can also be divided into three local pollen assemblage sub-zones (l.p.a.s.z.):

l.p.a.z.1. (1.91m OD to *ca*. 2.50m OD) [838] [822] is delimited by continuing relatively high values of *Quercus* (to 20%), occurrence of *Fraxinus* (ash; to 3%) whilst *Alnus* and *Tilia* are markedly reduced from zone 1. In addition, *Poaceae*, as noted, expand rapidly along with a much increased diversity of herb pollen types. This also includes expansions of cereal type and *Plantago lanceolata.*

l.p.a.z. 2. (2.50m OD to ca. 2.95m OD) [270]. Values of *Quercus* and *Fraxinus* decline to low levels along with occasional occurrences of other trees. Poaceae remains the dominant along with continued relatively diverse herb pollen assemblages.

l.p.a.z. 3. (2.95m OD to 3.53m OD) upper [270] [281]. *Poaceae* remain dominant with increasing numbers of *Lactucoideae* (dandelion types; to 22%). This reflects the poorer pollen preserving conditions in the upper levels of the sediment profile and some resultant skewing of data in favour of this more robust pollen grain.

Throughout this upper pollen zone marsh and aquatic taxa are present with *Cyperaceae* (20% at 3.53m OD) and occasional aquatic megaphytes including *Nuphar* (yellow water lily), *Potamogeton* type (pond weed) and marginal aquatics (*Typha latifolia* and *Typha angustifolia/Sparganium*).

There is clear stratigraphic/temporal hiatus between lower contexts [939], [842], and [837] below *ca.* 2mOD and contexts [838], [822], [270] and [281] above. The lower, zone 1 has been dated to the late-middle Holocene (Neolithic) (*ca.* 2500 - 2150 BC). The pollen shows an on-site habitat which was dominated by floodplain, alder carr woodland. After the hiatus, this is replaced by a grass-sedge flood plain or fen habitat without woodland. During zone 1, oak woodland with some lime and possibly elm was growing on the drier interfluves. Because of the dominance of the on-site alder, the relative pollen percentages of these tree taxa is under represented. This is due to the filtering effect of the dense on-site woodland and the massive pollen production of alder itself. The degree of under representation of the importance of oak-lime woodland will depend on how far away the drier interfluves were. This is especially applicable to lime (*Tilia*) which may be markedly under represented in pollen spectra due to anemophily and flowering during mid summer when all trees are in leaf which further inhibits pollen dissemination. Above the hiatus (in zone 2), the local environment changes to one of much more open aspect. Grass dominated communities are important throughout the local area probably both on the flood plain and fen habitats and on drier ground as pasture. This is in accord with the majority of other Olympic sites which have been examined. The very low arboreal and shrub values are similarly comparable to other Olympic sites and it is thought that these generally derive from more regional and long distance sources as opposed to near sources. The exception may be ash (*Fraxinus*) which is present in l.p.a.z. 1. This is poorly represented in pollen assemblages/spectra. Along with oak this also became

depleted. This may represent the final stages of woodland clearance in the local region. This requires additional work and adequate radiocarbon dating.

Overall, the pollen assemblages described are typical of the historic period as dated at this and other Olympic sites. Walnut (*Juglans regia*) is an interesting and diagnostic occurrence at 2.42m.OD [822]. This tree was a Roman introduction into Europe as a whole and its presence her affords a useful Romano-British (or later) marker. There are now a substantial number of records for walnut within the London region (Scaife 2000).

Conclusions and recommendations

Three profiles have been examined. Sections/monoliths <26> and <28> have broadly similar palynological records which are also similar to other Olympic sites assessed. That is, they show an open, treeless environment in which floodplain and nearby dry grassland (pasture) appears to have been the principal habitat. These sequences date to the historic period and are typical of pollen data from this period.

The long profile produced here from monolith profiles <2> <3> and <30> also covers the historic period and shows similar pollen characteristics to <26> and <28>. However, basal sediments are clearly of much earlier age, being of late prehistoric date (Neolithic) with evidence of woodland. Thus, it is suggested that if further work is undertaken. This should concentrate on this longer and more varied profile which seems to embrace all aspects of the local palaeoecology. Some additional work, to publication standard, should be undertaken and the following points should also be considered.

The additional analysis should be carried out at a closer-sampling interval. Ideally this should be at 8cm intervals throughout, with 4cm or closer at horizons of interest or change. The lower levels where woodland is dominant would repay analysis at this closer sampling interval.

Pollen counts of 500 or more grains per sample, where preservation permits, would be appropriate. This may provide greater taxonomic and thus, ecological detail.

Pollen preservation is typically poorer in the upper alluvial sediments especially where drying out and resultant oxidation has occurred. Absolute pollen frequencies are in the order of only hundreds or thousands of grains/ml at most. Thus, sample volumes of 2-3ml are required for any meaningful results and rigorous extraction procedures are required to concentrate the pollen. This is less critical in the lower levels of the sequence where conditions have remained wetter.

Interpretation of results must take into account the complex taphonomy of the pollen in these largely alluvial sediments. That is, the pollen catchment is also dictated by fluvial sources as well as airborne and also, the possibility of secondary pollen from human domestic activities.

For the lower levels an appropriate pollen sum which excludes *Alnus* should be counted to enable more realistic interpretation of the off-site vegetation communities to be made. This is in accord with Janssen (1969). Whilst the taphonomic effects of dominant alder floodplain woodland reducing external pollen input will always pertain, higher counts of the non autochthonous component would give a better statistical and interpretative accuracy. The sheer dominance of alder in relation to other taxa may make obtaining counts of 500 non-alder pollen time consuming and

difficult and as such the analyst must be allowed to exert judgment on totals counted. Pollen of *Alnus* and other autochthonous types should, of course, be recorded outside of the pollen sum. (sum + *Alnus* in the final; calculation).

5.12.2.3 Dating

Although some idea of the date of the deposits excavated has been inferred from their characteristics and level and very occasional dateable finds, environmental evidence unlike artefacts, is not intrinsically dateable and the information about the past landscape preserved in the deposit sequence means little unless it is tied in to an archaeological timeframe. As a consequence, sub-samples were taken from suitable deposits in the monolith tin samples for radiocarbon dating by Accelerator Mass Spectrometry (AMS), which was carried out by Beta Analytic, Florida. See Table 28, Table 29 and Table 28, below for the AMS results.

Height m. OD [Context]	**MoLAS ref.**	**Lab no.**	**$^{13}C/^{12}C$ ratio**	**Uncalibrated date**	**Calibrated date 2 σ (95% probability)**
2.45 [833/839] <26>	OLY601262.45	Beta 257998	-26.9%	1430 ± 40 BP	AD590 to 670 (1360-1280 BP)
1.95 [838] <26>	OLY601261.95	Beta 257997	-27.1%	1330 ± 40 BP	AD640 to 770 (1300-1180 BP)

Table 28: AMS radiocarbon dates for monolith sample sequence <26>

Height m. OD [Context] <Mono>	**MoLAS ref.**	**Lab no.**	**$^{13}C/^{12}C$ ratio**	**Uncalibrated date**	**Calibrated date 2 σ (95% probability)**
2.49 [845] <28>	OLY601282.49	Beta 258001	-27.2%	1750 ± 40 BP	AD240 to 420 (1710-1530 BP)
2.21 [827] <28>	OLY601282.21	Beta 258000	-27.7%	2580 ± 40 BP	800 to 720BC (2750-2670 BP) 700 to 540BC (2650-2490 BP)
2.00 [830] <28>	OLY601282.00	Beta 257999	-25.7%	11090 ± 60 BP	11180to10930BC (13130-12880BP)

Table 29: AMS radiocarbon dates for monolith sample sequence <28>

Height m. OD [Context] <Mono>	**MoLAS ref.**	**Lab no.**	**$^{13}C/^{12}C$ ratio**	**Uncalibrated date**	**Calibrated date 2 σ (95% probability)**

Height m. OD [Context] <Mono>	**MoLAS ref.**	**Lab no.**	**$^{13}C/^{12}C$ ratio**	**Uncalibrated date**	**Calibrated date 2 σ (95% probability)**
3.53 [281] <2>	OLY650760123	Beta 258002	-25.5%	2040 ± 40 BP	160BC to AD60 (2110-1890 BP)
3.04 [270] <3>	OLY650760133	Beta 258003	-26.7%	11270 ± 40 BP	AD670 to 890 (1280-1060 BP)
2.32 [822] <30>	OLY60130T242	Beta 257996	-27.8%	960 ± 40 BP	AD1030 to 1220 (920-730 BP)
1.9 [837] <30>	OLY60130B190	Beta 257995	-27.8%	3850 ± 40 BP	2460 to 2200BC (4410-4150 BP)
1.6 [837] <30>	OLY60130B164	Beta 257994	-27.5%	3880 ± 40 BP	2460 to 2190BC (4410-4140 BP) 2170 to 2150BC (4120-4100 BP)
1.41 [939] <auger>	OLY601AUG141	Beta 257993	-27.3%	3920 ± 40 BP	2470 to 2260BC (4420-4220 BP) 2260 to 2210BC (4210-4160 BP)

Table 30: AMS radiocarbon dates for monolith sample sequence <2>,<3>, <30> and gouge auger

The AMS results have been grouped according to the three different sedimentary profiles, all from Trench 3, discussed in the environmental section of the report.

Monolith <26> sampled alluvial layers of a N–S flowing channel [843] returning dates from the early/mid Saxon period. These dates, although overlapping, do appear to be inverted however, indicating anthropogenic disturbance.

Monolith <28> sampled alluvial layers from the water channel [843] at the eastern end of the trench over sediments [830] considered in the field to be of considerable antiquity as they were similar to sediments seen elsewhere across the Olympic site (PDZ12.01). [830] was indeed very old being pre-Holocene in date whereas [827] and [845] returned dates allying to the LBA/EIA boundary and mid-late Roman period, respectively.

The final group of dates relate to an amalgamated profile consisting of monolith samples <2>, <3>, <30> and an auger sample. These sampled sediments to the extreme west of trench 3 from the marginal deposits of the Waterworks River and returned dates allying to the Neolithic at the base ([837] and [839]) and also an inverted sequence of dates spanning the LIA/early Roman period [281] the Saxon period [270] and the medieval [822] in the top half of the sequence.

5.12.3 Synthesis of environmental and geoarchaeological results

The results of the different types of sedimentary, macrofossil, microfossil and radiocarbon assessments outlined above have been drawn together in this geoarchaeological summary. All sediments examined, with the exception of [830] which is assigned to period 1 (the natural drift geology), are period 2, a sequence of alluvial deposits including organic peaty layers and silted up channels.

5.12.3.1 Monolith sample sequences

Monolith sample sequence <28> was taken from a south facing section toward the eastern end of Trench 3 to the north of the site (Fig 13) and sampled alluvial sediments including a distinctive yellow silty sand [830] which formed a river bank similar to that seen in PDZ12.01. The monolith sampled sediments from approximately +1.99mOD to +2.49mOD. The lowest context, the yellow silty sand [830] was dated to the upper Palaeolithic at 13,130-12,880 BP (11,180-10,930 BC), the earliest date returned for the site. Unfortunately, both the macro and microfossil assessments returned little information on this context other than to confirm, through pollen assessment, that during the time of deposition the local environment was probably an open one dominated by grasses. This is typical for the period as during this stage of the upper Palaeolithic, the Devensian cold stage (or Ice Age) was drawing to an end at the boundary of the Windermere Interstadial (Allerod) and Loch Lomand stadial (Youngr Dryas) which was the final cold stage prior to the Holocene period.

The subsequent context, the organic silty clay [827], which was found to lay over [830], indicates a significant change in river regime. As found elsewhere across the Olympic site, the alluviation process which deposited [827] was probably a slow one with seasonal flooding laying down accretionary deposits although sand lenses at the base of the unit tend to indicate more intense flood events at least initially. The radiocarbon dates indicate there is a considerable hiatus in time between the deposition of [830] and [827] as [827] was dated to the late Bronze Age or early Iron Age (800 – 720 BC or 700 – 540 BC). It is possible that the channel of the riverbank [830] lay undisturbed for the intervening 10,000 years although it is more likely that it suffered erosion (and deposition) through periodic activation before finally succumbing to the silty clays of [827]. In contrast to the context below it, [827] was found to be rich in macro and microfossils. Plant macrofossil assessment was abundant in aquatic seeds but also species reflecting disturbed and waste ground indicative of anthropogenic/agricultural activity. This is reflected in the pollen data which found both cereal and, interestingly, hemp growing nearby or being processed on the site. Grass however was the dominant plant across the floodplain with the river margins thick with sedge and reed with Oak dominating the woodland on the higher ground. Both the diatom and ostracod assessment indicated the river to be freshwater, clear, clean but shallow probably reflecting the nature of the flood deposit lingering on the floodplain. A similar organic silty clay context, [845], overlay [827]. [845] was dated to the mid to late Roman period (AD 240 - 420). Although the plant macrofossils were found to be similar to [827] there was the noticeable increase in cultivated wild fruits for example, as well as exotic Roman imports such as grapes (*Vitis vinifera*). Generally, however, the floodplain environment was found to be becoming increasingly wetter with an increase in marsh species noted in the pollen.

Diatoms reflected shallow freshwater and ostracods indicating clear clean conditions in the area at this time.

The deposition of the silty clay over the Pleistocene deposits (and the marshy conditions which will come to dominate the area over time) reflect a significant shift affecting the Lea river catchment dynamics since the early Holocene. The 'ponding back' of the Lea, probably caused by relative sea-level rise (RSL) affecting the Thames, would have raised the general level of the groundwater in the lower Lea river system. This ultimately increased flood events leading to the periodic deposition of the silty clays across the floodplain and reactivation of redundant Pleistocene channels. On the other hand, vegetation clearance and agricultural activity occurring from late prehistory would have also increased the erosion of fine sediment into the river catchment (Robinson et al, 1984) but to what degree this had an affect on the dynamics of the fluvial environment remains unclear.

Again in Trench 3, monolith sample sequence <26> was taken from an north facing section at the eastern end of the trench to sample alluvial sediments (Fig 13). The sediments included foreshore or channel deposits of an eastern (N-S flowing) channel [843] measuring some 4.70m wide and 0.55m deep recorded in section 36. The single monolith tin sampled sediments between approximately +1.95mOD to +2.45mOD.The lowest alluvial context [838], a dark brown, organic silty clay, was dated to the early/mid Saxon period (AD640-770) and was truncated by three possible stake holes [868], [870] and [872] which could represent a man made structure within the channel. Over [838] lay context [836], a poorly sorted, steeply (eastward) sloping lens of poorly sorted sands, gravels and occasional chalk fragments thought in the field to represent the foreshore deposit of the channel. Interestingly, as mentioned above, bones of foals were found in [836] during the excavation indicating horse breeding in the locality. Finally, over [836] lay context [833/839], an organic silty clay very similar to [838] but with occasional ceramic building material (CERAMIC BUILDING MATERIAL) and discrete patches of sand in section. [833/839] was dated to the early/mid Saxon period (AD590-670). The top of [833/839] was also seen in section to dip steeply in the same direction of [836] and, indeed form a roughly concave surface eastward for some 2m or so, indicative of a channel. The organic sediments of [833/839] and [838] returned good results in nearly all micro and macrofossil assessments. The plant and pollen work indicated anthropogenic activity with disturbed ground taxa and cereal production evident. Furthermore, although the local environment was dominated by grasses, there was evidence of Ash, Elm and Oak on the higher ground but also, importantly, wild apple and pear which would have supplemented the diet locally. Insect species further indicated the grazing/waste of animals in the area, another agricultural indicator, but also clean, flowing, shallow open water. Although these conditions are typical of the Saxon period as seen elsewhere on the Olympics site, there is something of a dating inconsistency here as the sediments of the higher context [833/839] date slightly earlier than [838] although it should be borne in mind the date ranges overlap. It is likely that these sediments do come from and represent the conditions of the early Saxon period but it is not entirely clear as to whether they are *in situ* or not having possibly been dug up, presumably very locally, and used to line the base or bank of the newly formed stream. Furthermore, the sandy gravels of [836] with their chalk inclusions that divide the organic deposits of [838] and [833/839] could point to a later (medieval) date than this especially as the spot dates of other period 2 sediments

have all related to the early medieval period onward. Ultimately, at this assessment stage, this must remain a question for further analysis.

Finally, the last sedimentary profile to be assessed consisted of a number of monolith sequences (<2>/<3> and <30>) and a gouge auger investigation which, for the purposes of this report, have been amalgamated to create an almost continuous profile through Trench 3 on the extreme western side of the trench (Fig 12). The combined monolith and auger sequences sampled sediments from approximately +1.40m OD to +3.53m OD (with a gap in sampling between +2.42m OD and +2.63m OD) from beneath the made ground to over the gravels at the deepest point investigated (the gravel of [940] was encountered in a machine-dug sondage during the field investigation although rapid ground water inundation meant that for health and safety reasons the sondage had to be rapidly backfilled). The lowest contexts sampled by gouge auger and monolith tin consisted of gravels [940] overlain by light brown silty sand [939] which in turn was overlain by a dark brown silty clay [837] with the sands of [842] within it (+1.40mOD to +1.91mOD). As elsewhere in the Lea valley, the gravels of [940] are considered to be late Pleistocene or early Holocene deposits of a high energy, post glacial fluvial environment forming braided channels across the floodplain. In this area at the extreme western part of the site it is likely that the gravels fringed the floodplain of the stream just to the west of the site. In contrast to [940] the sands and clays of contexts [939] and [837] (the latter dated top and bottom) overlying the gravels are much later in date but all, interestingly, of the same period between 2470 and 2210BC, in the later Neolithic. This indicates a significant period of flooding during an isolated period in prehistory possibly being a sign of a time when the influence of the ponding back of the Lea affected this area inundating the lower lying parts of the site. The sands of [939] and especially [842] within the silty clays point towards periods or pulses of higher energy flood deposits followed by or during relative periods of quiescence during which [837] was deposited. All environmental indicators returned good results for the more organic deposits of [837] and [842]. Plant macrofossil and pollen assessments describe an environment fairly rich in trees with Alder at the river's edge and Oak dominated woodland on the higher ground. Anthropogenic disturbance was seen in the plant and insect assessment with disturbed or waste ground plant species and beetles associated with dung in evidence (and two sheep bones thought waterlain were recovered from [842] during fieldwork). The wider ostracod assessment found this river marginal area to be shallow with clear, clean freshwater although, in contrast and possibly reflecting the environment of the floodplain after floods occur, the insect assessment found evidence of stagnation in shallow pools with floating rafts of vegetation (as well as evidence of clear running freshwater). This environment continued to prevail similarly in context [838] (lying over [837], +1.91mOD to +2.22mOD) although it is interesting to note this context was dated to the early/mid Saxon period in monolith <26>. The date of [838] must remain a matter of conjecture in this profile however as monolith <30> was some distance from monolith <26> and it is known there has been interference with the sediments above these levels and possibly within monolith <26> itself. Indeed, the dates returned for the top three contexts sampled [281], [270] (monolith sequence <2>/<3>) and [822] (monolith <30>) indicate clearly that these sediments have been dug up and redeposited as all are sequentially inverted (from +2.63mOD to +3.53mOD: [822] AD1030 to 1220, medieval; [270] AD670 to 890, early Saxon; [281] 160BC to AD60, LIA to early Roman). Although the deposits have been disturbed it is not necessarily the case that the environmental information they contain

should be ignored however - especially on a microfossil level - except for perhaps for context [281] at the top of the sequence which showed signs of weathering and exposure skewing the pollen data toward the prevalence of more robust species. Notably the pollen spectra for the Saxon period in [270] is very similar to other deposits of this period across the Olympic site as was the occurrence of walnut found in the medieval deposit [822] (found similarly in a deposit in PDZ3.39 OL-04407 and thought also to be medieval). If we accept therefore the microfossil data is sound for [270] and [822], it is of interest to note that the number of trees in the area had increased from the early Saxon period through to the medieval period which could be a sign of a reduction in the intensity of agriculture over the latter part of the first millennium.

5.12.3.2 Non-monolith macrofossil data

Outside of those contexts associated directly with the monolith samples, a number of bulk samples were also examined for macrofossil data:

Period 2: [839] [1005] [1006] [1007] [1008]. This phase represents a sequence of alluvial deposits including organic peaty layers and silted up channels. The plant macrofossils in the contexts for this phase were moderately rich in seeds from wetland areas and disturbed or waste ground species indicating anthropogenic/agricultural activity across the floodplain as seen in detail in the microfossil assessment. Mollusc assessment of [839] returned little useful data unfortunately other than indicating freshwater environment. Insect assessment of [1006] and [1007] in particular found several aquatics and damp ground taxa present as well as taxa usually associated with dung denoting agricultural activity in the vicinity of the site during this time.

Period 3: [394] [489] [515] [580] [763] [950] [952] [969] [984]. This phase represents the drainage of the marsh and the creation of land suitable for industrial development.

The plant macrofossils in the contexts for this phase were not particularly productive often with clinker and charcoal indicative of post medieval industrial activity. Moderately rich plant material was found in [950] and [952] however with wetland areas and disturbed or waste ground species indicating anthropogenic/agricultural activity. Likewise insect remains were largely poor except for context [952] with beetles reflecting clean, clear running water but also woodworm beetles and weevils probably indicative of the conditions of the mill and mill race cut [615] from which it was sampled. Molluscs seen in [763], [950] and [952] in particular continued to indicate freshwater and damp grassland conditions prevailing on the floodplain.

Period 5: [207].This phase represents a period of redevelopment of the area in the late 18th century and into the middle of the 19th century. The drain fill [207] produced one moderately rich seed assemblage containing mainly elder seeds as well as common garden snail and other moisture and shade loving snails and the common oyster.

Period 6: [181] [214] [534] [546]. Demolition of buildings and the infilling of some earlier features including a possible well, ground raising, laying of a road and pavement, and continued maintenance of the surviving cottages. Three of these contexts produced rich clinker deposits with only [181], a barrel fill, yielding a fairly large number of seeds albeit mostly from elder and some snails.

5.12.4 Summary

Overall the contexts assessed through sedimentary, macrofossil, microfossil and radiocarbon analyses have returned clear indications of the nature of the local environment and anthropogenic disturbance.

The sediments sampled spanned the Holocene period from context [830] from monolith <28> dating to the cold stage just prior to the Holocene through to the medieval deposits of [822] in monolith <30> with the bulk of the sediments dating from the Neolithic onward. Essentially the channel marginal deposits of profile <2>, <3>,<30> and the gouge auger sample, indicated that from the Neolithic the natural environment typically was an open one, consisting of grasses and sedges with tree species such as Alder initially along the edges of the river with Oak dominated woodland on the higher ground. The river itself, running north/south to the west of the site, was freshwater and unpolluted, probably shallow, quiet or slow-moving, with rich vegetation. At the top of the profile in monoliths <2> and <3> the sediments were found to be redeposited probably sometime in the late medieval period, possibly through land consolidation work or simply clearance of the channel.

Interestingly, although throughout the bulk of late prehistoric and early historic period the area was largely open grassland, by the medieval period the land becomes once again more wooded including Walnut possibly used to supplement the diet [822]. Anthropogenic disturbance or influence was found to have occurred much earlier however as both macro and microfossil data indicate agricultural activity including grazing of animals from as early as the Neolithic with crop production becoming evident by the LBA/EIA period [827] and indications of viticulture by the Roman period [845] (both contexts in monolith <28>). Finally, by the Saxon period cereal production was at its peak along with the use of wild apple and pear.

All the while since the earliest flood deposits recorded in the late Neolithic, the site has suffered from flooding typical to the lower Lea area induced probably through a rise in RSL which ponded back the river. Over time the area became more of a marshland although by the medieval period was being drained and controlled for the benefit of agriculture and mills for example, as was the case at this site.

With the exception of ostracods further work has been recommended on all levels for the analysis stage.

5.13 Animal bone

Philip L. Armitage

5.13.1 Introduction

A total of 205 hand-collected animal bone elements from 40 contexts were submitted for identification and assessment. Of the 205 specimens, 166 (81% of the total) were identified to species and anatomy and 39 (19%) remained unidentified owing to their high degree of fragmentation/poor preservation/absence of diagnostic features.

See Appendix 7: animal bone for listings.

There were no amphibian or reptile species represented in the submitted samples. Listed below are the 8 mammalian, 1 bird and 1 fish species represented by the bone elements/fragments:

Mammals:

horse ***Equus caballus*** (domestic)
cattle ***Bos*** (domestic)
sheep ***Ovis*** (domestic)
pig ***Sus*** (domestic)
dog ***Canis*** (domestic)
rabbit ***Oryctolagus cuniculus***
cf.fallow deer ***Dama dama***
brown rat ***Rattus norvegicus***

Birds:

rock dove/domestic pigeon ***Columba livia***/domestic

Fish:

plaice ***Pleuronectes platessa***

5.13.2 Methodology

For the purposes of assessment, records were made of the numbers of identified bone elements/fragments (NISP) according to each species represented. Species identifications were made employing the author's own modern comparative osteological collection. Fragmented bone that could not be identified to species/anatomy was, where possible, categorized according to relative size of the animal represented: horse/cattle sized or pig/sheep/goat sized. The remaining unidentifiable/highly fragmented bone was categorized as "scrappy".

Ages in the adult horse premolar and molar teeth were determined using crown height data (see Appendix 7: animal bone) (method of Levine 1982), and for incisors, the attrition criteria of The American Association of Horse Practitioners (1966). The age of the foal mandible from (836) (see below) was established from its tooth eruption stage (criteria of Silver 1971: 291) and that in the foal metatarsal bone from (831) (see below) was based on epiphyseal fusion (criteria of Schmid 1972:75). Sex in the horse mandibles was determined by the presence of lower canine teeth - canines are absent in mares.

Measurements (in mm) on the more complete adult mammal bone specimens (see Appendix 7: animal bone) were made using Draper dial callipers (dial graduations 0.02mm) and a flexible tape measure, following the system of von den Driesch (1976). Reconstructions (estimates) of stature (withers heights) in the horses represented were based on length measurements taken on limb bones (calculated after the method of Kiesewalter 1888).

5.13.3 Taphonomy and condition

Overall, preservation was assessed as fair (moderate) to good, though fragmentary. Fragmentation was especially noted in two deposits:

- Period 4 deposit (239) lower fill of cut [209] – horse skull and mandible specimens were highly fragmented, with a high frequency of loose teeth
- Period 6 deposit (215) channel fill – a dog skull was highly fragmented

There was only occasional evidence of any effects/modifications arising from sub-aerial weathering or biological degradation. It would appear therefore that bulk of the bones had been buried shortly after being discarded. Staining of the bone varied from grey brown, yellowish brown to dark brown, with some specimens exhibiting iron staining.

Overall, the incidence of dog gnawing was remarkably low (detected in only two specimens) and rat gnawing was noted in a single fragment from (641) [Period 5] There were no burnt bones.

5.13.4 Summaries of the animal bone assemblages by site phase

The bone assemblages comprised discarded household (kitchen/table) food refuse and non-food bones: the remains of horses, dogs, and one rodent vermin, as summarised below:

5.13.4.1 Period 1

Deposit (211) yielded a dog fourth metatarsal bone from a medium to large sized animal. Deposit (842) produced two sheep bones: one complete metacarpus shaft with distal epiphysis unfused/detached and one tibia with distal epiphysis unfused/detached. All three were stained dark brown – a feature commonly seen in bones from water lain deposits.

5.13.4.2 Period 2

Evidence of local horse breeding in the vicinity was provided by two immature bone elements:

- 1 metatarsus III with the distal epiphysis unfused/detached (context 831) - from a foal aged 12 to 15 months at time of death
- 1 mandible with dp2, dp3 and dp4 erupted and in wear; M1 was just visible in its crypt (context 836) – from a foal aged less than one year at time of death

5.13.4.3 Period 3

Food waste from Period 3 deposits suggested beef formed the principal meat in the diet of the inhabitants at this period, which was supplemented by lesser quantities of mutton and pork.

5.13.4.4 Period 4

The Period 4 assemblage was predominated by horse bones (mostly skull/mandible fragments & loose teeth but also hind leg bones) representing the remains of at least three animals: 1 male aged eight to nine years at time of death; 1 male aged 9 to 10 years; and one animal (sex indeterminate) aged seven years.

The right hind leg of an adult horse was represented by the following elements: femur, tibia, astragalus, calcaneum, navicular bone (= os centrotarsale), 3rd tarsal bone (= external cuneiform), metatarsal bones II, III and IV.

5.13.4.5 Period 5

Food waste from the Period 5 deposits suggested a diet predominated by mutton and beef. Variety in the diet was provided by consumption of the occasional pig, rabbit and pigeon.

Bone working activity at the site or nearby was indicated by a sawn portion of cattle scapula blade with a disc cut out (? button manufacture) from (641). Two sawn cattle rib shafts from the same deposit were also interpreted as possible bone-working waste.

5.13.4.6 Period 6

Mutton appeared to be the principal meat in the diet of the inhabitants at this period. Deposit (584) yielded the only fish bone among the submitted samples: identified as a caudal vertebra of a plaice. This specimen had been chopped. The presence of scavenging rodent vermin at the site was indicated by the pelvic bone of a brown rat recovered from the same deposit.

5.13.5 Recommendations

Although the excavation yielded only a very modest quantity of animal bone, study of this material has offered some insight into the diet of the local inhabitants in the post-medieval/early modern period, as well as revealing horse breeding in the locality. It is therefore recommended that a brief summary of this faunal material is prepared for inclusion in any final Olympic archaeological publication.

6 Potential of the data

6.1 Realisation of the original research aims

The research aims and objectives for the excavation were established in the *Written Scheme of Investigation for Archaeological Excavation* (MoLAS-PCA 2008).

Can surviving remains of the medieval and post-medieval mills at Temple Mill provide information on the nature of the industrial activity in the Lea Valley?

Such remains were uncovered in Periods 3 and 5 with evidence for a foundry (Building 2, Period 3), a millrace (to the south of Building 2, Period 3) and dying (Period 5). It is thought that the millrace and the foundry were part of the one of the historically attested mills at Temple Mills known to have been producing brassware and other metal products.

What was the pre-modern/pre-Victorian topography of the zone?

In Period 2 (late Bronze Age/early Iron Age–medieval) the site area was open and marshy, subject to intermittent flood episodes. Reclamation occurred in Period 3 (late 16th/early 17th century–late 17th/early 18th century), after which the area became dryland with buildings. Ground raising occurred with each phase of reclamation.

How extensive is modern truncation across the zone? Do made ground deposits bury or truncate the post medieval/modern land surface?

Modern truncation had not affected the site area – modern dumps directly sealed the Period 6 features, dated to after *c* 1850. The site sequence survived untruncated beneath Period 6.

Is there evidence for past water management, i.e. drainage ditches, mill remains, sluices and revetments associated with earlier courses of the Channelsea River/Henniker's Ditch and River Lea?

The Tumbling Bay Stream, extant on the eastern side of the site from at least the late 17th century, provided evidence of management of the waterway in the form of artificial banks. The engineering techniques and materials used in waterfront construction were also recorded. The unearthing of part of the tie-back to a revetment to the west and beyond the limit of excavation suggested that the Temple Mills Stream was also being managed from at least the 17th century. Remains associated with mills were also recorded.

6.2 General discussion of potential

The archaeological remains excavated and recorded at the site were moderately well preserved. There is scope for further work to be carried out that will enable a fuller picture of the lower Lea Valley to be realised by contextualising the site in relation to the other Olympic archaeological interventions, local historic-period industrial activity, defining and dating the activities in its landscape.

Further analysis of the stratigraphy has wider implications in that it has the potential to complement other contemporary landscapes (including the industrial period) in the

region, acting as a comparative resource for other sites in the Lea Valley as well as a allowing the chronological sequence of (Olympic Park) site-wide settlement pattern to be refined.

Evidence for prehistoric landscape activity has been found, although no settlement activity at the site was found. Radiocarbon analysis broadly dates these archaeological features which should be considered in relation to the Olympic site as a whole. Taken with the environmental evidence, the finds add to defining the character of the area.

The environmental and geoarchaeological assessments have returned clear indications of the nature of the local environment. Insect, pollen and plant material recovered clearly portray a long period of marsh-like environments under the influence of a local freshwater rivers.

The wooden trackway structure reflects the first evidence for exploitation/management of this wetland. No evidence was found for a Roman causeway, nor was there any evidence for cultural activity dating to the Saxon/medieval period. The lack of features preceding the walkway indicates that habitation and exploitation in the vicinity at these times was not intensive. Rising water levels and increased flooding at these times is one explanation for this lack; shifting river channels removing evidence for active management systems another.

Although no surviving remains of the medieval mill was found on the site, parts of the a late 17th/early 18th century mill complex were unearthed. The excavated archaeological features included the masonry remains to a building that probably housed a furnace used for metal working. The proximity to a major and expanding market (ie London) would have made this area attractive for industries such as metal working.

From the end of the 18th century the site appears to have been part of land that was occupied by calico printers and flock paper manufactures. The remains of workers cottages and features and buildings possibly of an industrial or commercial nature were uncovered. By the mid 19th century these industries were redundant, but the cottages on the site continued to be occupied until the early 20th century. The masonry and timber remains, the archaeological features and deposits, the recovered artefacts as well as the faunal material collected provide a unique record of the industrial history of the site and an insight into the daily life of the inhabitants.

There is potential for research of early post-medieval foundries and metal working to allow for a greater level of the interpretation of some of the features and structures recorded. Similarly, archaeological parallels should be sought for calico printing. A full map regression exercise of all the cartographic evidence has the potential to more accurately position the site and the archaeologically-recorded structures. The historical background, when integrated with the archaeological evidence, has the potential to offer a coherent story of the development of the site.

Specific aspects of the site archive have potential to address key research questions based on themes/issues that include:

- the chronological development of the site
- settlement patterns, land reclamation and land use

- exploitation of local resources and habitat
- the proximity of the site to a water course and the influence this has on the site and settlement patterns along the Lea Valley
- the industrial development/use of the site, the area and its relationship to the surrounding economy

In summary, the excavation has the potential to contribute to the understanding/reconstruction of the lower Lea Valley, and how this may have determined or helped shape settlement patterns and communications (Museum of London 2002, 78–9). As a baseline, the excavation has the potential to form part of a model used to develop an understanding of landscape formation (Museum of London 2002, 79), economy and industry (Museum of London 2002, 73).

7 Significance of the data

The excavation has added direct information to the archaeological understanding of the area. Pre-reclamation sediment deposition has been due to flood events. The sequence of channel features within this deposition relates to the influence of local rivers in a marshy environment. There was no evidence for pre-16th century activity, as the site was too waterlogged in these periods for occupation, or to be effectively exploited in an archaeologically visible manner.

The environmental and geoarcheaological analyses have returned clear indications of the nature of the local environment, under the influence of a local freshwater river.

The post medieval structures provides evidence of the implementation of reclamation and subsequent use of this landscape and exploitation of the riverine environment associated with the Lea. This aids current understanding of the past land use of the site it should be able to provide locally significant information regarding human–environment interaction.

The archaeological remains are significant in two ways:

- they impose a time frame onto the sequence of environmental information
- the archaeological evidence indicates how marginal areas were used/managed in specific periods

The site archive, when contextualised with other local sites, may demonstrate if the emergence of potentially arbitrary water management as seen here was confined locally or symptomatic of regional practice.

The results of the excavation have potential to inform a wider, regional study of the industrial landscape of the Lower Lea Valley and management of the Lea waterways, pertinent to Framework Objective L10 (Distribution and Consumption) of the Research Framework for London Archaeology (Museum of London 2002, 76); Hydrology research theme TL2 (ibid, 79); the Production research theme TE1 (ibid, 83); Framework Objective TE4 (Material Culture Studies) (ibid, 84) and Framework Objective TS3 (Cultural and Social Property) (ibid, 84)

The environmental evidence, when correlated with data from adjacent sites, will characterise prevailing and changing climatic and ecological conditions throughout

the archaeological record (TL1, TL4, Museum of London, 2002, p79-80). Furthermore, all data may be used to supplement borehole results to complete regional models of buried topography and geomorphology. The characterisation of this part of Newham's former climate and environment is therefore of regional significance.

Overall, this information will contribute to our understanding of the past environment of the site and its environs and will assist in the construction of landscape reconstruction models to place the archaeology within its landscape context. This information is certainly of local significance and of regional significance when examined alongside the body of data from the Olympic Park as a whole.

8 Recommendations

Although on its own the site merits publication, it is recommended instead the results of this excavation are assimilated into a site-wide assessment of all archaeological interventions of the Olympic site to assign contextual significance and further refine the importance of the archaeological survival, and thereafter assimilated into any publication discussing/disseminating the results.

The decision on the appropriate archaeological response to the deposits existing on the site rests with the Local Planning Authority and their designated archaeological advisor.

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10 Bibliography

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

American Association of Equine Practitioners 1966 *Official Guide for Determining the Age of the Horse* American Association of Equine Practitioners.

Atkinson, D. and Oswald. A., 1969 London clay tobacco pipes. *Journal of British Archaeology Association*, 3rd series, Vol. 32, 171-227.

Bailey G, 2004. *Buttons and Fasteners 500BC – AD1840*, Greenlight Publishing

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

Baker, T.T.F. (Ed). 1995. *A History of the County of Middlesex*, Volume 10

Barber, B, Chew, S., Dyson, T & White, B. 2004. *The Cistercian abbey of St Mary Stratford Langthorne, Essex: archaeological excavations for the London Underground Limited Jubilee Line. Extension Projec*t, MoLAS Monogr Ser 18, London.

Battarbee, R.W. 1986. Diatom analysis. In: Berglund, B.E. (ed) *Handbook of Holocene Palaeoecology and Palaeohydrology*. John Wiley, Chichester, 527-570.

Battarbee, R.W., Jones, V.J., Flower, R.J., Cameron, N.G., Bennion, H.B., Carvalho, L. & Juggins, S. 2001. Diatoms. In (J.P. Smol and H.J.B. Birks eds.), *Tracking Environmental Change Using Lake Sediments Volume 3: Terrestrial, Algal, and Siliceous Indicators*, 155-202. Dordrecht: Kluwer Academic Publishers.

Beijerinck W. 1947, *Zadenatlas der Nederlansche Flora* I-II. Veenman and Zonen. Wageningen.

Bradley, T. & Butler, J. 2008. *From temples to Thames Street – 2000 years of riverside development. Archaeological excavations at the Salvation Army International Headquarters.* Pre-Construct Archaeology Ltd Monograph 7, London.

Bullock, J. A. 1992. Host plants of British beetles: a list of recorded associations. Supplement to A Coleopterist's Handbook . *The Amateur Entomologist* 11a.

Charleston RJ *Excavations in Poole* 1973-83

Charleston RJ 1975 *Excavations in Medieval Southampton*, vol II. Leicester University Press

Charleston R.J. 1987 The Post-Medieval Glass, in S Frere and P Bennett, *Canterbury Excavations, Intra and Extra Mural sites 1949-55, 1980-84,* Canterbury: Canterbury Achaeol Trust.

Clapham A., Tutin T., and Moore D. 1987, *Flora of the British Isles. 3rd edition.* Cambridge University Press.

Cox, N. & Dannehl, K. (Eds). 2007. *Dictionary of Traded Goods and Commodities, 1550-1820*

Cuppen, J. G. M. 1983. On the habitats of three species of the genus *Hygrotus* Stephens (Coleoptera:Dytiscidae). *Freshwater Biology* 13, 579-588.

Davies, P, 2008 *Snails: archaeology and landscape change* Oxford. Oxbow Books

Denys, L. 1992. *A check list of the diatoms in the Holocene deposits of the Western Belgian Coastal Plain with a survey of their apparent ecological requirements: I. Introduction, ecological code and complete list.* Service Geologique de Belgique. Professional Paper No. 246. pp. 41.

Department of the Environment, 1990 *Planning Policy Guidance 16, Archaeology and Planning*

Dumbrell R. 1992 *Understanding Antique Wine Bottles.*

Ellenberg H 1988, *Vegetation Ecology of Central Europe*. 4th Edition. Cambridge

English Heritage, 1991 *Exploring our Past. Strategies for the Archaeology of England*, English Heritage

English Heritage, 1991 *Management of Archaeological Projects (MAP2)*

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

English Heritage, May 1998 *Capital Archaeology. Strategies for sustaining the historiclegacy of a world city*

English Heritage Greater London Archaeology Advisory Service, June 1998 *Archaeological Guidance Papers 1-5*

English Heritage Greater London Archaeology Advisory Service, May 1999 *Archaeological Guidance Papers 6*

Eyre, M. D., Pilkington, J. G., Carr, R., McBlane, R. P., Rushton, S. P. and Foster, G. N. (1993) The running-water beetles (Coleoptera) of a river catchment in northern England. *Hydrobiologia* 264, Number 1, 33-45.

Friday, L. E. 1988. A key to the adults of British water beetles. *Field Studies* 7, 1-151.

Gabriel R. 1974 *English Drinking Glasses.* Charles Letts & Co.

Godfrey, A. (2003) A review of the invertebrate interest of coarse woody debris in England. *English Nature Research Reports* 513.

Hansen, M. 1987. The Hydrophiloidea (Coleoptera) of Fennoscandia and Denmark. *Fauna Entomologica Scandinavica* 18, Leiden: Brill.

Hartley, B., H.G. Barber, J.R. Carter & P.A. Sims. 1996. *An Atlas of British Diatoms.* Biopress Limited. Bristol. pp. 601.

Henderson, P A, 1990 Freshwater ostracods *Linnean Society of London synopses of the British fauna no. 42*

Hayward, K.M.J. 2008 Worked stone. In Bradley, T & Butler, J. 2008; 96-97.

Hayward, P; Nelson-Smith, A; & Shields, C, 1996 *Seashore of Britain and Europe* London. HarperCollins.

History of Parliament Trust. 1802. Journal of the House of Commons Volume 2,

Holland, D. G. 1972. A key to the larvae, pupae and adults of the British species of Elminthidae. F*reshwater Biological Association Scientific Publication* 26.

Hulme I N 1976 *Artifacts of Colonial America.* New York.

Hustedt, F. 1953. Die Systematik der Diatomeen in ihren Beziehungen zur Geologie und Okologie nebst einer Revision des Halobien-systems. *Sv. Bot. Tidskr.*, 47: 509-519.

Hustedt, F. 1957. Die Diatomeenflora des Fluss-systems der Weser im Gebiet der Hansestadt Bremen. *Ab. naturw. Ver. Bremen* 34, 181-440.

Institute of Field Archaeologists (IFA), 2001 *By-Laws, Standards and Policy Statements of the Institute of Field Archaeologists (rev. 2001), Standard and guidance: excavation*

Institute of Field Archaeologists (IFA), supplement 2001, *By-Laws, Standards and Policy Statements of the Institute of Field Archaeologists: Standards and guidance – the collection, documentation conservation and research of archaeological materials*

Jessop, L. 1986. *Dung beetles and chafers. Coleoptera: Scarabaeoidea*. *Handbooks for the identification of British insects* 5 (11). London: Royal Entomological Society.

Kenward, H. K., Hall, A. R. and Jones, A. K. G. 1980. A tested set of techniques for the extraction of plant and animal macrofossils from waterlogged archaeological deposits, *Science and Archaeology,* 22, 3-15.

Kenward, H.K., Engleman, C., Robertson, A. and Large, F. (1986). Rapid scanning of urban archaeological deposits for insect remains. *Circaea* 3, 163-172.

Kerney, M, 1999 *Atlas of the land and freshwater molluscs of Britain and Ireland* Colchester. Harley Books

Kiesewalter 1888 see von den Driesch and Boesssneck

Killeen, I; Aldridge, D; & Oliver, G, 2004 Freshwater bivalves of Britain and Ireland *Field Studies Council Occasional Publication 82*

Kloet, G. A. and Hincks, W. D. 1964-77. *A checklist of British insects*, 2nd ed, London: Royal Entomological Society

Krammer, K. & H. Lange-Bertalot, 1986-1991. *Bacillariophyceae.*

Levine, M.A. 1982 The use of crown height measurements and eruption-wear sequences to age horse teeth. In B.Wilson, C.Grigson and S.Payne (eds.) *Ageing and Sexing Animal Bones from Archaeological Sites*, pp.223 – 250. BAR British Series 109.

Luff, M. L. 2007. *The Carabidae (ground beetles) of Britain and Ireland*. *Handbooks for the identification of British insects* 4 (2) 2nd ed. London: Royal Entomological Society.

Lysons, D. 1795. *The Environs of London*, Volume 2

Lysons, D. 1796. *The Environs of London*, Volume 4

Miller, P. & Saxby, D. 2007. The Augustinian Priory of St Mary Merton, Surrey: excavations 1976-90. MoLAS Monogr Ser 34, London

Macan, T T, 1977 A key to the British fresh- and brackish-water gastropods *Freshwater Biological Association scientific publication no. 13*

Mann, J (2008) Finds from the Well at St. Paul-in-the-Bail, Lincoln. *Lincoln Archaeological Studies* 9, 93-95

Margeson S, 1993. *The Medieval and Post-Medieval Finds from Norwich Survey Excavations*. East Anglian Archaeology 58.

MoLAS-PCA 2007a *Planning Delivery Zone 6: an archaeological desk based assessment.* Unpublished MoLAS-PCA report

MoLAS-PCA 2008, *Written Scheme of Investigation for Archaeological Evaluation Temple Mill Trench PDZ6.01* Unpublished MoLAS-PCA report

Murray, J W, 1979 British nearshore foraminiferids *Linnean Society of London synopses of the British fauna no. 16*

Museum of London, 1994 A*rchaeological Site Manual* 3rd ed

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

Osborne, P. J. (1988) A late Bronze Age insect fauna from the River Avon, Warwickshire, England: its implications for the terrestrial and fluvial environment and for climate. *Journal of Archaeological Science* 15, 715-727.

Oswald, A., 1975 *Clay pipes for the Archaeologist*, British Archaeological Reports, British series, No.14.

Page, W & Round, J.H. (Eds). 1907. *The Victoria County History of Essex,* Volume II. London: Archibald Constable & Co.

Powell, W.R. (Ed). 1966. *A History of the County of Essex*, Volume 5

Powell, W.R. (Ed). 1973. *A History of the County of Essex*, Volume 6

Robinson, M.A, Lambrick, G.H. (1984) Holocene alluviation and hydrology in the upper Thames basin *Nature,* Volume 310, Issue 5975, pp. 340.

Roman Finds Group and Finds Research Group AD700-1700 (1993) *The Guidelines for the Preparation of Site Archives for all finds other than fired clay vessels*

Schmid, E. 1972 *Atlas of Animal Bones.* Amsterdam: Elsevier Publishing Company.

Silver, I. A. 1971 The ageing of domestic animals pp.283 – 302 In D. Brothwell and E. Higgs (eds.) *Science in Archaeology.* New York: Thames & Hudson.

Schmid, E, 1972 *Atlas of animal bones for prehistorians, archaeologists and Quaternary geologists* London. Elsevier

Stace C. 2005, *New Flora of the British Isles2nd Edition*. Cambridge University Press. Cameron, R A D; & Redfern, M, 1976 British land snails *Linnean Society of London synopses of the British fauna no. 6*

Talbot O. 1974 The Evolution of Glass Bottles for Carbonated Drinks. Post-Medieval Archaeology, Volume 8.

Various. 1936. *Fifty Years a Borough. The County Borough of West Ham, 1886-1936.* Stratford: West Ham Corporation.

von den Driesch, A. 1976 *A Guide to the Measurement of Animal Bones from Archaeological Sites* Peabody Museum Bulletin 1.

von den Driesch, A. and Boessneck, J. 1974 Kritische Anmerkungen zue Widerristhöhenberechnung aus Langenmassen vor-und frűhgeschichlicher Tierknochen. *Saugetierkundliche Mitteilungen 22*: 325-348.

Werff, A. Van Der & H. Huls. 1957-1974 *Diatomeenflora van Nederland*, 10 volumes

Wills G. 1974 *English Glass Bottles 1650-1950.* John Bartholomew and Son Ltd.

Primary Sources

NB: text in this report draws from a representative sample of the consulted sources below

Hackney Archives

M793. Ruckholt Mill and Temple Mill, Assignment of Lease for 19 years, 2nd April 1601.

M807. Bargain & Sale: John Gwilliams, Gent and Abraham Baker, Gent of Low Leyton and his sons John, Tobias and Abraham Baker, 12th April 1622.

M796. Ruckholt Mills, alias Temple Mills, 3-Part Indenture, 10th August 1668.

M795. Ruckholt Mills, alias Temple Mills, Lease and Release 12th August 1668.

M1420. Copy Assignment of Mortgage (Lease and Release), 2nd March 1769.

M1424. Covenant to produce deeds, 16th October 1772.

M1425. Richard Leeds to William Turner, sale, 20th August 1812.

M1426. 3-part Indenture between Richard Leeds, William Turner and John Whitbread of Edmonton, sale of the White Hart and Flagery Mead and Osier Ground (not the Calico Works one), 21st August 1812.

M3562, Sale Particulars of the White Hart, 'Freehold Allotment Gardens' and Flagay Mead, 14th March 1899.

London Metropolitan Archives

ACC/2558/EL/A/02/B28/003/01-7. Deeds relating to purchase, 1755-1834.

ACC/2558/EL/A/3/014. Abstract of the title to a Freehold and Copyhold Estate called Rockholt otherwise Temple Mills and to certain lands near thereto called the Calico Grounds situate in the Parish of Hackney in the County of Middlesex and Lowlayton and Westham in the County of Essex. Received from Mr Sawyer, 9th December 1833.

ACC/2558/EL/A/33/020. 'Sundry Documents relating to the Settlement with Messrs Hale & Nicholson, May 1834.

ACC/2558/EL/A/3/013. William Wilson Esq. and his Trustees and Messrs John Basnett and Edward Chandler to the East London Waterworks Company: Lease for a Year, 11th December 1834.

ACC/2558/EL/A/02/B/21/06. Land at Temple Mills, 1834-6.

ACC/2423/P/0601. 1829 Commissioners of Sewers att. Hart, Crane & Allen. 1829.

ACC/2423/P/1702. New Reservoir and waterworks on Hackney Marsh 1824-5. 'Plans and Sections of a proposed new Water Company at Hackney'.

ACC/2423/P/1222 (1-4). Clay & Son, repairs to river wall at Temple Mills, March 1909.

ACC/2423/P/2050. 'County Borough of West Ham. Proposal widening Temple Mills Lane, suggested alterations to line of culvert, June 1926'.

ACC/2423/P/2069. 'G.W. Abbott's Estate Ditch at Temple Mills', May 1927.

ACC/2423/AL/098. Lee Conservancy Catchment Board. Works Authorised by the Lee Conservancy Catchment Board Act 1938. Contract No. 1 for the Widening of Portions of the River Lee and the Execution of Other Works in the Metropolitan Boroughs of Hackney, Poplar, the County Borough of West Ham and the Borough of Leyton

CLA/047/LR/07/022, a.k.a. PD/29/1. 'Second report of the local committee appointed at Stratford to consider the Floods of the River Lea', 31st May 1825.

CLA/036/02/1828/4/2, a.k.a. THC/C/1828/4/2. Petition to the Lord Mayor of 12 inhabitants of and near Stratford respecting obstructions to the navigation of the River Lea at Bromley Lock, the bridge at Three Mills, Bow Bridge and the Channelsea Stream, 1828.

CLA/036/02/1828/4/3, a.k.a. THC/C/1828/4/3. 'A Reduced Copy of the Plan of the River Lea'. 1825/8.

The National Archives

TNA RAIL 845/11 Lee Conservancy Board Minutes Volume 8, 1832-1840

TNA RAIL 845/12 Lee Conservancy Board Minutes Volume 9, 1840-1847

TNA RAIL 845/13 Lee Conservancy Board Minutes Volume 10, 1847-1850

TNA RAIL 845/14 Lee Conservancy Board Minutes Volume 11, 1850-1858

TNA RAIL 845/15 Lee Conservancy Board Minutes Volume 12, 1859-1864

TNA RAIL 845/16 Lee Conservancy Board Minutes Volume 13, 1864-1869

TNA RAIL 845/17 Lee Conservancy Board Minutes Volume 14, 1869-1870

TNA RAIL 845/18 Lee Conservancy Board Minutes Volume 15, 1871-1872

TNA RAIL 845/19 Lee Conservancy Board Minutes Volume 15, 1872-1873

TNA RAIL 845/20 Lee Conservancy Board Minutes Volume 15, 1874-1876

TNA RAIL 845/21 Lee Conservancy Board Minutes Volume 18, 1877-1879

TNA RAIL 845/22 Lee Conservancy Board Minutes Volume 18, 1879-1880

TNA RAIL 845/23 Lee Conservancy Board Minutes Volume 20, 1881-1884

TNA RAIL 845/24 Lee Conservancy Board Minutes Volume 21, 1885-1887

TNA RAIL 845/25 Lee Conservancy Board Minutes Volume 22, 1888-1890

TNA RAIL 845/26 Lee Conservancy Board Minutes Volume 23, 1891-1892

TNA RAIL 845/27 Lee Conservancy Board Minutes Volume 24, 1893-1894

TNA RAIL 845/28 Lee Conservancy Board Minutes Volume 25, 1895-1897

TNA RAIL 845/29 Lee Conservancy Board Minutes Volume 26, 1898-1900

TNA RAIL 845/30 Lee Conservancy Board Minutes Volume 27, 1901-1902

TNA RAIL 845/31 Lee Conservancy Board Minutes Volume 28, 1903-1904

TNA RAIL 845/32 Lee Conservancy Board Minutes Volume 29, 1905-1906

TNA RAIL 845/33 Lee Conservancy Board Minutes Volume 29 Part II, 1905-1906

TNA RAIL 845/34 Lee Conservancy Board Minutes Volume 30, 1907

TNA RAIL 845/35 Lee Conservancy Board Minutes Volume 31, 1908

TNA RAIL 845/36 Lee Conservancy Board Minutes Volume 32, 1909

TNA RAIL 845/36 Lee Conservancy Board Minutes Volume 33, 1910

TNA RAIL 845/38 Lee Conservancy Board Minutes Volume 34, 1911

TNA RAIL 845/39 Lee Conservancy Board Minutes Volume 35, 1912

TNA RAIL 845/40 Lee Conservancy Board Minutes Volume 36, 1913

TNA RAIL 845/41 Lee Conservancy Board Minutes Volume 37, 1914

TNA RAIL 845/42 Lee Conservancy Board Minutes Volume 38, 1915

TNA RAIL 845/43 Lee Conservancy Board Minutes Volume 39, 1916

TNA RAIL 845/44 Lee Conservancy Board Minutes Volume 40, 1917

TNA RAIL 845/45 Lee Conservancy Board Minutes Volume 41, 1918

TNA RAIL 845/46 Lee Conservancy Board Minutes Volume 41, 1919

TNA RAIL 845/47 Lee Conservancy Board Minutes Volume 42, 1920

TNA RAIL 845/48 Lee Conservancy Board Minutes Volume 43, 1921

TNA RAIL 845/49 Lee Conservancy Board Minutes Volume 45, 1922

TNA RAIL 845/119 Lee Conservancy Board Minutes Volume 58, 1935

TNA RAIL 845/120 Lee Conservancy Board Minutes Volume 59, 1936

TNA RAIL 845/121 Lee Conservancy Board Minutes Volume 60, 1937

TNA HLG 23/13361. County Borough of West Ham, White Hart Cottages: Housing Confirmation Order, 25th October 1937.

TNA HLG 50/49. River Lee Pollution File, 1921-1923.

TNA HLG 50/50. River Lee: General File 1930-1932.

TNA HLG 50/52 River Lee Tributaries in Middlesex. Prevention of pollution, jurisdiction of L.C.B. and Middlesex County Council, 1923-1928.

TNA HLG 50/57. River Lee Backwaters Flood Prevention Scheme, 1930-1932.

TNA AN 13/417. River Lee Flood Prevention Work Lee Conservancy Catchment Board Act 1938 (1950).

TNA ELR 14/752. Granter the Queen, Grantee Edward Bigge, gent. Demise for 40 Years, 1575-6.

Newham Archives and Local Studies Library

Clayton, J. 1821. Survey of the Parish of West Ham in the County of Essex.

Minutes of the Joint Committee of the River Lee Flood Relief Scheme, 1930. Nos. 40-76.

Parliamentary proceedings and committees

Minutes of Evidence, taken before the Select Committee on the Supply of Water to the Metropolis, 1821.

Report of the Commissioners Appointed by His Majesty to inquire into the State of the Supply of Water in The Metropolis, 1828.

Report From Select Committee on Metropolis Water, 1834.

Correspondence between the Board of Trade and the East London Waterworks Company with reference to Captain Tyler's Report on the Water supplied by the Company, 1867.

Trade & Street Directories

Commercial Directory of Essex, Hertfordshire, Kent, Middlesex, Surrey & Sussex. 5th Edition, 1832-4. London: Pigot and Company.

History, Gazetteer and Directory of the County of Essex, 1st Edition, 1848. London: William White.

Kelly's Post Office Directory of Essex, Hertfordshire, Kent, Middlesex, Surrey & Sussex, 1862. London: Kelly & Co.

History, Gazetteer and Directory of the County of Essex, 2nd Edition, 1863. London: William White.

Kelly's Post Office Directory of Forest Gate, Leyton, Leytonstone, Plaistow &c, 1888-9. London: Kelly & Co.

Kelly's Post Office Directory of Essex, 1890. London: Kelly & Co.

Kelly's Post Office London Directory, Local Section. London: Kelly's, 1900-1.

Kelly's Post Office Directory of Essex, Hertfordshire & Middlesex, 1908. London: Kelly & Co.

Kelly's Post Office Directory of Essex, Hertfordshire & Middlesex, 1912. London: Kelly & Co.

Census Returns

1861 Census, West Ham Enumeration District No. 12.

1871 Census, West Ham Enumeration District No. 15.

1881 Census, West Ham Enumeration District No. 19.

1891 Census, West Ham, Stratford Enumeration District No. 17.

1901 Census, West Ham, Stratford Enumeration District No. 24.

11 NMR OASIS archaeological report form

OASIS ID: preconst1-58261	
Project details	
Project name	Temple Mill Trench (PDZ6.01), OlympicPark.
Short description of the project	The natural deposits of gravel and sands were in places overlain by peat deposits. A sequence of alluvium *c*1.50m thick covered the natural sands and the peat layers. Within the alluvium silted up channels that are likely to be ancient tributaries of the River Lea were recorded. Buried within the alluvium was the earliest structure found on the site two parallel lines of timber piles that may have supported an elevated walkway that traversed a waterlogged or marshy area and may date to the 16th century. By the 17th century in the area of the site the land had been reclaimed from the marsh The excavation unearthed a narrow stream reveted with timber that was probably the millrace and the remains of a brick built building probably the foundry. A water channel on the east side of the site the western bank of which was probably reveted with timber as early as the 17th century. This channel has been identified as the historically documented Tumbling Bay Stream, a waterway that would remain open until the early 20th century. A row of terraced cottages that were revealed on the western side of the site. The remains of probably two other commercial/industrial buildings were also found. In the 19th century the west bank of the Tumbling Bay Stream was rebuilt and the ground level across the site raised and a cobbled road and stone pavement laid.
Project dates	Start: 06-05-2008 End: 02-07-2008
Previous/future work	Not known/No
Any associated project reference codes	OL-06507 - Sitecode
Type of project	Field evaluation
Site status	Area of Archaeological Importance (AAI)
Current Land use	Vacant Land 1 - Vacant land previously developed
Monument type	POST ALLIGNMENT Post Medieval
Monument type	FOUNDRY Post Medieval

Monument type	MILL RACE Post Medieval
Monument type	TERRACED HOUSES Post Medieval
Monument type	COBBLED ROAD Modern
Monument type	STREAM Post Medieval
Monument type	REVETMENT Post Medieval
Significant Finds	POTTERY Medieval
Significant Finds	POTTERY Post Medieval
Significant Finds	CLAY TOBACCO PIPE Post Medieval
Significant Finds	GLASS Post Medieval
Methods & techniques	'Augering','Environmental Sampling','PhotographicSurvey','Targeted Trenches'
Development type	Publicbuilding (e.g. school, church, hospital, medical centre, law courts etc.)
Prompt	Planning condition
Position in the planning process	After full determination (eg. As a condition)
Project location	
Country	England
Site location	GREATER LONDON NEWHAM NEWHAM Phased Summary and Assessment Document of the Excavation At The Temple Mill Trench (PDZ6.01), OlympicPark
Study area	875.00 Square metres
Site coordinates	TQ 3761 8542 51.5503694999 -0.01504073566980 51 33 01 N 000 00 54 W Point

Height OD/Depth	Min: 1.52m Max: 4.75m
Project creators	
Name of Organisation	PCA/Molas
Project brief originator	GLAAS
Project design originator	David Divers
Project director/manager	Gary Brown
Project supervisor	Alistair Douglas
Type of sponsor/funding body	OlympicDelivery Authority
Name of sponsor/funding body	Capita Symonds
Entered by	Alistair Douglas (adouglas@pre-construct.com)
Entered on	17 April 2009

12 Appendix 1: Context index

Context No	Grid Sq	Plan	Section	Type	Description
1	100/195	Pre-ex		Layer	Tarred surface
2	105-110/195 105-110/200 105-110/205 100-110/210-230	Pre-ex	2, 17, 21	Layer	Metalled surface
3	100-105/195-200	Pre-ex		Layer	Silty sand
4	100-105/195-200	Pre-ex		Layer	Sandy silt
5	100-105/200-205	Pre-ex		Layer	External brick surface
6	100-105/200-205	Pre-ex		Layer	Trample
7	100/205	Pre-ex		Masonry	External east-west aligned south wall
8	100/205-230	Pre-ex	17, 21	Masonry	Flagstone pavement
9	115/195-200		1	Fill	Fill of cut [10]
10	115/195-200		1	Cut	
11	115/195-200		1	Layer	Made ground
12	115/195-200		1	Layer	Made ground
13	115/195-200		1	Layer	Made ground
14	115/195-200		1	Layer	Alluvium
15	100/205-230	Pre-ex		Masonry	north-south external wall
16	105/210-215	Pre-ex		Layer	Metalled surface
17	100/210	Pre-ex		Masonry	east-west internal wall
18	100/210	Pre-ex		Masonry	east-west internal wall
19	100/210	Pre-ex		Masonry	east-west internal wall
20	100/215	Pre-ex		Masonry	east-west internal wall - to support floor?
21	100/215	Pre-ex		Masonry	east-west internal wall
22	100/215	Pre-ex		Masonry	east-west internal wall
23	100/215	Pre-ex		Masonry	east-west internal wall
24	100/215	Pre-ex		Masonry	east-west internal wall
25	100/215	Pre-ex		Masonry	Concrete - threshold
26	100/210 100/220-225	Pre-ex, 26	17	Layer	Bedding layer for [8]
27	100/220	Pre-ex, 27		Masonry	east-west internal wall
28	100/220	Pre-ex, 28		Masonry	east-west internal wall
29	100/220	Pre-ex, 29		Masonry	east-west internal wall
30	100/220	Pre-ex, 30		Masonry	east-west internal wall
31	100/220	Pre-ex, 31		Masonry	east-west internal wall
32	100/215-225	Pre-ex		Layer	Demolition

Context No	Grid Sq	Plan	Section	Type	Description
33	120/195-205	Pre-ex		Timber	Revetment
34	100/215	Pre-ex		Masonry	east-west internal wall
35	100/215	Pre-ex		Masonry	east-west internal wall
35	100/225	Pre-ex		Masonry	east-west internal wall
36	100/225	Pre-ex		Masonry	Concrete - threshold
36	100/225	Pre-ex		Masonry	Concrete - threshold
37	100/225	Pre-ex		Masonry	east-west internal wall
38	100/225	Pre-ex		Masonry	east-west internal wall
39	100/225	Pre-ex		Masonry	
40	100/225	Pre-ex		Masonry	Repair to [8]
41	100/210-215	Pre-ex		Masonry	NW/SE internal wall
42	120/195-200	Pre-ex		Fill	Backfill on landward side to revetment [33]
43	115-120/195-205	Pre-ex	5	Fill	Backfill on landward side to revetment [33]
44	105/230		2	Layer	Metalled surface
45	105/230		2	Layer	Made ground
46	105/230		2	Layer	Made ground
47	105/230		2	Layer	Made ground
48	105/230		2, 3	Layer	Possible metalled surface
49	105/230		2	Layer	Levelling
50	105/230		2	Fill	Fill of cut [51]
51	105/230		2	Cut	
52	105/230		2	Layer	Made ground
53	105/230		2	Layer	Made ground
54	105/230		2	Layer	Demolition
55	120-125/195-200	Pre-ex		Fill	Modern fill of channel
56	100/220-225	Pre-ex		Fill	Fill of construction cut [57]
57	100/220-225	Pre-ex		Cut	Construction cut for [15]
58	100/230	Pre-ex	3	Masonry	External east-west north wall
59	100/230		3	Layer	Bedding layer for [8]
60	100/230		3	Layer	Made ground
61	100/230		3	Layer/fill	Silty clay
62	100/225	Pre-ex		Masonry	
63	100/220	Pre-ex, 63-missing		Masonry	
64	100/220	Pre-ex, 64		Masonry	
65	110-115/195-230	Pre-ex		Layer	Cobbled road
66	115/225		4	Layer	Made ground
67	115/225		4	Layer	Made ground
68	115/225		4	Layer	Demolition
69	115/225		4	Fill	Fill of cut [70]
70	115/225		4	Cut	
71	115/225		4	Fill	Fill of cut [72]
72	115/225		4	Cut	
73	115/225		4	Layer	Made ground

Context No	Grid Sq	Plan	Section	Type	Description
74	110/205	Pre-ex		Fill	Backfill
75	110/205	Pre-ex		Fill	Fe pipe
76	110/205	Pre-ex		Cut	Cut for pipe [75]
77	100/210	Pre-ex		Cut	Modern intrusion
78	115/215-230	Pre-ex		Layer/fill	Backfill behind revetment [81]
79	115/215-230	Pre-ex		Layer/fill	Modern fill of channel
80	115/220	80	26, 39	Cut	Construction cut for [81]
81		Pre-ex		Timber	Revetment
82	115-120/195-210	Pre-ex	5	Cut	Construction cut for [33]
83	100/210	Pre-ex		Masonry	east-west internal wall
84	100/210	Pre-ex		Masonry	east-west internal wall
85	100/210	Pre-ex		Masonry	Concrete & brick - threshold
86	100/210	Pre-ex		Masonry	Brick - threshold
87	100/225	Pre-ex		Masonry	east-west internal wall
88	100/225	Pre-ex		Masonry	east-west internal wall
89	115/200-205	Pre-ex		Fill	Backfill of cut [82]
90	115/200			Fill	Fill of cut [91]
91	115/200	91		Cut	Posthole
92	120/220-230	Pre-ex	22	Layer	Clay channel bank
93	120/220-230	Pre-ex	22	Layer	Silty clay channel bank
94	120/220-230	Pre-ex	22	Layer/fill	Fill of channel
95	120/220-230	Pre-ex	22	Layer/fill	Consolidation of channel bank
96	120/220	Pre-ex		Layer	Silty clay
97	105/225			Fill	Fill of cut [98]
98	105/225	98		Cut	Posthole
99	115/200			Fill	Fill of cut [100]
100	115/200	100		Cut	Posthole
101	105/220			Fill	Fill of cut [102]
102	105/220	102		Cut	Posthole
103	105/230			Fill	Fill of cut [104]
104	105/230	104		Cut	Posthole
105	120/220-230	Pre-ex	22	Layer/fill	Consolidation of channel bank
106	105/230			Fill	Fill of cut [107]
107	105/230	104		Cut	Posthole
108	120/220	108	22	Cut	East side of channel
109	105/220			Fill	Fill of cut [110]
110	105/220	102		Cut	Posthole
111	105/225			Fill	Fill of cut [112]
112	105/225	98		Cut	Posthole
113	120/220			Fill	Fill of cut [116]
114	105/215			Fill	Fill of cut [115]
115	105/215	115		Cut	Posthole
116	120/220	116		Cut	
117	100/205-230	Pre-ex, 117	17, 21	Masonry	Edging
118	120/225-230	Pre-ex		Layer/fill	Silty clay and broken brick

Context No	Grid Sq	Plan	Section	Type	Description
119	105/210			Fill	Fill of cut [120]
120	105/210	120		Cut	Posthole
121	100/210			Fill	Backfill to construction cut [122]
122	100/210			Cut	Construction cut for [18]
123	105/210			Fill	Fill of cut [124]
124	105/210	120		Cut	Posthole
125	105/210			Timber	Post tip
126	100/220	126		Layer	Bedding layer for [8]
127	100/210			Fill	Backfill to cut [128]
128	100/210	128		Cut	Construction cut for [117]
129	100/210	129		Layer	Make-up
130	100/210	130		Masonry	Brick threshold
131	100/205-230	Pre-ex	17, 21	Masonry	Granite curb stones
132	100/210			Layer	Levelling
133	100/210	133		Cut	Construction cut for curb stones [131]
134	100/210			Fill	Backfill to cut [135]
135	100/210	130		Cut	Construction cut for [130]
136	100/220			Fill	Backfill to cut[137]
137	100/220	137		Cut	Construction cut for [29]
138	100/210			Fill	Backfill to cut [139]
139	100/210	139		Cut	Cut for gas pipe
140	120/220	140		Layer/fill	Fill of channel
141	105/220			Fill	Fill of cut [142]
142	105/220	102		Cut	Posthole
143	100-105/210	143		Layer	Gravel
144	100/220			Fill	Fill of cut [148]
145	100/220			Fill	Fill of cut [148]
146	105/215			Fill	Fill of cut [147]
147	105/215			Cut	Posthole
148	100/220	148		Cut	Cut for gas pipe
149	105/215			Fill	Gas pipe
150	100-105/210	150		Layer	
150	100-105/210			Layer	
151	105/215			Fill	Fill of cut [152]
152	105/215	115		Cut	Posthole
153	105/220			Fill	Fill of cut [154]
154	105/220	102		Cut	
155	100-105/200		11	Layer	Brick surface
156	100/200		11	Layer	Sandy silt
157	100-105/200		11	Layer	Levelling
158	100-105/200 105/195		11, 12	Layer	Made ground
159	100-105/200 105/195		11, 12	Layer	Made ground
160	100-105/195-200		11, 12	Layer	Made ground
161	105/195-200		12	Layer	Made ground
162	115/225		4	Layer	Made ground

Context No	Grid Sq	Plan	Section	Type	Description
163	115/225		4	Layer	Demolition
164	100/195	160	13	Fill	Fill of cut [165]
165	100/195	160	13	Cut	
166	100/195		13, 14	Layer	Alluvium
167	100/195		13	Layer	Alluvium
168	100/195		13	Layer	Fine sandy clay
169	100/195		13, 14	Fill	Fill of cut [170]
170	100/195		13, 14	Cut	
171	100-105/195-200		13, 14, 15	Layer	Alluvium
172	100/195-200	160	14	Layer	Silty clay
173	100/195-200	160	14, 15	Fill	Fill of cut [175]
174	100/195-200		14	Fill	Fill of cut [175]
175	100/195-200	160	14, 15	Cut	
176	100/200		14, 15	Layer	Alluvium
177	100/195		14	Layer/fill	Silty clay
178	100-105/200		14, 15	Layer	Alluvium
179	100/200		15	Fill	Top fill of barrel
180	100/200		15	Fill	Fill of barrel
181	100/200		15	Fill	Fill of barrel
182	100/200		15	Timber	Barrel
183	100/200		15	Fill	Backfill
184	100/200		15	Cut	Cut for barrel [182]
185	100-105/200	160	15	Layer	Made ground
186	100-105/200		15	Layer	Made ground
187	100-105/200		15	Layer	Made ground
188	100-105/200		15	Layer	Alluvium
189	100-105/200	160	15	Layer/fill	Fill of cut [190]
190	100-105/200	160	15	Cut	Tree throw?
191	105/210	191		Layer	Rough surface
192	105-110/210	192		Layer	Gravel
193	100/210	193	27	Layer	Levelling
194	100-105/195		13	Cut	
195	100/195-200		13, 14	Layer	Alluvium
196	100/210	196	27	Layer	Levelling
197	100/210	197		Layer	Made ground
198	100-110/210	198	27	Layer	Made ground
199	100/195			Fill	Fill of cut [201]
200	100-105/200	160	11	Layer	Made ground
201	190/195	201, 160		Cut	Pit
202	115/220		26, 39	Fill	Fill of channel
203	100-105/220			Fill	Backfill
204	105-110/215-220	204	21	Masonry	Drain
205	100-195/220	205		Cut	Construction cut for [204]
206	115/220		26, 39	Fill	Backfill
207	100-105/220			Fill	Internal fill drain [204]
208	105/210			Fill	Fill of cut [209]
209	105/210	209		Cut	Gully
210	105/210	210		Layer	Levelling

Context No	Grid Sq	Plan	Section	Type	Description
211	100/195-200	160		Layer	Sandy gravel
212	115/220	212	26, 39	Cut	Bank behind revetment
213	115/220		26, 39	Fill	Deliberate infilling of cut [212]
214	115/220		26, 39	Fill	Made ground behind revetment [81]
215	115-120/220		22	Fill	Fill of channel
216	100/210			Fill	Fill of cut [217]
217	100/210	217		Cut	Posthole
218	100/210			Fill	Fill of cut [219]
219	100/210	219		Cut	Posthole
220	100/210			Fill	Fill of cut [221]
221	100/210	221		Cut	Posthole
222	100/210			Fill	Fill of cut [223]
223	100/210	223		Cut	Posthole
224	100/210			Fill	Fill of cut [225]
225	100/210	225		Cut	Posthole
226	100/210			Fill	Fill of cut [227]
227	100/210	227		Cut	Posthole
228	100/210			Fill	Fill of cut [229]
229	100/210	229		Cut	Posthole
230	115/220	230		Cut	Rectangular pit
231	115/220			Fill	Fill of cut [230]
232	105/220			Fill	Fill of cut [233]
233	105/220	233		Cut	Stakehole
234	105/220			Fill	Fill of cut [235]
235	105/220	233		Cut	Stakehole
236	105/220			Fill	Fill of cut [237]
237	105/220	233		Cut	Stakehole
238	115/220	238	22	Layer/fill	Sandy silty gravel
239	100-105/210			Fill	Lower fill of cut [209]
240	105/210			Fill	Fill of barrel
241	105/210			Timber	Base of barrel
242	105/210	242		Cut	Construction cut
243	105-110/220	243		Layer	
244	105/220	243		Layer	
245	105/220-225			Fill	Fill of cut [246]
246	105/220-225	246		Cut	Linear gully?
247	115/220	247	22	Layer/fill	Redeposited yellow clay
248	105/210			Fill	Backfill
249	105/210	249		Timber	Barrel
250	100-110/220	243		Layer	Made ground
251					VOID
252	110/210			Fill	Upper fill of barrel [255]
253	110/210			Fill	Fill of barrel [255]
254	110/210			Fill	Backfill
255	110/210	255		Timber	Barrel
256	110/210	256		Cut	Cut for barrel [255]
257	120/220	257	22	Layer/fill	Fill of channel
258	110/220		16	Layer	Bedding layer for [65]

Context No	Grid Sq	Plan	Section	Type	Description
259	110/220	259	16	Layer	Make-up
260	110/220	260	16	Layer	Made ground
261	115/220		16	Layer	Made ground
262	110-115/220		16	Fill	Backfill
263	110/220	260	16	Cut	Construction cut for [318]
264	110-115/220	264	16, 17	Layer	Sandy silt
265	110-115/220	260	16, 17	Fill	Backfill
266	110/220	260	16, 17	Cut	Construction cut for tie-back
267	115/220		16	Layer	Silty clay
268					VOID
269	100-105/220		18	Layer	Alluvium
270	100-105/220		20	Layer	Alluvium
271	100-105/220		18	Layer	Alluvium
272	100-105/220		18	Layer	Alluvium
273	100/220	281	19	Fill	Fill of cut [274]
274	100/220	281	19	Cut	Drain
275	105/195-200		12	Layer	Silty sand
276	105/210			Fill	Fill of barrel [277]
277	105/220	277		Timber	Barrel
278	105/220	278		Cut	Cut for barrel [277]
279	105/210	279		Layer	Context sheet missing
280					Context sheet missing
281	100-115/220	281	18, 17, 21	Layer	Silty clay
282	100-105/220		18	Layer	Alluvium
283					VOID
284					VOID
285	100/220		17	Layer	Make-up
286	100-110/220		21	Layer	Made ground
287	100/220		17, 21	Layer	Sandy gravel
288	100-105/220		17, 21	Layer	Made ground
289	100-105/220		17, 21	Layer	Made ground
290	100/220		17	Layer	Bedding layer for curb stones
291	100/220		17	Layer	Bedding layer for curb stones
292	110/220		17	Layer	Made ground
293	100-110/200-215	293		Layer	Alluvial clay - Context sheet missing
294	105/210			Fill	Fill of cut [295]
295	105/210	295		Cut	Robber trench
296	105/210			Fill	Fill of cut [297]
297	105/210			Cut	Robber trench
298	105/210			Fill	Fill of cut [299]
299	105/210	299		Cut	Posthole
300	100/220		17, 21	Layer	Silty sand
301	100/220		17	Layer	Sandy silt
302	100-105/210	302		Layer	Mortar
303	105/210			Fill	Fill of cut [304]
304	105/210	304		Cut	Posthole

Context No	Grid Sq	Plan	Section	Type	Description
305	105/210			Fill	Fill of cut [306]
306	105/210	306		Cut	Posthole
307	120/220	108	41	Layer	Alluvium - Context sheet missing
308	120/220	108		Layer/fill	Alluvium
309	120/220	108		Layer/fill	Alluvium
310	115/220	310		Cut	Rectangular pit
311	115/220			Fill	Fill of cut [310]
312	115/220	312	23	Cut	Pit
313	115/220		21, 23	Fill	Fill of cut [312]
314	105/210			Fill	Fill of cut [315]
315	105/210	315		Cut	Posthole
316	110/220	316	17	Timber	Anchor for tie-back
317	110-115/220	316	16	Fill	Tie-back
318	110-115/220	316	16	Fill	Tie-back
319	110/220	264		Cut	Posthole
320	110/220			Fill	Fill of cut [319]
321	110/220	264		Cut	Posthole
322	110/220			Fill	Fill of cut [321]
323	110/220	264		Cut	Posthole
324	110/220			Fill	Fill of cut [323]
325	110/220	264		Cut	Posthole
326	110/220			Fill	Fill of cut [325]
327	110/220	264		Cut	Posthole
328	110/220			Fill	Fill of cut [327]
329	110/220	264		Cut	Posthole
330	110/220			Fill	Fill of cut [329]
331	105/205-215			Fill	Fill of cut [332]
332	105/205-215	332		Cut	Gully
333	100-105/210	333		Layer	Made ground
334	100/210		27	Fill	Backfill to construction cut [135]
335	100/210	335	27	Cut	Construction cut for [15]
336	105/210			Fill	Fill of cut [337]
337	105/210	337		Cut	Posthole
338	105/210			Fill	Degraded wooden post
339	105/210	339		Cut	Posthole
340	105/210		27	Fill	Fill of cut [341]
341	105/210	341	27	Cut	Posthole
342	105/210	342	27	Layer	Silty clay with high % of charcoal
343	105/210-215		27	Fill	Fill of cut [344]
344	105/210-215	344, 556	27	Cut	Posthole
355	105/220	281		Layer	Alluvium
356	105/210			Fill	Backfill
357	100/220	357		Layer	Demolition
358	115/220			Timber	Post driven into [281]
359	115/220			Timber	Post driven into [281]
360	105/220		21	Layer	Made ground
361	105/220		21	Layer	Made ground

Context No	Grid Sq	Plan	Section	Type	Description
362	105/220		21	Layer	Made ground
363	105/220		21	Layer	Made ground
364	115/220			Fill	Fill of cut [365]
365	115/220	365		Cut	Circular pit
366	110/220			Fill	Fill of cut [367]
367	110/220	367		Cut	Posthole
368	110/220			Fill	Fill of cut [369]
369	110/220	369		Cut	Posthole
370	105/210			Fill	Fill of cut [371]
371	105/210	371		Cut	Posthole
374	105/210			Fill	Fill of cut [375]
375	105/210	375		Cut	Posthole
376	115/220	108	26, 39	Layer/fill	
377	115/220		26, 38, 39	Cut	River channel
378	105/220		21	Layer/fill	Bedding for [131]
379	105/220		21	Layer	Made ground
380	110/220		17, 21	Layer	Made ground
381	110/220		17	Layer	Made ground
382	110/220		17, 21	Layer	Made ground
383	110/220		17	Layer	Made ground
384	110/220		17	Layer	Made ground
385	115/230		8, 24		Fe tie-back
386	115-120/205		25		Fe tie-back
387	105/210			Fill	Fill of cut [388]
388	105/210	388		Cut	
389	105/210	389		Layer	Demolition
390	120/220	Pre-ex		Metal	Corrugated iron revetment
391	120/220		22	Fill	Fill of channel
392	105/210			Fill	Fill of cut [393]
393	105/210			Cut	Gully
394	105/210	394	27	Layer	Organic
395	100-105/210	395	27	Layer	Organic
396	115/220			Fill	Fill of cut [397]
397	115/220	397		Cut	Posthole
398	115/220			Fill	Fill of cut [399]
399	115/220	247		Cut	Posthole
400	115/220			Fill	Fill of cut [401]
401	115/220	247		Cut	Posthole
402	115/220			Fill	Fill of cut [403]
403	115/220	247		Cut	Posthole
404	115/220			Fill	Fill of cut [405]
405	115/220	247		Cut	Posthole
406	115/220		21	Layer	Made ground
407	105/210	407		Masonry	Brick surface
408	115/220			Fill	Fill of cut [409]
409	115/220	281		Cut	Stakehole
410	115/220			Fill	Fill of cut[412]
411	115/220	281		Cut	Stakehole

Context No	Grid Sq	Plan	Section	Type	Description
412	115/220			Fill	Fill of cut [413]
413	115/220	281		Cut	Stakehole
414	115/220			Fill	Fill of cut [415]
415	115/220	281		Cut	Stakehole
416	115/220			Fill	Fill of cut [417]
417	115/220	281		Cut	Stakehole
418	115/220			Fill	Fill of cut [419]
419	115/220	281		Cut	Stakehole
420	115/220	281		Timber	Post
421	115/220			Fill	Fill of cut [422]
422	115/220	281		Cut	Stakehole
423	115/220			Fill	Fill of cut [424]
424	115/220	281		Cut	Posthole
425	110220			Fill	Fill of cut [426]
426	110220	281		Cut	Stakehole
427	110220			Fill	Fill of cut [428]
428	110220	281		Cut	Posthole
429	110220			Fill	Fill of cut [430]
430	110220	281		Cut	Posthole
431	110220			Fill	Fill of cut [432]
432	110220	281		Cut	Posthole
433	110220			Fill	Fill of cut [434]
434	110220	281		Cut	Posthole
435	110220			Fill	Fill of cut [436]
436	110220	281		Cut	Posthole
437	110220			Fill	Fill of cut [438]
438	110220	281		Cut	Posthole
439	110220			Fill	Fill of cut [440]
440	110220	281		Cut	Posthole
441	105-110/210	441		Masonry	east-west wall
442	105/205-210	442		Masonry	north-south wall
443	110/220			Fill	Fill of cut [444]
444	110220	281		Cut	Posthole
445	115/220			Fill	Fill of cut [446]
446	115/220	281		Cut	Posthole
447	115/220			Fill	Fill of cut [448]
448	115/220	281		Cut	Posthole
449	110/220			Fill	Fill of cut [450]
450	110/220	281		Cut	Posthole
451	110/220			Fill	Fill of cut [452]
452	110/220	281		Cut	Stakehole
453	110/220			Fill	Fill of cut [454]
454	110/220	281		Cut	Stakehole
455	110/220			Fill	Fill of cut [456]
456	110/220	281		Cut	Stakehole
457	105-110/210		27	Layer	Made ground
458	105/210		27	Layer	Gravel - recorded only in section
459	115/220			Fill	Fill of cut [460]

Context No	Grid Sq	Plan	Section	Type	Description
460	115/220	281		Cut	Stakehole
461	100/205	Pre-ex, 261		Masonry	Soakaway
462	110/220			Fill	Fill of [463]
463	110/220	281		Cut	Stakehole
464	110/220			Fill	Fill of cut [465]
465	110/220	281		Cut	Stakehole
466	110/220			Fill	Fill of cut [467]
467	110/220	281		Cut	Stakehole
468	110/220			Fill	Fill of cut [469]
469	110/220	281		Cut	Stakehole
470	110/220			Fill	Fill of cut [471]
471	110/220	281		Cut	Stakehole
472	100/205			Fill	Fill of soakaway [461]
473	105/210			Fill	Fill of sunken brick feature [490]
474	105/210			Fill	Fill of cut [475]
475	105/210	475		Cut	Robber trench
476	110/220			Fill	Fill of cut [477]
477	110/220	281		Cut	Stakehole
478	110/220			Fill	Fill of cut [479]
479	110/220	281		Cut	Posthole
480	110/220		17	Layer	Made ground
481	110/220-225		26	Fill	Fill of cut [482]
482	110/220-225		26	Cut	Possible posthole
483	120/220	483, 108		Timber	Tree stump
484	120/220	484, 108		Timber	Tree stump
485	120/220	485, 108		Timber	Tree stump
486	105/210			Fill	Fill of [487]
487	105/210	487		Cut	Posthole
488	105/210			Layer/fill	Demolition
489	105/210			Layer/fill	
490	105/210	490		Masonry	Sunken brick feature
491	110/220		26	Layer/fill	Made ground
492	110/220		26	Cut	Tip line
493	115/220			Timber	Post - part of earlier revetment
494	105/210		27	Layer	Made ground
495	105/210		27	Fill	Fill of cut [497
496	105/210		27	Cut	
497	105/210		27	Fill	Fill of cut [498]
498	105/210		27	Cut	
499	105-110/210		27	Layer	Made ground
500	115/220			Timber	Post
501	110/210		27	Layer	Made ground
502	105-110/210		27	Layer	Made ground
503	105/210		27	Layer	Made ground
504	105/210		27	Fill	Fill of cut [278]
505	105/210		27	Fill	Fill of cut [278] - context sheet missing

Context No	Grid Sq	Plan	Section	Type	Description
506	100-105/210-215		30	Fill	Fill of cut [684]
507	100-105/215	507		Masonry	Drain
508	105-110/215	508		Masonry	Drain
509	100-105/215	509		Cut	Construction cut for [507]
510	105-110/215	510		Cut	Construction cut for [508]
511					VOID
512					VOID
513					VOID
514	100-105/215			Fill	Fill of drain
515	105/210			Layer/fill	Sooty deposit
516	100/210			Fill	Fill of cut [517]
517	100/210	517		Cut	Posthole
518	110/215	518		Timber	Post - not ex
519	110/215	519		Timber	Post - not ex
520	100/215	520		Masonry	Part of threshold
521	105-110/215			Fill	Backfill
522	100/215	523		Masonry	Part of threshold
523	100/215	523		Timber	Threshold
524	100/215-220	524		Masonry	
525	100-105/215			Fill	Backfill
526	105/205	526		Layer	Demolition?
527	105/205	527		Masonry	north-south wall
528	105/200	528		Masonry	east-west wall
529	100-105/205 105/200	529		Masonry	north-south wall
530	110/205	530		Layer	Surface
531	105-110/205	531		Layer	Cobbled surface
532	105-110/215			Fill	Fill of drain [508]
533	105/200-205			Fill	Fill of cut [536]
534	110/215	534		Layer	Industrial waste?
535	110/215	535		Layer	Crushed brick
536	105/200-205	536		Cut	north-south linear
537	100/200 105/200-205	537		Layer	Made ground
538	110-115/215	538		Masonry	Brick & cobble surface
539	110/215	539		Layer	Sandy silt
540	110-115/215	538		Masonry	Brick & cobble surface
541	110-115/215	541		Cut	Construction cut for [542]
542	110-115/215	542		Masonry	Drain
543	105/205			Fill	Fill of cut [554]
544	110/215	544		Cut	Robber trench
545	110/215			Fill	Fill of cut [544]
546	110-115/215 110/210	546		Layer	Sandy silt
547	110-115/215			Fill	Backfill
548	110-115/215			Fill	Fe tie-back
549	110-115/215			Fill	Fe tie-back
550	110-115/215			Fill	Backfill
551	110/215	551		Timber	Anchor for tie-back

Context No	Grid Sq	Plan	Section	Type	Description
552	110-115/215	552		Cut	Construction cut for tie-back
553	110/215	553		Masonry	Maybe part of [508]
554	105/205	554		Cut	Posthole
555	105/215			Fill	Fill of cut [556]
556	105/215	556		Cut	Posthole
557	105/215			Fill	Fill of cut [558]
558	105/215	556		Cut	Posthole
559	105/215			Fill	Fill of cut [560]
560	105/215	556		Cut	Posthole
561	105-110/200 110/205	561		Layer	Mortar spread
562	105/205			Fill	Fill of cut [563]
563	105/205	563		Cut	Pit
564	105/215			Fill	Fill of cut [566]
565	105/215			Fill	Fill of cut [566]
566	105/215	556		Cut	Posthole
567	105/205	567		Layer	Mortar spread
568	110-115/215 110/210	568		Layer	Made ground
569	105-110/205	569		Layer	Brick surface - context sheet missing
570	105/200	570		Cut	Construction cut for [571]
571	105/200	571		Masonry	Drain
572	105/200			Fill	Fill of drain [571]
573	105/210			Fill	Backfill
574	105/210	574		Cut	Construction cut for [490]
575	110/215			Fill	Backfill
576	110/205			Fill	Fill of cut [577]
577	110/205	577		Cut	Posthole
578	110/215			Fill	Fill of cut [579]
579	110/215	579		Cut	Posthole
580	100/210			Fill	Fill of cut [581]
581	100/210	581		Cut	Posthole
582	110-115/215			Fill	Fill of [542]
583	100/200-205	583		Layer	Made ground
584	100-105/200-205	584		Layer	Made ground
585	100-105/200-205	585		Layer	Made ground
586	100-105/200-205	586		Layer	Broken tile & mortar surface
587	100/205 105/200-205	587		Layer	Metalled surface
588	105-110/205	588		Layer	Mortar spread
589	110-115/215			Fill	Fill of [542]
590	110/200			Fill	Fill of cut [591]
591	110/200	591		Cut	Posthole
592					Context sheet missing
593	105/200	593		Masonry	Drain
594	105-110/200	594		Layer	Demolition

Context No	Grid Sq	Plan	Section	Type	Description
595	105-110/200	569		Masonry	Brick surface
596	105/200			Fill	Backfill
597	105/200	597		Cut	Construction cut for [593]
598	100/200			Fill	Fill of cut [599]
599	100/200	599		Cut	Posthole
600	105-110/200			Layer/fill	Bedding for [595]
601	105-110/200	601		Cut	Construction cut for [595]
602	105/200			Fill	Fill of cut [603]
603	105/200	603		Cut	Posthole
604	105/200	604		Layer	Made ground
605	110/205	605		Masonry	Edging
606	110/215			Fill	Fill of cut [607]
607	110/215	579		Cut	Posthole
608	115/215			Fill	Fill of cut [609]
609	115/215	609		Cut	Cut for revetment [81]
610	115/215	610		Layer	Made ground
611	110-115/215	611		Layer	Bedding
612	105/205		33	Fill	Fill of cut [613]
613	105/205	613	33	Cut	Gully
614	105/205		33, 42	Fill	Fill of cut [615]
615	100-110/205		33, 42, 43	Cut	Ditch - mill race?
616	105-110/200	616		Layer	Demolition
617					VOID
618	105/200			Fill	Fill of cut [619]
619	105/200	619		Cut	Posthole
620	105/200			Fill	Fill of cut [621]
621	105/200	621		Cut	Posthole
622	100/200			Fill	Backfill
623	100/200	623		Cut	Posthole
624	100-105/210	293	28	Layer	Sandy silt
625	100-105/210	625, 293	28	Layer	Clayey silt
626	115/215	626		Timber	Shuttering
627	105/205		33, 42, 43	Layer/fill	Silty clay
628	105/200			Fill	Fill of cut [629]
629	105/200	629		Cut	Pit
630	110-115/215	568		Layer	Burnt scorched clay
631	110-115/215	568		Layer	Bedding layer
632	110-115/215			Layer	Crushed brick
633	115/215	633		Cut	Construction cut for [635]
634	115/215			Fill	Fill of drain [635]
635	115/215	635		Masonry	Drain
636	115/215			Fill	Backfill
637	100/205			Fill	Fill of cut [638]
638	100/205	638		Cut	Posthole
639	100/205			Fill	Fill of cut [640]
640	100/205	640		Cut	Posthole
641	105-110/205	641		Layer	Makeup
642	100/205			Fill	Fill of cut [643]
643	100/205	643		Cut	Stakehole

Context No	Grid Sq	Plan	Section	Type	Description
644	105/200-205	644		Layer	Broken tile & mortar surface
645	100/210	645		Masonry	Wall foundation
646	100/205			Fill	Fill of cut [647]
647	100/205	647		Cut	Posthole
648	110/205	648, 641		Timber	Post
649	110/205	649, 641		Timber	Post
650	110/205	650, 641		Timber	Post
651	110/205	651		Timber	Post
652	110/205	652		Timber	Post
653	100/210-215			Fill	Backfill
654	100/210-215	654		Cut	Construction cut for [15]
655	100/200			Fill	Fill of cut [656]
656	100/200	656		Cut	Posthole
657	110/205	657		Timber	Post
658	110/205	658		Timber	Plank
659	110/205	659		Timber	Post
660	115/215	568		Layer	
661	105/205	661		Fill	Degraded wooden post
662	110/220	Survey		Timber	Post
663	110/220	Survey		Timber	Post
664	110/215	Survey		Timber	Post
665	110/215	Survey		Timber	Post
666	110/215	Survey		Timber	Post
667	110/215	Survey		Timber	Post
668	110/210			Fill	Fill of cut [669]
669	110/210	669		Cut	Posthole
670	110/210			Fill	Fill of cut [671]
671	110/210	671		Cut	Posthole
672	100/205			Fill	Backfill
673	100-105/205	673		Cut	Posthole
674	100-105/205			Fill	Fill of cut [675]
675	100-105/205	675		Cut	Post pit
676	110/210			Fill	Fill of cut [678]
677	110/210			Fill	Decayed wood
678	110/210	678		Cut	Posthole
679	100/200	679		Timber	Timber & an fe post
680	110/210			Fill	Fill of barrel [691]
681	110/210			Fill	Fill of barrel [691]
682	110/210			Fill	Fill of cut [683]
683	110/210	683		Cut	Posthole
684	100-105/210-215	684		Cut	Large cut
685	110/210	685		Cut	Linear north-south
686	110/210			Fill	Fill of cut [685]
687	110/210			Fill	Fill of cut [689]
688	110/210			Fill	Fill of cut [689]
689	110/210			Cut	Posthole
690	110/210			Fill	Backfill
691	110/210			Fill	Barrel

Context No	Grid Sq	Plan	Section	Type	Description
692	110/210	692		Cut	Cut for [691]
693	110/210			Fill	Fill of cut [694]
694	110/210			Cut	Posthole
695	110/210			Fill	Fill of cut [696]
696	110/210			Cut	Irregular pit
697	100/205	697		Masonry	Concrete surrounding ceramic drain
698	100/205	698		Cut	Construction cut for [697]
699	100/205			Fill	Ceramic drain
700	100/205			Fill	Fill of cut [701]
701	100/205	701		Cut	Cut for drain - not ex
702	100/205			Fill	Fill of cut [703]
703	100/205			Cut	Rectangular pit
704	105/210-215			Fill	Fill of cut [705]
705	105/210-215	705		Cut	Gully
706	100-105/210			Fill	Fill of cut [707]
707	100-105/210	707		Cut	Gully
708	110/210			Fill	Fill of cut [709]
709	110/210	709		Cut	Stakehole
710	110/210			Fill	Fill of cut [711]
711	110/210	711		Cut	Circular pit
712	110/215			Fill	Fill of cut [716]
713	110/215	713		Cut	Posthole
714	100/205	714		Layer	Dumped deposit
715	110/220	Survey		Timber	Post
716	110/215			Fill	Fill of cut [713]
717	110/220	Survey		Timber	Post
718	110/220	Survey		Timber	Post
719	110/220			Fill	Fill of cut [720]
720	110/220	720		Cut	Posthole
721	100/205			Fill	Fill of cut [722]
722	100/205	722		Cut	Posthole
723	110/220			Fill	Fill of cut [724]
724	110/220	724		Cut	Posthole
725	110/220			Fill	Fill of cut [728]
726	110/220	Survey		Timber	Root
727	110/220	Survey		Timber	Post
728	110/220	728		Cut	Posthole
729	110/220			Fill	Fill of cut [730]
730	110/220	730		Cut	
731	100/210-215		30	Fill	Fill of cut [732]
732	100/210-215	732	30	Cut	
733	100/210-215		30	Fill	Fill of cut [734]
734	100/210-215	734	30	Cut	Construction cut for tie-back [735]/[736]
735	100/210	736		Timber	Tie-back
736	100/210-215	736	30	Timber	Tie-back
737	100/205			Fill	Fill of cut [738]
738	100/205	738		Cut	Pit

Context No	Grid Sq	Plan	Section	Type	Description
739	100/205			Fill	Top fill of cut [673]
740	110/210			Fill	Fill of cut [741]
741	110/210	741		Cut	east-west linear
742	110/210			Fill	Fill of cut [744]
743	110/210	743		Timber	Tie-back
744	110/210	744		Cut	Construction cut for [743]
745	110/210			Fill	Fill of cut [746]
746	110/210	746		Cut	Posthole
747	100/205-210	747		Layer	Gravel - surface?
748	100/205	748		Layer	Broken tile & sandy silt
749	110/220	Survey		Timber	Post
750	110/205	750		Timber	Post
751	105-110/205	751		Masonry	east-west wall
752	115/220		38	Timber	Post
753	105-110/205	753		Masonry	east-west wall
754	100-105/205			Fill	Fill of cut [675]
755	110/210			Fill	Fill of cut [756]
756	110/210	756		Cut	Stakehole
757	110/210			Fill	Fill of cut [758]
758	110/210	758		Cut	Posthole
759					VOID
760	110/210			Fill	Fill of cut [973]
761	110/205	761		Timber	Post
762	110/205	762		Timber	Post
763	110/205-210	763		Layer	Compacted clay
764	110/205		29	Layer	Recorded only in section
765	105/205	765		Timber	Post
766	105/205	766		Timber	Post
767	110/205	767		Timber	Post
768	105/205	768		Timber	Post
769	105/200	788		Timber	Post
770	110/200	788		Timber	Post
771	110/200	787		Timber	Post
772	110/215	Survey		Timber	Post
773	105/205	773		Timber	Post
774	110/210-215	293		Layer	Sandy clay
775	110/205		29	Fill	Fill of cut [776]
776	110/205		29	Cut	
777	110/200	788		Timber	Post
778	110/200	820		Timber	Post
779	100/205			Fill	Fill of cut [780]
780	100/205	780		Cut	Posthole
781	110/205	781		Timber	Post
782	110/205	782		Timber	Post
783	110/205			Fill	Fill of cut [784]
784	110/205	784		Cut	Posthole
785	110/210	785		Timber	Post
786	105-110/210	786		Masonry	east-west wall

Context No	Grid Sq	Plan	Section	Type	Description
787	105-110/200-205	787		Layer	
788	105-110/200 105/205	788		Layer	
789	110-115/205-210	789		Layer	Surface
790	110/210	790		Masonry	east-west wall
791	110/210	791		Masonry	north-south wall
792	105-110/205-210-	792	29, 32	Layer	
793	110/205	793		Timber	Post - context sheet missing
794	105-110/215		34	Layer	Made ground
795	105-110/215		34	Layer	Made ground
796	105/215		34	Layer	Made ground
797	105/215		34	Fill	Fill of cut [798]
798	105/215		34	Cut	
799	105/215		34	Fill	Fill of cut [800]
800	105/215		34	Cut	
801	105-110/215		34	Layer	Alluvium
802	105-110/215		34	Layer	Clayey silt
803	105/215	1	34	Layer	Alluvium
804	105/215	1	34	Fill	Fill of cut [805]
805	105/215	1	34	Cut	
806	105-110/215	1	34, 36, 40	Layer	Alluvium
807	110/210	Survey	36	Timber	Post
808	105/205		33	Layer	Made ground
809	105/205		33	Layer	Made ground
810	105/205		33	Layer/fill	
811	105/205		33	Layer	Demolition
812	105/205		33	Cut	
813	105/205		33	Layer	silty clay
814	105/205		33	Layer	silty clay
815	105/205		33	Layer	silty clay
816	105/205		33	Layer	Silty clay & crushed ceramic building material
817	105-110/200			Fill	Fill of cut [818]
818	110/200	818		Cut	Not ex
819	110/200	820		Fill	Backfill
820	110/200	820		Cut	Posthole - not ex
821					Context sheet missing
822	105-110/215		35, 36	Layer	Alluvium
823	110-115/205-210			Fill	Backfill
824	110-115/205-210	824		Cut	Construction cut for [825] - not ex
825	110-115/205-210	824		Timber	Tie-back anchor
826	110/200	826		Masonry	Cobble
827	105-110/220		38	Layer	Alluvium
828	105-110/220		38	Layer	Clayey sand

Context No	Grid Sq	Plan	Section	Type	Description
829	105/220		38	Layer	Gravel
830	115/215 110-115/220	837	38	Layer	Sandy clay
831	105-110/220		37, 38	Layer	Alluvium
832	110-115/215		36	Layer/fill	Clayey silt
833	110-115/215		36	Layer/fill	Alluvium
834	115/215		36	Layer	Alluvium
835	115/215		36	Layer	Alluvium
836	110-115/215		36	Layer/fill	Gravel & coarse sand
837	105-115/215-220	837	36	Layer	Peaty clay
838	105-110/215		36	Layer	Alluvium
839	110/215		36	Layer/fill	Sandy clay
840	110/215		36	Layer/fill	Silty clay
841	110/215		36	Layer/fill	Fill of channel [844]
842	105-110/215-220	837	36	Layer	Coarse sand
843	110-115/215		36	Cut	Channel
844	110/215		36	Cut	Channel
845	105-110/220		38	Layer/fill	Sandy clay
846	105-110/220		38	Cut	Channel
847	105-110/205			Fill	Fill of cut [848]
848	105-110/205	848		Cut	Robber trench
849	105-110/220		38	Fill	Fill of cut [377]
850	110-115/220		37	Layer/fill	Sandy clay silt
851	110-115/220		37	Layer/fill	Sandy silty clay
852	110-115/220		37	Cut	Channel
853	110-115/220		37	Layer	Alluvium
854	105/220		37	Layer	Alluvium
855	105-110/220		37	Layer	Alluvium
856					VOID
857	110/205			Timber	Post
858	110/205			Fill	Backfill
859	110/205	859		Cut	Posthole
860	110-115/215		36	Layer/fill	Gravelly sand
861	110-115/215		36	Layer/fill	Clay
862	105-115/220		37	Layer	Alluvium
863	105/205			Fill	Fill of cut [864]
864	105/205	864		Cut	Posthole
865	110/205			Fill	Fill of cut [866]
866	110/205		866	Cut	Posthole
867	110/215		36	Fill	Fill of cut [868]
868	110/215		36	Cut	Stakehole
869	110/215		36	Fill	Fill of cut [870]
870	110/215		36	Cut	Stakehole
871	110/215		36	Fill	Fill of cut [872]
872	110/215		36	Cut	Stakehole

Context No	Grid Sq	Plan	Section	Type	Description
873	115/215		36	Fill	Backfill
874	115/215		36	Cut	Construction cut for revetment?
875	105/205			Fill	Fill of cut [876]
876	105/205	876		Cut	Posthole
877	105/205			Fill	Fill of cut [878]
878	105/205	878		Cut	Posthole
879	110/205			Fill	Fill of cut [880]
880	110/205	880		Cut	Robber trench?
881	110/205			Fill	Backfill
882	110/205			Fill	Decayed wood
883	110/205	883		Cut	Posthole
884	115/220	884		Timber	Post
885	115/220	884		Timber	Post
886	115/220	884		Timber	Post
887	115/220	884		Timber	Post
888	115/220	884		Timber	Post
889	115/220	884		Timber	Post
890	115/220	884		Timber	Post
891	115/220	884		Timber	Post
892	115/220	884		Timber	Post
893	115/220	884		Timber	Post
894	115/220	884		Timber	Post
895	115/220	884		Timber	Post
896	110/215		40	Fill	Fill of cut [897]
897	110/215		40	Cut	
898	115/215		40	Fill	Fill of cut [899]
899	115/215		40	Cut	Channel
900	110-115/215		40	Fill	Fill of cut [904]
901	110/215		40	Fill	Fill of cut [904]
902	110/215		40	Fill	Fill of cut [904]
903	110-115/215		40	Fill	Fill of cut [904]
904	110-115/215		40	Cut	Channel
905	110-115/215		40	Fill	Fill of cut [907]
906	110-115/215		40	Fill	Fill of cut [907]
907	110-115/215		40	Cut	Channel
908	105-110/220		39	Fill	Fill of cut [911]
909	105-110/220		39	Fill	Fill of cut [911]
910	105-110/220		39	Fill	Fill of cut [911]
911	105-110/220		39	Cut	Poss channel
912	105-110/220		39	Layer	Alluvium
913	105-110/220		39	Layer	Alluvium
914	105-110/220		39	Layer	Alluvium
915	110/220		39	Layer	Alluvium
916	110-115/220		39	Layer/fill	Alluvium
917	110/205			Fill	Fill of cut [918]
918	110/205	918		Cut	Posthole
919	100/205			Fill	Fill of cut [920]
920	100/205	920		Cut	Posthole

Context No	Grid Sq	Plan	Section	Type	Description
921	110/210	791		Layer	Compacted clay
922	110-115/220		39	Layer	Alluvium
923	110/210	923		Cut	Posthole
924	110/210			Fill	Fill of cut [923]
925	110/210			Fill	Fill of cut [926]
926	110/210	926		Cut	Posthole
927	110/210	927		Cut	
928	110/210			Fill	Fill of cut [927]
929	105/205		42, 43	Fill	Fill of cut [985]
930	105/205		42, 43	Fill	Fill of cut [615]
931	110/205	931		Cut	Posthole
932	110/205			Fill	Fill of cut [931]
933	110/205	933		Cut	Posthole
934	110/205			Fill	Fill of cut [933]
935	110/205	935		Cut	Posthole
936	110/205			Fill	Fill of cut [935]
937	110/205			Fill	Fill of cut [938]
938	110/205	938		Cut	Posthole
939	105/220			Layer	Silty sand - recorded only on a sketch section
940	105/220			Layer	Natural gravel - recorded only on a sketch section
941	105/205			Fill	Fill of cut [943]
942	105/205			Fill	Fill of cut [943]
943	105/205			Cut	Rectangular pit
944	100/205			Fill	Fill of cut [945]
945	100/205	945		Cut	Posthole
946	100/205			Fill	Fill of cut [947]
947	100/205	947		Cut	Pit
948	100/205			Fill	Fill of cut [949]
949	100/205	949		Cut	Pit
950	105/205		42, 43	Fill	Fill of cut [615]
951	3	951		Cut	Construction cut for [790]
952	105/205		42	Fill	Fill of cut [615]
953	105/205-210			Fill	Fill of cut [954]
954	105/205-210	954		Cut	Construction cut for wall [442]
955	110/205			Fill	Fill of cut [956]
956	110/205	956		Cut	
957	110/205			Fill	Top fill of cut [615]
958	110/210	958		Cut	Construction cut for [791]
959	120/215-220	959	41	Layer	Clayey sand
960	100/205			Fill	Fill of cut [961]
961	100/205	961		Cut	Pit
962	110/205-210			Masonry	Fill of cut [963]
963	110/205-210	963		Cut	Construction cut for [962]
964	100/205			Fill	Fill of cut [965]
965	100/205	965		Cut	Pit
966	105-110/200-205	966	42	Layer/fill	Top fill of cut [615]

Context No	Grid Sq	Plan	Section	Type	Description
967	105/205		42	Fill	
968	105/205		42	Fill	Fill of cut [615]
969	110/205			Fill	Fill of cut [970]
970	110/205	970		Cut	Rectangular pit
971	100-105/205			Fill	Fill of cut 972
972	100-105/205	972		Cut	
973	110/210	973		Cut	Pit
974	110/200-205	293		Layer	
975	110/205	293		Fill	Fill of cut [976]
976	110/205	293		Cut	Not ex
977	110/200-205	293		Fill	Un ex fill of tie-back
978	100-105/200-205	293		Fill	Fill of cut [979]
979	100-105/200-205	293		Cut	Not ex
980	110/205			Timber	Timber lining for cut [970]
981	100-105/210	997, 293	49	Fill	Backfill
982	100/205	982		Cut	
983	100/205			Fill	Fill of cut [982]
984	110/210	293		Layer	
985	105/205		42, 43	Cut	Channel - mill race?
986	105/205			Fill	Fill of cut [987]
987	105/205	293		Cut	Not ex
988					Missing context sheet
989	110/205	Survey		Timber	Post
990	110/205	Survey		Timber	Post
991	100-105/210	Survey, 991	49	Masonry	east-west wall
992	100-105/210		49	Fill	Backfill
993	100-105/210		49	Cut	Construction cut for wall [991]
994	105/205	1027, 1070	42, 43	Timber	
995	105/205	1027, 1070		Timber	
996	110/210	Survey		Timber	Post
997	100-105/210	997, 293	49	Cut	Robber trench
998	110/210	Survey		Timber	Post
999	110/210	Survey		Timber	Post
1000	110/210	Survey		Timber	Post
1001	110/210	Survey		Timber	
1002	110/210	Survey		Timber	Post
1003	110/215	Survey		Timber	Post
1004	105-110/210		44, 49, 50	Layer	Alluvium
1005	105-110/210		44, 45, 49, 50	Layer	Alluvium
1006	100-105/205		44, 45	Layer	Alluvium
1007	100-110/205		44, 45, 48	Layer	Peaty clay
1008	105-110/205-210	1011	44, 45, 48	Layer	Peaty sand

Context No	Grid Sq	Plan	Section	Type	Description
1009	105/205		44	Fill	Fill of cut [1011]
1010	105/205-210	1011	44, 50	Fill	Fill of cut [1011]
1011	105/205-210	1011	44, 50	Cut	Channel - not bottomed
1012	105/210		44, 50	Layer	Alluvium
1013	105/210	1011	44, 50	Layer	Alluvium
1014	110/210	Survey		Timber	Post
1015	115/200		46	Layer	Made ground
1016	115/200		46	Layer	Made ground
1017	115/200		46	Fill	Fill of cut [1018]
1018	115/200		46	Cut	Posthole
1019	115/200		46	Layer	Made ground
1020	115/200		46	Layer	Made ground
1021	115/200		46	Fill	Fill of cut [1022]
1022	115/200		46	Cut	Posthole
1023	115/200		46	Timber	Stake
1024	115/200		46	Layer	Made ground
1025	115/200		46, 47	Layer	Clay silt
1026	115/200		46	Layer	Dumped deposit
1027	100-110/205		45	Layer/fill	Made ground
1028	105-110/205		45	Fill	Fill of cut [1093]
1029	110/205		48	Timber	Horizontal setting within [1027] not shown on matrix
1030			45	Timber	
1031			45	Timber	
1032	100-105/205		47	Fill	Fill of cut [1033]
1033	100-105/205		47	Cut	
1034	100/205		47	Fill	Fill of cut [1035]
1035	100/205		47	Cut	
1036	100/205		47	Fill	Fill of cut [1037]
1037	100/205		47	Cut	
1038	100/205		47	Timber	Horizontal
1039	100/205		47	Timber	Vertical
1040	105/205		47	Layer/fill	
1041	100/205		47	Layer/fill	
1042	105/205		47	Layer/fill	
1043	110/205		47	Fill	Fill of cut [1044]
1044	110/205		47	Cut	
1045	115/200		46, 47	Layer	Alluvium
1046	100/205		49	Fill	Fill of cut [1048]
1047	100/205		49	Fill	Fill of cut [1048]
1048	100/205		49	Cut	
1049	110/210	Survey		Timber	Post
1050	100/205		49	Fill	Fill of cut [1052]
1051	100/205		49	Fill	Fill of cut [1052]
1052	100/205		49	Cut	
1053	100/205		49	Layer/fill	Silty clay
1054	110/200		51	Layer	
1055	110/200		51	Layer	

Context No	Grid Sq	Plan	Section	Type	Description
1056	110/200-205		51	Layer	
1057	105/210		50	Layer/fill	
1058	105-110/210		50	Layer	Alluvium
1059	105-110/210		50	Layer	Alluvium
1060	100/210		49	Layer	Alluvium
1061	105/210	1011	50	Layer	Alluvium
1062	110/210	1011	50	Layer	Alluvium
1063	100/210		49	Fill	Backfill
1064	100/210			Timber	Left in situ
1065					VOID
1066	105/205	1070		Timber	Vertical
1067	105/205	1070		Timber	
1068	105/205	1070		Timber	Vertical
1069	110/205	1027, 1070		Timber	Vertical
1070	105-110/205	1070		Timber	Horizontal
1071	110/205	1070		Timber	Vertical
1072	110/205	1070		Timber	Horizontal
1073	110/205	1070		Timber	Horizontal
1074	110/205	1070		Timber	Horizontal - on edge
1075	110/205	1070		Timber	Vertical
1076	110/205	1070		Timber	Vertical
1077	110/205	1070		Timber	Vertical
1078				Timber	
1079	110/205	1070		Timber	Vertical
1080	110/205	1070		Timber	Horizontal
1081	110/205	1070		Timber	Vertical
1082	110/205	1070		Timber	Vertical
1083	105/205	1070		Timber	
1084				Timber	
1085				Timber	
1086	105/205			Timber	
1087	105/205	1070		Timber	
1088				Timber	
1089					VOID
1090	110/205	Sketch		Fill	Backfill
1091	110/205	Sketch		Cut	
1092	110/205	1027		Timber	Left in situ
1093	105-110/205		45	Cut	

13 Appendix 2: pottery

Distribution of pottery types showing individual contexts containing pottery, indicating period and context, the number of sherds, date range of the pottery and a suggested deposition date.

Context	Period	Sherd count	Date range of the pottery types	Latest dated pottery type	Pottery types	Spot date
14	6	20	1550-1900	1830-1900	ENGS, ENPO HP, FREC, PMR, REFW, REFW SPON1, TPW, TPW3, YELL	1840-1900+
26	6	14	1770-1900	1825-1900	ENPO HP, PEAR BW, REFW, SUND, TPW, TPW3, TPW4, YELL SLIP	1825-1900+
43	6	39	1680-1900	1830-1900	ENGS ,ENGS BRST, ENPO HP, ENPO UTR, PEAR BW, REFW, REFW CHROM, SUND, SUND MOT, TGW H, TPW, TPW3, TPW4, YELL	1830-1870
45	6	45	1580-1900	1830-1900	CHPO BATV, ENGS BRST, ENPO, ENPO HP, ENPO UTR, PMR REFW, REFW CHROM, TPW, TPW3, TPW4	1830-1900
55	6	1	1805-1900	1805-1900	REFW	1907+
79	6	27	1700-1900	1850-1900	DERBS, ENGS, ENGS BRST, ENPO HP, ENPO LITH, ENPO PNTD, REFW, REFW CHROM, TPW	1928+
90	6	3	1780-1900	1780-1900	ENPO HP, RPOT BB2, TPW	1780-1900
94	6	72	1700-1900	1850-1900	BLUE, ENGS, ENGS BRST, ENPO HP, ENPO PNTD, MAJO, PIPE CLAY, PMR SLIP, REFR, REFW, REFW CHROM, REFW SPON1, TPW, TPW LITH, TPW3, TPW4	1884+
99	6	2	1780-1900	1780-1900	TPW, XX	1780-1900
105	6	61	1660-1900	1850-1900	ENGS, ENGS BRST, ENPO HP, ENPO LITH, ENPO OTR, ENPO PNTD, ENPO UTR, JAPO, LUST, REFR, REFW, REFW CHROM, TPW, TPW3, TPW4, TPW6	1916+
114	6	1	1805-1900	1805-1900	REFW	1800+
129	6	29	1740-1900	1830-1900	CREA DEV, ENPO HP, PEAR BW, PEAR TR, REFW, REFW CHROM, REFW SLIP, SWSG SCRB, TPW	1830-1900
138	6	1	1770-1840	1770-1840	PEAR TR	1770-1840
140	6	1	1830-1900	1830-1900	ENGS BRST	1830-1940
141	6	9	1755-1900	1830-1900	ENPO OTR, REFW, REFW CHROM, XX, YELL	1820-1900+
146	6	1	1670-1926	1670-1926	LONS	1670-1930
153	6	1	1810-1900	1810-1900	TPW3	1810-1900
179	6	53	1580-1926	1830-1926	CREA DEV, DERBS, ENPO HP, LONS, PEAR BW,, PEAR TR,, PMR,, REFW, REFW SPON1, ROCK, TGW BLUE, TPW, TPW4, YELL	1830-1900
180	6	1	1780-1900	1780-1900	TPW	1780-1900
181	6	4	1670-1926	1820-1926	LONS, YELL	1820-1900
193	6	3	1580-1870	1740-1870	PMFRG, STSL, SWSG SCRB	1740-1780
198	5	9	1630-1846	1720-1846	SWSG, TGW BLUE, TGW H	1720-1780
202	6	11	1550-1926	1850-1926	BORDY, CHPO IMARI, CONP, ENGS, ENGS BRST, LONS, MAJO, TPW	1850-1900+
206	6	23	1580-1926	1820-1926	, BORDG?, CHPO BW, CREA DEV, LONS, PEAR ERTH, PEAR TR, PMR, REFW, SUND, TPW, TPW3, YELL	1830--1900

Context	Period	Sherd count	Date range of the pottery types	Latest dated pottery type	Pottery types	Spot date
215	6	24	1580-1900	1830-1900	CREA DEV, DERBS, ENGS, ENPO HP, PEAR, PEAR TR, PMR, REFW, REFW CHROM, REFW SPON1, TPW, TPW3, YELL	1840-1900
216	5	1	1780-1900	1780-1900	TPW	1780-1900
220	5	1	1680-1800	1680-1800	TGW H	1750-1775
228	5	1	1580-1900	1580-1900	PMR	1580-1900
238	5	31	1580-1900	1850-1900	CHPO, CHPO BW, ENGS BRST, ENPO HP, MAJO, PEAR, PEAR BW, PEAR ERTH, PEAR SLIP, PEAR TR, PMR, REFW, ROCK, STSL, TPW, TPW4, YELL, YELL SLIP	1850-1900
240	6	1	1800-1900	1800-1900	ROCK	1850-1900
243	5	5	1710-1900	1830-1900	CONP, ENGS BRST, ENPO PNTD, REFW CHROM, TPW	1910+
253	6	10	1580-1926	1810-1926	ENGS, LONS, PMR, TPW, TPW3	1850-1900
254	5	4	1680-1900	1780-1900	CREA DEV, PEAR TR, TGW H, TPW	1770-1830
257	6	1	1550-1700	1550-1700	BORDG	1550-1750
259	6	3	1720-1840	1775-1840	PEAR SLIP, PEAR TR, SWSG	1780-1850
262	6	7	1590-1900	1830-1900	ENPO HP,PEAR TR, REFW CHROM, TPW, WEST	1800-1900
264	5	1	1780-1900	1780-1900	TPW	1780-1900
265	6	18	1590-1900	1830-1900	CHPO BW, ENGS, ENPO HP, PEAR BW, REFW, REFW CHROM, SUND, TPW, TPW3	1810-1900
269	2	1	1000-1225	1000-1225	EMSSX	1000-1225
276	6	10	1580-1900	1830-1900	DERBS, ENGS BRST, PMR, REFW CHROM, ROCK, TPW, TPW3	1850-1900
279	3	1	1630-1700	1630-1700	METS	1630-1700
294	4	4	1580-1900	1760-1900	CHPO, CREA DEV	1760-1830
296	4	5	1590-1900	1760-1900	CHPO BW, CHPO IMARI, CREA DEV, ENPO, TGW H	1760-1830
298	5	7	1580-1926	1770-1926	CREA DEV, LONS, PEAR TR, PMR	1770-1830
303	5	1	1805-1900	1805-1900	REFW	1800+
311	5	8	1700-1900	1770-1900	BBAS, ENGS, PEAR TR	1810-1840
331	3	3	1630-1846	1630-1846	TGW C	1630-1846
333	3	28	1580-1900	1630-1900	PMFRG, PMR, TGW C, TGW D	1630-1680
336	5	1	1700-1900	1700-1900	ENGS	1850-1900
338	5	1	1580-1900	1580-1900	PMR	1580-1900
341	5	2	1720-1830	1760-1830	CREA DEV, SWSG	1760-1780
342	3	1	1630-1846	1630-1846	TGW C	1630-1680
344	5	2	1825-1900	1825-1900	TPW4	1825-1900
356	5	3	1630-1846	1680-1846	TGW BLUE, TGW H	1825-1900
371	5	3	1760-1830	1760-1830	CREA DEV	1760-1830
374	4	3	1570-1846	1720-1780	SWSG, TGW, TGW H	1720-1780
376	5	21	1580-1900	1830-1900	BBAS, CREA DEV, PEAR SLIP, PEAR TR, PEAR TR3, PMR, REFW CHROM, SUND, TPW	1830-1850
392	3	3	1580-1900	1580-1900	PMFRG, PMR	1580-1700
398	5	11	1580-1900	1770-1900	CREA DEV,, PEAR TR, PMFR, PMR	1770-1830
435	5	12	1580-1900	1810-1900	BBAS, CREA SLIP, ENGS, PMR, TPW, TPW3, XX	1830-1900
437	5	1	1770-1840	1770-1840	PEAR TR	1770-1840
452	5	16	1805-1900	1810-1900	REFW, TPW3	1850-1900+
483	5	3	1830-1900	1830-1900	REFW CHROM	1850-1900+
505	6	7	1550-1900	1805-1900	BORDG, BORDO, BORDY, RBOR, REFW, TGW, TGW D	1630-1680
514	5	2	1710-1900	1830-1900	CONP, REFW SPON1	1840-1900
516	3	1	1700-1900	1700-1900	ENGS	1700-1900

Context	Period	Sherd count	Date range of the pottery types	Latest dated pottery type	Pottery types	Spot date
521	5	3	1760-1900	1805-1900	CREA DEV, PEAR TR, REFW	1800--1900
530	5	4	1700-1900	1780-1900	ENGS, SWSG, TPW	-1800-1900
531	5	29	1240-1900	1830-1900	CHPO BW, CREA DEV, KING, PEAR BW, PEAR ERTH, PMR, RBOR, REFW, REFW CHROM, REFW SPON, SWSG, TGW H, TPW, TPW3, TPW4, YELL, YELL SLIP	1830-1900
532	6	6	1770-1900	1830-1900	BBASG, ENGS BRST, PEAR BW, REFW	1830-1900
533	5	27	1580-1926	1805-1926	CHPO, CHPO IMARI, CREA DEV, ENPO PNTD, LONS, PEAR BW, PEAR TR, REFW, SWSG, TGW H	1800-1830
538	5	1	1810-1900	1810-1900	TPW3	1800-1830
539	5	2	1760-1880	1770-1880	BBASG, CREA DEV	1770-1830
543	5	1	1760-1830	1760-1830	CREA DEV	1760-1830
545	6	16	1680-1900	1805-1900	BBASG, CONP, CREA DEV, ENPO UTR, REFW, TGW H, TPW	1800-1900
546	6	11	1710-1900	1840-1900	CONP, REFW, SUND, TPW, TPW3, TPW4, TPW6	1840-1900
550	6	4	1720-1900	1780-1900	ENPO HP, PEAR TR, SWSG	1800-1900
561	6	32	1670-1926	1830-1926	CREA DEV, ENPO HP, LONS, REFW, REFW CHROM, REFW LUST, ROCK, SUND, TPW, TPW FLOW, YELL	1830-1900
562	4	5	1580-1900	1770-1900	CREA DEV, PEAR TR, PMR, SWSG	1770-1830
564	3	1	1550-1700	1550-1700	FREC	1550-1700
569	5	2	1670-1926	1670-1926	LONS	1825-1900
575	6	24	1700-1900	1830-1900	BBASG, CREA DEV, ENGS, ENGS BRST, ENPO UTR, PEAR, REFW, TPW, TPW3, TPW4, YELL SLIP	1830-1900
576	5	4	1580-1900	1780-1900	PMR, TPW	1780-1900
578	5	6	1760-1900	1805-1900	CREA DEV, PEAR BW, REFW, TPW	1800-1820
583	6	7	1700-1900	1820-1900	ENGS, REFW, TPW, YELL	1820-1900
584	6	58	1580-1900	1830-1900	CHPO BW, CREA DEV, ENGS, ENPO, NOTS, PEAR, PEAR BW, PMR, REFW, REFW CHROM, REFW SLIP, TPW, TPW4, YELL	1850-1900
596	5	12	1580-1900	1825-1900	PEAR TR, PMR, REFW SLIP, SWSG COB, TPW, TPW4	1825-1900
600	6	4	1745-1900	1810-1900	ENPO, REFW, TPW, TPW3	1850-1900
602	6	4	1580-1926	1805-1926	LONS, PMR, REFW, TPW	1780--1900
604	5	8	1580-1900	1830-1900	CREA DEV, ENPO HP, PMR, REFW, REFW CHROM, TPW3	1825-1900
606	5	8	1580-1900	1830-1900	PMR, REFW CHROM, SWSG, TPW	1840-1870
608	6	4	1780-1900	1810-1900	REFW, TPW, TPW3	1850-1900
610	5	1	1700-1900	1700-1900	ENGS	1800-1900
611	5	4	1590-1900	1805-1900	CHPO BW, REFW, TPW	1780-1900
614	3	19	1570-1926	1690-1926	LONS, PMBL, PMFR, PMR, STBRS, TGW A, TGW C, TGW E, TGW H	1690-1700
618	5	2	1780-1900	1805-1900	REFW SLIP, TPW	1800-1850
622	6	12	1580-1900	1830-1900	ENGS, ENGS BRST, ENPO HP, PMR, REFW, TPW, XX	1830-1900
624	3	3	1580-1900	1820-1900	PMR, YELL	1830-1900
627	3	19	1480-1900	1690-1900	PMBL, PMR, PMRE, STBRS, TGW, TGW C	1690-1730
628	5	6	1550-1900	1550-1900	RBOR	1550-1900
631	5	2	1580-1900	1770-1900	BBAS, PMR	1770-1900
634	3	1	1580-1700	1580-1700	PMFR	1680-1700
641	5	181	1350-1926	1830-1926	BBAS, CHEA, CHPO, CREA DEV, CREA MARB, DERBS, ENGS, ENGS BRST, ENPO HP, LONS, NOTS, PEAR BW, PEAR ERTH, PMR, RBOR, REFW,	1830-1850

Context	Period	Sherd count	Date range of the pottery types	Latest dated pottery type	Pottery types	Spot date
					REFW SLIP, RESTG, SPEC, STSL, SWSG, TGW, TGW C, TGW H, TPW, TPW4, XX SLIP, YELL, YELL SLIP	
646	5	2	1770-1900	1780-1900	PEAR, TPW	1770-1840
672	5	1	1580-1900	1580-1900	PMR	1810-1830
675	5	13	1550-1900	1810-1900	BORDO, CREA DEV, NOTS, PEAR BW, PEAR TR3, PMR, TGW BLUE	1810-1830
680	6	3	1780-1900	1830-1900	ENGS BRST, TPW, YELL SLIP	1830-1900
686	3	1	1550-1900	1550-1900	RBOR	1550-1900
687	4	2	1720-1830	1760-1830	CREA GRN, SWSG	1760-1780
702	5	4	1700-1900	1830-1900	ENGS, REFW CHROM, TPW3, YELL SLIP	1810-1900
708	3	1	1680-1800	1680-1800	TGW H	1680--1800
710	3	4	1830-1900	1830-1900	ENGS BRST	1680-1800
714	5	6	1680-1900	1775-1900	CHPO IMARI, CREA DEV, PEAR SLIP	1775-1830
721	4	1	1760-1830	1760-1830	CREA DEV	1760-1830
737	5	2	1770-1840	1770-1840	PEAR, PEAR TR	1770-1840
739	5	6	1760-1900	1780-1900	CREA DEV, PEAR, PEAR TR, TPW	1780-1840
740	3	1	1680-1900	1680-1900	CHPO IMARI	1680-1900
742	6	2	1580-1900	1680-1900	PMR, SPEC	1680-1740
757	4	1	1720-1780	1720-1780	SWSG	1720-1780
779	5	6	1780-1900	1825-1900	ENPO HP, REFW, TPW, TPW4	1825-1900
798	5	1	1580-1900	1580-1900	PMR	1580-1900
806	2	1	1550-1700	1550-1700	BORDY	1550-1700
841	2	1	1580-1900	1580-1900	PMR	1780-1900
853	2	1	1000-1225	1000-1225	EMSHX	1000-1225
858	5	18	1570-1900	1820-1900	CHPO BW, CHPO IMARI, CREA DEV, ENPO HP, PEAR BW, PEAR TR, PMR, REFW, REFW SLIP, SPEC, STSL, TGW, YELL SLIP	1820-1900
879	5	3	1550-1900	1780-1900	RBOR, RBORG?, TPW	1780-1900
881	5	1	1780-1900	1780-1900	TPW	1780-1900
910	2	1	1200-1550	1200-1550	SOWX	1200-1500
929	3	2	1580-1926	1670-1926	LONS, PMR	1670-1900
930	3	12	1480-1900	1660-1900	BORDO, PMBL, PMFRG, PMR, PMSL, RBOR, STSL, TGW C	1660-1700
937	3	1	1590-1900	1590-1900	CHPO BW	1650-1900
941	5	16	1580-1900	1820-1900	CHPO BW, CREA DEV, ENPO, PEAR BW, PMR, TGW H, TPW, YELL SLIP	1820--1900
944	5	23	1550-1900	1770-1900	CHPO BW, CHPO IMARI, CREA DEV, CREA OTR, PEAR BW, PMR, RBOR, STSL, SWSG, SWSG SCRB, TGW BLUE, XX	1770-1780
950	3	5	1000-1900	1630-1900	EMSX, PMFRG,, PMR,, PMSRG,, TGW C	1630-1650
955	4	2	1550-1700	1580-1700	BORDG, PMFRG	1570-1700
957	4	2	1550-1846	1630-1846	BORDY, TGW BLUE	1700-1800
964	5	13	1240-1900	1820-1900	KING, SWSG, TGW BLUE, TGW H, WEST CHP2, YELL, YELL SLIP	1820-1900
971	4	11	1580-1900	1740-1900	PMR, SWSG, SWSG SCRB	1740-1780
1020	3	2	1550-1700	1612-1700	BORDG, TGW A	1630-1650
1090	3	1	1175-1400	1175-1400	RCWX	1175-1400

14 Appendix 3: clay tobacco pipe

Context	Period	Fragment count	Date range of clay tobacco pipe types	Latest dated clay tobacco pipe type	Clay tobacco pipe types (and maker)	Spot date
[26]	6	6	1820-1860	1820-1860	X1 AO28 (* *)	1820-1860
[43]	6	10	1850-1910	1850-1910	X1 AO33	1840-1910
[79]	6	7	1840-1910	1850-1910	X1 AO29 (I ?), X2 AO30	1850-1880
[94]	6	6	1820-1910	1850-1910	X1 AO28, X1 AO29 (G B), X3 AO30	1850-1880
[105]	3	1	1820-1860	1820-1860	X1 AO28	1820-1860
[105/210]		1	1660-1680	1660-1680	X1 AO13	1660-1680
[107/206]		2			Stems	17th/18th C.
[129]	6	20			Stems	1580-1910
[179]	6	9			Stems	1580-1910
[180]	6	1			Stem	1680-1710
[181]	6	4			Stems	1580-1910
[193]	6	8			X1 HEEL (I C)	19th C.
[196]	6	2			Stems	1580-1910
[197]	5	36	1680-1780	1730-1780	X1 AO22, X2 OS10 (X1 W M), X8 OS12 (X 1 ?, X1 . ., X3 R B)	1730-1780
[198]	5	19	1700-1860	1820-1860	X1 OS10,X1 OS12 (?W H0, X1 AO29 (? ?F)	1820-1860
[215]	6	4	1700-1910	1850-1910	X1 OS10, x1 AO29 (m l) x1 AO30 and stem with the name 'Cornwell'	1850-1910
[216]	5	3			Stems	19th C.
[220]	5	1			Stem	1580-1910
[222]	5	1			Stem	1580-1910
[224]	5	1			Stem	1580-1910
[226]	5	1			Stem	1580-1910
[228]	5	7			Heel with initials W M	1700-1740
[238]	6	19	1780-1860	1820-1860	X1 AO27 (I F), X1 AO28 (? I)	1820-1830
[239]	4	5			?AO25	18th C.?
[253]	6	3			Stems	1580-1910
[254]	5	5			Stems	1580-1910
[265]	6	4			Stems	1580-1910
[276]	6	1			Stem	1580-1910
[279]	3	1	1680-1710	1680-1710	X1 AO20	1680-1710
[294]	4	2			Stems	1580-1910
[296]	4	2			Stems	1580-1910
[298]	5	7			Stems	1580-1910
[331]	3	4			Stems	1660-1710
[333]	3	161	1680-1740	1700-1740	X1 AO22, X26 OS10 (X1 D ?I)	1700-1710
[336]	5	3			Stems	1580-1910
[342]	3	5			Stems	1580-1910
[356]	5	2			Stems	18th C.?
[371]	5	6	1730-1800	1730-1800	X1 AO26 (? K)	1730-1800
[374]	4	1	1700-1740	1700-1740	X1 OS10 (R B)	1730-1780
[376]	5	3	1820-1910	1850-1910	X1 OS10 (R B), X1 AO28 (I F), X1 AO29 (K G stamp)	1850-1860
[392]	3	2			Stems	1580-1910
[435]	5	8	1850-1910	1850-1910	X1 AO22	1840-1910
[437]	5	1	1820-1860	1820-1860	X1 AO28 (* *)	1820-1860
[442]	3	1			Stem	1580-1910
[474]	4	3	1660-1680	1660-1680	X1 AO18	1660-1680

Context	Period	Fragment count	Date range of clay tobacco pipe types	Latest dated clay tobacco pipe type	Clay tobacco pipe types (and maker)	Spot date
[505]	6	22	1660-1710	1680-1710	X1 AO13, X2 AO15, X1 AO18, X1 AO22	1680-1710
[514]	6	2			Stems	1580-1910
[531]	5	10			Stems	1580-1910
[532]	6	2			Stems	1580-1910
[533]	5	14	1780-1830	1780-1830	X1 AO27 (I ?S),	1780-1830
[545]	6	13	1780-1830	1780-1830	X2 AO27 (I S)	19th century
[550]	6	3	1820-1860	1820-1860	X1 AO28	1820-1860
[561]	6	2	1820-1860	1820-1860		1820-1860
[562]	4	8	1680-1710	1680-1710	X1 ?AO22	1680-1710
[575]	6	10	1820-1910	1850-1910	X1 AO28 (* *), X1 AO30, X1 bowl fragment with shield stamp with 'BALM[E] MIL[E] END'	1850-1860
[583]	6	1			Stem	1580-1910
[584]	6	2	1820-1860	1820-1860	X1 AO28 (?R S)	1820-1860
[596]	5	2			Stems	1580-1910
[602]	6	3	1820-1860	1820-1860	X1 AO28 (? G)	1820-1860
[604]	5	1			Stem	1580-1910
[606]	5	1	1840-1880	1840-1880	X1 AO29 (G B)	1840-1880
[614]	3	77	1640-1910	1850-1910	X1 AO9, X9 OS10 (X4 WM), X1 AO30	?1840+
[618]	5	2			Stems	1580-1910
[622]	6	1			Stem	1580-1910
[624]	3	2	1660-1680	1660-1680	X1 AO15	1660-1680
[627]	3	89	1680-1770	1700-1770	X1 AO21 variant, X3 AO22 (X1 W M), X1 AO24, X5 OS 10 (X1 E C, X2 W M)	1700-1740
[631]	5	2			19th century bowl fragment	19th C.
[641]	5	93	1700-1880	1840-1880	X2 AO25 (X1 P B), X1 AO29 (. .)	1840-1890
[646]	5	2			Stems	1580-1910
[653]	5	3	1680-1710	1680-1710	X1 AO21	1680-1710
[672]	5	1			Stem	1580-1710
[675]	5	11			Stems	17th-18th C.
[676]	3	1			Stem	1580-1910
[686]	3	1			Stem	1580-1910
[695]	3	1			Stem	1580-1910
[695]	3	2	1680-1710	1680-1710	X1 AO22	1680-1710
[702]	5	6			Stems	1580-1910
[714]	5	11	1780-1830	1780-1830	X1 AO27 (J D)	1780-1830
[721]	4	2			Stems	1580-1910
[737]	5	1			Stem	1580-1910
[739]	5	2	1780-1830	1780-1830	X1 AO27 (J B)	1780-1830
[740]	3	1			Stem	1580-1910
[763]	3	3			Stems	1580-1910
[810]	3	2			Stems	17th/18th C.
[847]	5	7	1780-1830	1780-1830	X1 AO27 (P B : fox and grapes)	1780-1830
[866]	5	2			Stems	1580-1910
[919]	5	1			Stem	1580-1910
[925]	3	1			Stem	1580-1910
[929]	3	20	1700-1740	1700-1740	X1 OS10	1700-1740
[930]	3	29	1680-1740	1700-1740	X1 AO21, X2 OS10 (X1 W M)	1700-1740
[941]	5	5	1680-1860	1820-1860	X1 AO20/22,X1 AO28	1820-1860
[944]	5	8			Stems	1580-1910
[950]	3	12			Stems	1580-1910
[955]	4	11	1700-1770	1700-1770	X1 AO25	1700-1770
[957]	4	4	1680-1740	1700-1740	X1 AO21 (E ?), X1 OS10	1700-1710

Context	Period	Fragment count	Date range of clay tobacco pipe types	Latest dated clay tobacco pipe type	Clay tobacco pipe types (and maker)	Spot date
[960]	3	1			Stem	1580-1910
[964]	5	7	1700-1740	1700-1740	X1 OS10 (I W)	1700-1740
[969]	3	4	1700-1740	1700-1740	X1 OS10	1700-1740
[971]	4	7	1700-1770	1700-1770	X1 AO25	1700-1770
[1020]	3	1	1680-1710	1680-1710	X1 AO22	1680-1710

15 Appendix 4: ceramic building material

Context	Fabric	Layer	Form	Size	Date range of material		Latest dated material	
15	*3032; 3033; 3034*	N/S External wall	Reused stock moulded fresh Machine bricks	7	1450	1950	1850	1950
18	*3032; 3032nr 3033 ; 3033*	E/W Internal wall	Reused stock moulded fresh machine brick	3	1450	1950	1850	1950
19	*3032; 3032nr3033*	E/W Internal wall	Fresh and reused stock brick gravel cement	1	1664	1900	1850	1900
27	*3032; 3032nr3033; 3047*	E/W Internal wall	Fresh 19th and reused stock brick	3	1664	1725	1690	1900
28	*3032; 3033*	E/W Internal wall	Reused stock brick in 19th century gravel cement	4	1450	1900	1800	1900
29	*3032nr3033; 3033; 3034*	E/W Internal wall	Reused stock brick IN 19th century gravel cement	4	1450	1900	1800	1900
30	*3032; 3032nr3033;3033*	E/W Internal wall	Reused stock brick in 19th century gravel and Roman cement	3	1450	1900	1800	1900
31	*3032; 3033*	E/W Internal wall	Reused stock brick gravel cement and fresh machined brick	3	1450	1900	1850	1900
43	*3032; 3117*	Back timber revetment	Brick and slate machined roofing tile	6	1666	1900	1666	1900
60	*3034*	Made Ground	Stock moulded brick no reuse Roman cement	1	1664	1900	1790	1900
63	*3032; 3032nr3033*	Masonry	Stock moulded brick 18th cent cement	3	1666	1850	1666	1850
64	*3035*	Masonry	Machined London stock brick	1	1850	1940	1850	1940
83	*2276; 3032*	E/W Internal wall	Peg tile and stock moulded brick 18th century cement	7	1480	1900	1480	1900
84	*3032; 3032mr3033; 2276*	E/W Internal wall	Reused peg tile attached to stock moulded brick	8	1480	1900	1480	1900
85	*3032*	Concrete and brick threshold	Stock moulded brick	2	1666	1850	1666	1850
86	*3033; 3035*	E/W Internal wall	Machine frogged red and stock brick	2	1850	1900	1850	1900
90	*2279*	Fill of post hole	Pan Tile	4	1630	1850	1630	1850
94	Wall Tile Fabric	Fill of channel	Wall Tile Majolica painted	1	1850	1950	1850	1950
107	*2279*	Posthole	Pan Tile	2	1630	1850	1630	1850
113	*3105*	Fill of Cut	Squared Stone Rubble	1	50	1666	50	1666
197	*2276; 3033*	Made Ground	Well made stock	6	1480	1900	1800	1900

Context	Fabric	Layer	Form	Size	Date range of material		Latest dated material	
			brick and peg tile					
204	*3032; 3034*	Drain	Well made stock brick and stone ashlar	2	50	1850	1666	1850
239	*3032nr3033; 3034*	Fill of gully	Stock brick broken up	3	1666	1850	1666	1850
265	*2279*	Backfill	Pan Tile	1	1630	1850	1630	1850
273	*3033*	Fill of drain	Stock brick	1	1450	1700	1450	1700
342	*2276; 2279*	Silty clay layer	Peg and Pan Tile	20	1480	1900	1480	1900
344	*3114M*	Posthole	White Marble Paving	1	1100	1900	1100	1900
435	*3032; 3033*	Fill of post hole	Machine frogged bricks	3	1850	1900	1850	1900
441	*3032nr3033; 3033*	Early? E-W Wall	Stock moulded bricks early lime mortar	3	1450	1725	1664	1725
442	*3032nr3033;3039; 3042*	Early ? E-W Wall	Stock moulded bricks early lime mortar	5	1450	1850	1650	1850
488	*3261*	Demolition layer	Vitrified Kiln brick	1	1800	1950	1800	1950
490	*3032nr3033; 3033*	Early sunken brick feature (oven ?)	Stock moulded brick early lime mortar	3	1450	1725	1664	1725
507	*1977; 3032; 3032nr3033; 3107*	Drain	Flemish floor tile and reused brick early lime mortar Reused Reigate stone medieval moulding gravel cement	7	1050	1850	1666	1900
527	*3032; 3034*	Masonry N-S Wall	Reused Stock Brick 2mortars one Portland	2	1666	1900	1830	1900
528	*3032nr3033; 3034*	Masonry E-W Wall	Reused stock brick	2	1664	1850	1666	1850
529	*3032nr3033; 3034*	Masonry N-S Wall	Reused stock brick in gravel cement	2	1664	1900	1800	1900
531	*3032; 3034; 3035*	Cobbled surface	Stock moulded Frogged Brick	6	1666	1850	1780	1850
532	*3034*	Half drain	Frogged stock brick	1	1750	1850	1750	1850
538	*3032; 3033; 3035*	Brick and cobbled surface	Frogged and unfrogged stock brick	6	1450	1850	1780	1850
539	*Concrete*	Layer	Concrete	4	1800	1900	1800	1900
540	*3035*	Brick and cobbled surface	Unfrogged London stock brick	1	1780	1850	1780	1850
542	*3261*	Drain	Glazed Kiln brick machined	1	1850	1950	1850	1950
543	*3106*	Fill of posthole	Reused walling stone rubble	1	50	1666+	50	1666+
545	*3261*	Fill of robber trench	Kiln brick slag attached	1	1800	1950	1800	1950
575	*2279*	Backfill	Pan tile	1	1630	1850	1630	1850
586	*2279*	Broken tile and mortar surface	Pan tile	4	1630	1850	1630	1850
593	*3034*	Drain	Narrow Brick	1	1666	1850	1666	1850
595	*3032; 3261*	Brick surface	Machined frogged and kiln	4	1750	1900	1850	1900

Context	Fabric	Layer	Form	Size	Date range of material		Latest dated material	
			brick					
605	*3032; 3032nr3035; 3109*	Edging	Machine Frogged brick and reused Taynton stone medieval column base	4	50	1940	1850	1940
611	*2276*	Bedding	Peg Tile	2	1480	1900	1480	1900
614	*2276; 2279*	Fill of ditch	Abraded Pan and Peg Tile	4	1480	1900	1480	1900
627	*3033*	Layer	Vitrified Stock moulded brick	5	1450	1700	1450	1700
630	*3033; 3039*	Scorched ground	Reused stock brick	2	1450	1700+	1450	1700+
635	*3035*	Drain	Frogged and unfrogged London Stock brick	2	1780	1850	1780	1850
641	*2279; 3036*	Make up layer	Pan tile and Dutch paving brick	9	1600	1850	1630	1850
644	*2279*	Broken tile mortar surface	Pan tile	7	1630	1850	1630	1850
645	*3033*	Early wall foundation	Stock moulded brick	4	1450	1700	1450	1700
692	*3032; 3032nr3033*	Cut for barrel	Stock moulded brick early cement	2	1664	1850	1666	1850
733	*3032nr3033*	Fill Of construction cut for tie-back	Reused Stock moulded	1	1664	1725+	1664	1725+
742	*3120*	Fill of construction cut for tie-back	York stone paving slab	1	1600	1950	1600	1950
748	*2276; 2279*	Broken tile and sandy silt	Peg and Pan Tile	4	1480	1900	1480	1900
751	*3032nr3033;3033;3035*	E-W Wall	Reused stock moulded and fresh brick	3	1450	1850	1780	1850
753	*3032; modern 3033*	E-W Wall	Reused stock moulded and machined brick	3	1666	1900	1850	1900
786	*3032*	E-W Wall	Well made stock moulded brick	2	1666	1850	1666	1850
788	*3032*	Layer	Well made stock moulded brick	2	1666	1850	1666	1850
790	*3032nr3033*	Early E-W Wall Masonry	stock moulded bricks	2	1664	1725	1664	1725
791	*3033*	Early E-W Wall Masonry	Some reuse in Stock moulded bricks	2	1450	1700	1450	1700
830	*Fired clay BM object*	Sandy clay layer	Fired clay BM object unknown	1	?	?	?	?
831	*2271*	Alluvium	Peg Tile	4	1180	1800	1180	1800
836	*2276; 2279*	Gravel and coarse sand	Pan and Peg Tile	4	1480	1900	1480	1900
853	*2271*	Alluvium	Peg Tile	4	1180	1800	1180	1800
857	*Vitrified cannot tell fabric*	Timber Post	Post Medieval brick fragment	1	1450	1900	1450	1900
881	*2276*	Backfill	Peg Tile	1	1480	1900	1480	1900
930	*2586*	Fill of ditch	Peg Tile	1	1180	1800	1180	1800

Context	Fabric	Layer	Form	Size	Date range of material		Latest dated material	
960	*3120*	Fill of Pit	Burnt Kimmeridge shale	1	50	1900	50	1900
961	*3032NR3033*	Fill of pit	Brick	1	1664	1725	1664	1725
991	*3032NR3033*	Wall foundation	Brick	1	1664	1725	1664	1725

16 Appendix 5: glass

CONTEXT	NO FRAGS	COLOUR	COMMENTS	DATE
14	1	green	wine bottle fragment 19th - 20th C	
43	1	colourless	complete half-pint milk bottle with printed label on bottle "MODEL DAIRY W.W.POLL 28 RUCKHOLT R ..LEYTON" etc	20th C
43	1	green	wine bottle fragment	20th C
45	3	brown	bottle glass fragments	19th - 20th C
45	3	green	wine bottle fragments	19th - 20th C
55	1	colourless with a green tint	Complete whisky bottle	L19th - 20th C
55	1	green	Complete bottle, probably sherry or port.	L19th - 20th C
55	1	green	Complete oval-sectioned bottle embossed with a crest and "R.S. & Co Ltd London"	L19th - 20th C
55	1	green	complete French wine bottle	L19th - 20th C
79	1	colourless	complete half-pint milk bottle embossed "L.C.S."	20th C
79	1	colourless	Complete miniature alcohol bottle embossed "BOOTH'S DISTILLERIES LTD LONDON"	20th C
79	1	colourless	Small bottle in the shape of a car, with external screw top, probably perfume bottle	E 20th C
79	2	brown	complete bottle embossed "Lysol" and " SHULKE & MAYR HAMBURG" Makers of cleaning agents	E 20th C
79	2	green	Almost complete bottle embossed with "BATEY LONDON"	L19th - 20th C
79	1	natural pale green	complete bottle embossed "TETLEY LEEDS"	L19th - 20th C
79	1	colourless with a green tint	Complete small square-sectioned sauce bottle	L19th - 20th C
79	1	colourless	complete salt seller with remnants of painted lettering "..ALT"	E 20th C
79	1	colourless with a green tint	bottle fragment embossed with a shield design belonging to J.Mills & Sons Probably soft drinks bottle.	20th C
79	1	colourless	complete small square-sectioned sauce bottle	L19th - 20th C
79	1	brown	complete beer bottle embossed with " BARRETT & CO LIMTD VAUXHALL LONDON"	E20th C
79	1	colourless	complete octagonal-sectioned sauce bottle with external screw top.	L19th - 20th C
79	1	green	complete small R White bottle with internal screw top.	L19th - E20th C
79	1	natural pale green	Almost complete Codd's bottle embossed with "H&F GOMM BETHNAL GREEN"	L19th C
94	2	natural pale green	Almost complete square ribbed ink bottle	L19th - 20th C
94	1	colourless with a green tint	complete small oval-sectioned bottle embossed "ELLIMAN'S EMBROCATION"	L19th - 20th C
94	1	pale blue	complete small oval-sectioned bottle embossed "MASON'S WINE ESSENCES NOTTINGHAM"	L19th - 20th C
94	1	brown	complete small Bovril bottle	c.1930
94	1	colourless	complete small jar probably for meat paste	20th C
94	1	colourless with a green tint	complete camp coffee bottle embossed "PATERSON'S ESS CAMP COFFEE & CHICORY GLASGOW"	L19th - 20th C
94	1	colourless with a green tint	complete small square-sectioned bottle with a cracked off rim.	19th - 20th C

CONTEXT	NO FRAGS	COLOUR	COMMENTS	DATE
94	1	natural pale green	complete R White's carbonated drinks bottle with intact internal screw top.	L19th - E 20th C
94	1	colourless with a green tint	fragment of bottle glass from a medicinal bottle	L19th - 20th C
94	1	colourless	complete small bottle, probably a salt seller, with external screw top.	20th C
94	1	natural pale green	complete carbonated drinks bottle with internal screw top and embossed "BATEY REGD LONDON"	L19th - E 20th C
94	1	green	complete beer bottle	20th C
94	1	natural blue-green	complete ink bottle embossed with "FIELD'S INK & GUM Ro No 660694"	L19th - 20th C
94	1	colourless	complete small pharmaceutical bottle embossed on base with "G.B."	L19th - 20th C
94	1	colourless	complete Pepsi- Cola bottle	20th C
94	1	natural pale green	Codd's bottle embossed "J.MILLS & SONS	L19th - E 20th C
94	1	natural pale green	Embossed with "BARRETT'S B.B.Co Lo" carbonated drinks bottle	L19th - E 20th C
94	1	natural pale green	Rim seems ground on the inside for a stopper	L 19th - E 20th C
94	2	natural pale green	2 complete bottles embossed "J.MILLS LONDON"	L19th - 20th C
105	1	colourless	complete decorative bottle with starburst designs on the sides and base. Probably a cosmetics bottle.	20th C
105	2	natural pale green	1 complete and 1 almost complete square-sectioned bottle embossed "PATERSON'S ESS CAMP COFFEE & CHICORY GLASGOW"	L19th - 20th C
105	1	natural pale green	Complete carbonated drinks bottle embossed "J.MILLS LONDON"	L19th - 20th C
105	2	natural pale green	1 small complete and 1 larger incomplete square-sectioned bottle embossed "PATERSON'S ESS CAMP COFFEE & CHICORY GLASGOW"	L19th - 20th C
123	1	green	carbonated drink bottle fragment.	L19th - 20th C
129	1	green	wine bottle fragment	Mid 18th - 19th C
132	1	green	base fragment of emerald glass from a probable small bottle	19th - 20th C
138	1	natural pale green	Rim and neck fragment from a bottle	L19th - 20th C
179	1	natural pale green	Carbonated drinks bottle fragment	19th - 20th C
206	5	green	wine bottle fragments	17th-18th C
206	1	green	wine bottle fragment with surface weathering.	17th - 18th C
215	1	green	Ovate / egg bottle embossed "…G.HILL …ATERS" probably an aerated water bottle	1870-1900
215	2	natural pale green	Almost complete miniature bottle with cracked off rim	L19th - 20th C
215	1	natural pale green	Codd's bottle embossed "..JAMES.."	L19th C
257	1	green	Base of wine bottle with domed kick	18th C
264	1	natural green	carbonated drinks bottle fragment	L19th - 20th C
298	1	green	wine bottle base fragment	17th - 18th C
298	1	green	wine bottle fragment	18th - 20th C
333	5	green	Very weathered fragments from the bases of wine bottles	Mid 17th - E 18th C
333	16	green	Very weathered body fragments from wine bottles	Mid 17th - E 18th C
341	1	natural pale green	Carbonated drink bottle	L19th - 20th C

CONTEXT	NO FRAGS	COLOUR	COMMENTS	DATE
435	1	natural pale green	Fragment from a large bottle with a short neck and overturned, hand tooled rim	19th C
514	1	green	wine bottle fragment	19th - 20th C
530	1	natural green		19th - 20th C
531	4	natural pale green	Small fragments from bottles	L19th - 20th C
531	1	colourless	Embossed with "..BOV...HAR...ST.."	L19th - 20th C
532	1	green	Straight-sided wine bottle	L19th - 20th C
546	1	natural pale green	Probably a soda bottle	L19th - 20th C
575	2	natural pale green	Adjoining fragments from the base of a straight-sided bottle, possibly a French wine bottle with a high kick and a slight surface patina	L18th - 20th C
584	1	green	Wine bottle base	Mid 19th - 20th C
584	1	green	Base fragment with surface patina	18th - 19th C
584	1	colourless with a green tint	Small probable spirits bottle with a cracked off rim	19th - 20th C
584	3	green	Wine bottle fragments	19th - 20th C
600	1	green	Wine bottle glass with surface patina	L18th - 19th C
600	1	natural pale green	Possible spirits bottle	L19th - 20th C
600	1	natural pale green	Thin neck with very lumpy exterior	20th C?
600	4	pale blue	One fragment has evidence of moulding. All have surface patina	L19th - 20th C
608	1	natural pale green	Soda bottle fragment	L19th - 20th C
614	4	green	Adjoining fragments from the neck and rim of a wine bottle with a short neck and applied string rim. Surface weathering.	L17th C
614	4	green	wine bottle fragments with surface weathering	17th - 18th C
618	1	green	wine bottle fragment	18th - 20th C
627	9	green	Wine bottle fragments with surface weathering	Mid 17th - 18th C
641	4	pale blue	Fragments from a possible case bottle. One has embossed "..ST...AME.."	Mi 18th C - L 18th C
641	5	green	Wine bottle fragments	17th - 18th C
739	1	green	wine bottle fragment with surface weathering	Mid 17th - 18th C
845	1	green	Base of a case bottle with evidence of wear and surface weathering	c 17th C ?
847	2	green	Base and body fragment of a wine bottle. With surface weathering.	Mid 17th - 18th C
921	5	green	5 adjoining fragments - but broken in antiquity and deposited together- from the wine bottle with a kick and surface weathering.	L17th C
930	11	green	wine bottle fragments with surface weathering	Mid 17th - 18th C
930	1	green	Wine bottle with applied string rim and surface weathering.	L17th C
930	1	green	Wine bottle base with a kick and surface weathering	L17th - E18th C
944	2	green	Wine bottle fragments with surface weathering	Mid 17th - 18th C
950	2	green	Wine bottle fragments with surface weathering	Mid 17th - 18th C

CONTEXT	NO FRAGS	COLOUR	COMMENTS	DATE
957	2	green	Adjoining fragments from the body of a wine bottle with surface patina.	18th C
971	1	green	Seal from a wine bottle with "Jam s Barrow 1732"	1732

17 Appendix 6: registered finds

Period 3: late 17th/early 18th centuries				
context	**sf**	**description**	**pot date**	**recommendation**
333	45	copper-alloy ?coin; complete but heavily worn	1630-1680	x-ray/clean
333		copper-alloy sheet/pipe; fragment only	1630-1680	
342		iron strap/binding; two pieces; W 20 and 25mm	1630-1680	x-ray
392		copper-working ?slag; two pieces	1580-1700	x-ray
489		copper-working slag; four pieces		
614		iron nails; two incomplete	1690-1700	
627	63	iron collar; incomplete; diam.60mm; ht.70mm	1690-1730	
627		substantial iron nail; complete; L170mm	1690-1730	
710		iron fitting; complete; circular-section rod; angled at one end and both ends pointed for fixing; L 160mm	1680-1800	further id.
763		iron flat ?object; 40 x 65mm	1580-1910 (ctp)	x-ray
921		copper-alloy ?slag; two small fragments		
930	70	iron ?staple; incomplete; L 75mm	1660-1700	x-ray
930		iron nails; four incomplete	1660-1700	
950		lead sheet waste; small triangular piece	1630-1650	
950		iron nails; two incomplete	1630-1650	
969		iron nails; ten incomplete	1700-1740 (ctp)	
Period 4: 18th century				
context	**sf**	**description**	**pot date**	**recommendation**
670		iron nail; complete; L 60mm		
687		iron nail; incomplete	1760-1780	
788	22	glass thermometer; incomplete		further id.
955		copper-alloy ?slag; several pieces	1570-1700	x-ray
955		iron ?object; 50 x 125mm	1570-1700	x-ray
955		iron nails; two incomplete	1570-1700	
957		copper-alloy ?slag; three pieces	1700-1800	x-ray
957		iron nail; incomplete	1700-1800	
957		lead waste; substantial piece 50 x100mm	1700-1800	
Period 5: late 18th/early 19th centuries				
context	**sf**	**description**	**pot date**	**recommendation**
160	5	copper-alloy coin; George III halfpenny 1806	intrusive in Ph3	
197	42	lead waste	1730-1780 (ctp)	
198	43	copper-alloy buttons; two incomplete; diam.15 and 20mm	1720-1780	x-ray
198		iron nail; incomplete	1720-1780	
531	19	iron washer; complete; diam.45mm	1830-1900	
531	20	lead button-like dress or curtain weight; complete; diam.34mm with two small perforations in a central recess	1830-1900	
531	54	copper-alloy pins with flat heads; two complete; L25mm	1830-1900	
531		iron nails; numerous of varying length and size	1830-1900	
538	55	small metal ?offcuts, bars and straps; eight pieces	1800-1830	
538	56	small rectangular lead type or stamp with 'S.B.&Co.'; complete; 7 x 20mm	1800-1830	
538		iron strap fitting; incomplete; W 10mm	1800-1830	x-ray
567	66	iron ?chisel; complete with rectangular burred head; L 235mm		x-ray
572	61	near-complete iron scale-tang knife with simple rectangular section bone handle; L 155+ mm		x-ray
631	57	small copper-alloy lock plate; complete with two rectangular openings for bolts and a countersunk hole for fixing at either end; 10 x 62mm; probably from casket or small chest	1770-1900	
631		iron horseshoe; incomplete	1770-1900	
641	21	two dished bone buttons with four central perforations; complete; diam. 15 and 17mm	1830-1850	
641	58	copper-alloy strap mount; incomplete; one rivet extant; W 10mm	1830-1850	x-ray
641		two iron rods with pointed ends; L 160 and 170mm	1830-1850	x-ray
641		iron strap/binding; W 23mm	1830-1850	
641		iron nails; numerous of varying length and size	1830-1850	

Period 3: late 17th/early 18th centuries				
context	**sf**	**description**	**pot date**	**recommendation**
702		iron nail; incomplete	1810-1900	
737		iron nail; complete; L 55mm	1770-1840	
739		three iron nails; one substantial complete; L 160mm	1780-1840	
750		flat-section iron ?nail with rectangular copper-alloy washer; complete; L 75mm		x-ray
779		iron nails; three incomplete	1825-1900	
785	59	small ?tin/pewter container with flat base; fragment only		further id.
787		iron nails; numerous		
847		copper-alloy slag	1780-1830 (ctp)	
879	69	iron ?key; incomplete	1780-1900	x-ray
941		copper-alloy slag	1660-1700	x-ray
941		iron ?door fitting; square-section bar; L 105mm	1820-1900	x-ray
964		iron ?object; three pieces	1820-1900	x-ray
Period 6: mid-19th to early 20th centuries				
context	**sf**	**description**	**pot date**	**recommendation**
0		complete iron-shod wooden hame from horse harness collar; L 830mm		
26		iron nails; two incomplete		
43		copper-alloy pin/ wire; L 155mm	1830-1870	
43		iron pins and fittings; four pieces	1830-1870	x-ray
43	80	carbon rod; incomplete; pointed end; diam. 12mm	1830-1870	
55	26	complete tea mug of white-speckled blue enamel; diam.83mm, ht.75mm	1907+	
79	25	near-complete small white enamelled container with blue rim and two handles; diam.90mm	1928+	
79	24	complete lid for red enamelled pan or kettle; diam.140mm	1928+	
79		copper-alloy stud; complete; diam.10mm	1928+	
79		two substantial iron nails/pins; complete; L 215 and 220mm	1928+	x-ray
79	81	two small jet rings; complete; diam.14mm	1928+	
79	82	several hundred minute glass beads; complete; mostly dark blue, grey and turquoise; annular with a handful of hexagonal black	1928+	
90		iron nail; complete; L 50mm	1780-1900	
94	28	small white enamelled coronation 1911 single-handle souvenir cup with George V and Queen Mary; incomplete; diam.75mm; ht.70mm	1884+	
94	29	small crudely made blue//white enamel cup or container; incomplete; diam.75mm; ht.65mm	1884+	
94	31	rectangular enamelled sign; incomplete; white with red lettering '?C A P S T A…'; 50 X 300MM	1884+	
94	30	near-complete rectangular enamelled sign; white with grey lettering 'THIS VALVE MUST ALWAYS BE OPEN BEFORE PUTTING ..INE OR COMPRESSOR INTO ACTION'; 100 X 125MM	1884+	
94	64	substantial biconical iron suspension weight; complete; diam. 75mm; ht.80mm; wt.2.1kg	1884+	
94		substantial iron nail with two rubber washers and 25-mm iron collar; L 150mm	1884+	
94		iron strap fitting or tool; incomplete; curved strap with spike for fixing/handle at one end; W 35mmL 220mm	1884+	further id.
94	83	substantial carbon rod; incomplete; diam.27mm	1884+	
94		complete plastic lid	1884+	
105	37	copper-alloy spoon; complete	1916+	
105	38	copper-alloy token; complete; diam.19mm; obv. stamped "1"; rev. stamped "1002"	1916+	further id.
105	27	base of enamelled ?kerosene lamp; white and gold decoration	1916+	
105		oval blue glass lens; complete; 28 x 35mm; ?sunglasses	1916+	
105		plastic objects, including rectangular yellow sheet/pane; circular 40mm diam. lens/cover; comb and bottle stop stamped 'R. White reg.'	1916+	
114		iron pin/wire; two pieces	1800+	
119		plastic bottle stop; incomplete		
140	2	copper-alloy coin; George V halfpenny	1830-1940	
140	39	domed copper-alloy cap with internal threading; complete; diam.40mm	1830-1940	
144	3	copper-alloy coin; Victoria penny		
179	40	copper-alloy curtain ring; complete; diam.30mm	1830-1900	

180	41	lead ?fishing weight; complete; L 35mm	1780-1900	further id.
181	62	iron wire and wood bird cage door; complete; 85 x 110mm	1820-1900	
181	68	iron s-shaped meat hook; complete; L 110mm	1820-1900	
181	67	heel iron; incomplete	1820-1900	
193	4	bone cutlery scale-tang handle with iron present; hexagonal-section and pistol-shaped with crudely carved initials 'I' and 'H'; L 85mm	1740-1780	x-ray
207	5	copper-alloy coin; Victoria halfpenny 1862		
215	7	copper-alloy coin; ?Victoria penny	1840-1900	
215		coconut shell; one half with central perforation; diam.90mm	1840-1900	
243		iron nails; two complete; L 65 and 100mm	1910+	
253	65	near-complete iron trowel with wittle- tang handle; L 150mm+	1850-1900	
262	44	copper-alloy ?hasp/fitting; wire loop with flattened ends; L 53mm	1800-1900	further id.
264	9	copper-alloy coin; halfpenny	1780-1900	
376	46	copper-alloy curtain ring; complete; diam.35mm	1830-1850	
376	47	conical lead weight; ?sounding lead; complete; ht.50mm	1830-1850	
376		iron nails; five complete; L 45-115mm	1830-1850	
398	48	copper-alloy pin, Caple Type C; complete; L 35mm	1770-1830	
398		iron nail; complete; L 50mm	1770-1830	
461		iron perforated drain cover; complete; diam.350mm		
483	49	small copper-alloy spring and wire; incomplete ?safety pin	1850-1900+	
505	50	lead window came; two pieces; L 100 and 140mm	1630-1680	
514	10	flat jet bead; complete; finely worked trefoil shape with transverse hole; 12 x15mm	1840-1900	
514	11	copper-alloy fittings including small complete wire dress hook and paper fastener	1840-1900	
514	12	copper-alloy pins with flat heads; 49 complete; L 25-30mm	1840-1900	
514	13	small bone disc with central hole; complete; diam.10mm	1840-1900	
514	14	slate pencil; complete; L 70mm	1840-1900	
514	16	copper-alloy two-piece oval locket frame; complete; ht.22mm W17mm	1840-1900	
514	51	small ?tin/pewter container; flat base c.45mm diam.; incomplete and in four pieces	1840-1900	further id.
514		textile; several small pieces including a strip of ?silk with stitched edges	1840-1900	
521	52	copper-alloy pins with flat heads; 19 complete; L 25mm	1800-1900	
521	53	small complete copper-alloy wire dress hook	1800-1900	
532	17	oblong black glass ?bead; incomplete; L 13mm	1830-1900	further id.
545	84	fine greensand stone hone with numerous cut marks; incomplete; 40 x 50mm	1800-1900	
546		textile; strip of ?silk	1840-1900	
584	85	dished shell button with four central perforations; incomplete; diam.15mm	1850-1900	
600	18	copper-alloy coin; Victoria penny	1850-1900	
742		iron strap/fitting; incomplete; W 18mm	1680-1740	x-ray
Unstratified finds				
0	33	copper-alloy coin; complete; halfpenny; Victoria young head or earlier		
0	32	copper-alloy coin; complete farthing; from Slot 3		
0		copper-alloy coins; complete; Victoria penny 1901, halfpennies, farthing		
0	34	copper-alloy curtain ring; complete; diam.28mm		
0	35	silver-plated copper-alloy tea spoon with fiddle handle; complete; stamped 'pluro silver'; L 135mm		
0	60	iron fork with scale-tang bone handle; incomplete; tapering handle L 85mm; three iron rivets extant		x-ray
0	36	lead ?fishing weight; complete; L 35mm		further id.
0	1	lead ?toy figurine of lady with bonnet, apron and basket; near-complete; ht.52mm		further id.
0		substantial lead ?counterbalance weight with rectangular iron suspension loop; diam.145mm ht.100mm; weight 11.5 kg		
0	71	ceramic figurine; incomplete; booted foot and one other fragment		further id.
0	79	bone ring; complete; diam.21mm		
0	73	crudely made bone domino piece; complete; one dot//blank; 15 x32mm		
0	72	double-sided ivory comb; incomplete; W 43mm; 16th–18th centuries		
0	77	jet pin; incomplete; L40mm		
0	78	light-red global glass bead; complete; diam.10mm		

0	74	dished shell button with four central perforations; complete; diam.13mm		
0	75	?stone alleys; two complete; diam.12 and 30mm		
0	76	slate pencil; incomplete; L 35mm		

18 Appendix 7: animal bone

Horse - anatomical distributions by context.

Context	181	198	641	208	239	921	271	831	836	Totals
Period	6	5	5	4	4	3	2	2	2	
skull					1					1
premaxilla										0
maxilla										0
mandible				1	3				1	5
incisor	1			1	11					13
canine					3					3
upper cheekteeth					12					12
lower cheekteeth		1	1	5	7					14
indet.tooth frag.										0
hyoid										0
indet.vertebral frag.										0
atlas										0
axis										0
cervical										0
thoracic										0
lumbar										0
sacrum										0
caudal										0
rib										0
sternum										0
clavicle										0
scapula										0
humerus										0
radius & ulna										0
radius										0
ulna										0
carpal										0
metacarpus										0
innominate										0
femur					1					1
tibia					1	1				2
fibula										0
patella										0
calcaneum					1					1
astragalus					1		1			2
tarsal					1					1
os centrotarsale					1					1
metatarsus III					1			1		2
metapodial					2					2
phalanx I										0
phalanx II										0

Context	181	198	641	208	239	921	271	831	836	Totals
phalanx III					1					1
sesamoid										0
long bone shaft frag.										0
TOTALS	1	1	1	7	47	1	1	1	1	61

Cattle - anatomical distributions by context.

Context	129	505	198	216	533	641	944	964	239	971	333	614	627	271	Totals
Period	6	6	5	5	5	5	5	5	4	4	3	3	3	2	
horn core															0
horn core & skull															0
skull															0
premaxilla															0
maxilla															0
mandible															0
incisor		1	1	1											3
canine															0
upper cheekteeth															0
lower cheekteeth	1					1									2
indet.tooth frag.															0
hyoid															0
indet.vertebral frag.												1			1
atlas															0
axis										1					1
cervical															0
thoracic							1								1
lumbar															0
sacrum															0
caudal												1			1
rib						2		1		2		1	1		7
sternum															0
clavicle															0
scapula						1		1	1		2				5
humerus		1													1
radius & ulna															0
radius					1				1		1				3
ulna															0
carpal															0
metacarpus													1		1
innominate			1								1				2
femur													1		1
tibia											2		1	1	4
fibula															0
patella															0
calcaneum		1													1
astragalus											1				1
tarsal															0
os centrotarsale															0
metatarsus															0
metapodial															0
phalanx I															0
phalanx II															0
phalanx III															0
sesamoid															0
long bone shaft frag.		1	2					1		1			1		6

Context	129	505	198	216	533	641	944	964	239	971	333	614	627	271	Totals
TOTALS	1	4	4	1	1	4	1	3	2	4	7	3	5	1	41

Sheep - anatomical distributions by context

Context	129	193	505	584	197	198	641	702	737	919	944	964	562	333	627	710	929	930	271	842	Totals		
Period	6	6	6	6	5	5	5	5	5	5	5	5	4	3	3	3	3	3	2	1			
horn core																					0		horn core
horn core & skull																					0		horn core & skull
skull	1																				1		skull
premaxilla																					0		premaxilla
maxilla																					0		maxilla
mandible							1														1		mandible
incisor																					0		incisor
canine																					0		canine
upper cheekteeth						1	1														2		upper cheekteeth
lower cheekteeth						2	1						1						1		5		lower cheekteeth
indet.tooth frag.																					0		indet.tooth frag.
hyoid																					0		hyoid
indet.vertebral frag.																					0		indet.vertebral frag.
atlas						1															1		atlas
axis																					0		axis
cervical													2								2		cervical
thoracic																					0		thoracic
lumbar																					0		lumbar
sacrum																					0		sacrum
caudal																					0		caudal
rib		1		1	1		2			1	1	2	3		1						13		rib
sternum																					0		sternum
clavicle																					0		clavicle
scapula				1											1						2		scapula
humerus							1											1			2		humerus
radius & ulna																					0		radius & ulna

radius	1	1	1					1	1												5		radius
ulna																					0		ulna
carpal																					0		carpal
metacarpus		1														1				1	3		metacarpus
innominate				1								1					1	2			5		innominate
femur			1				1					1			1						4		femur
tibia							1				1			1						1	4		tibia
fibula																					0		fibula
patella																					0		patella
calcaneum							1														1		calcaneum
astragalus																					0		astragalus
tarsal																					0		tarsal
os centrotarsale																					0		os centrotarsale
metatarsus																					0		metatarsus
metapodial																					0		metapodial
phalanx I																					0		phalanx I
phalanx II																					0		phalanx II
phalanx III																					0		phalanx III
sesamoid																					0		sesamoid
long bone shaft frag.													1								1		long bone shaft frag.
TOTALS	2	3	2	3	1	4	9	1	1	1	2	4	7	1	3	1	1	3	1	2	52		TOTALS

Pig - anatomical distributions by context.

Context	714	333	614	710	Totals
Period	5	3	3	3	
skull					0
premaxilla					0
maxilla					0

mandible					0
incisor			1		1
canine	1				1
upper cheekteeth					0
lower cheekteeth					0
indet.tooth frag.					0
hyoid					0
indet.vertebral frag.					0
atlas					0
axis					0
cervical					0
thoracic					0
lumbar					0
sacrum					0
caudal					0
rib					0
sternum					0
clavicle					0
scapula					0
humerus		1		1	2
radius & ulna					0
radius					0
ulna					0
carpal					0
metacarpus					0
innominate					0
femur					0
tibia					0
fibula		1			1
patella					0
calcaneum					0

astragalus					0
tarsal					0
os centrotarsale					0
metatarsus					0
metapodial					0
phalanx I					0
phalanx II					0
phalanx III					0
sesamoid					0
long bone shaft frag.					0
TOTALS	1	2	1	1	5

Minor species - anatomical distributions by context.

DOG								
Context (211) Period 1	1 metatasus IV from an adult animal							
Context (215) Period 6								
RABBIT								
Context (521) Period 5								
Cf.FALLOW DEER								
Context (680) Period 5								
BROWN (NORWAY) RAT								
Context (584) Period 6								
PLAICE								
Context (584) Period 6	1 caudal vertebra - chopped							
ROCK DOVE/DOMESTIC PIGEON								
Context (641) Period 5	1 ulna - right; proximal part only							

Measurements (in mm) - Horse dentition (crown heights in horse dentition after method of Levine (1982))

Context (208) Period 4									
Five lower cheekteeth from one animal aged 9 to 10 years									
	Tooth	Side	Crown ht.						
	second premolar	L	30.9						
	second molar	L	45.5						
	third molar	L	45.9						
	second molar	R	44.4						
	third molar	R	46.1						
Context (239) Period 4									
Complete "set" of right & left upper cheek teeth - 2 teeth measured									
	Tooth	Side	Crown ht.						
	second premolar	R	46.4		according to Levine (1982) aged 8 to 9 years - but probably overaged owing to effects of bit wear (?)				
	third molar	L	59.8		aged 7 to 8 years				
	Note: age indicated by upper third molar (7 to 8 years) supported by associated upper right corner incisor, which exhibits 7 year "hook" (or "notch")								
Context (239) Period 4									
Right & left lower cheek teeth from paired mandibles									
	Tooth	Side	Crown ht.		Age (criteria of Levine 1982)				
	second premolar	R	39.9		7 to 8 years				
	third premolar	R	50.8		8 to 9 years				
	fourth premolar	R	64.9		7 to 8 years				
	first molar	R	47.0		8 to 9 years				
	second molar	R	56.4		8 to 9 years				
	third molar	R	54.4		8 to 9 years				
	fourth premolar	L	63.2		7 to 8 years				
	first molar	L	47.5		8 to 9 years				
	Presence of canine teeth indicate a male horse								
	Occlusal tooth row length P2 to M3 = 179.0 mm								

Dentition in dog skull from Context (215) Period 6 (system of von den Driesch (1976))

Tooth		Side	L	B
upper fourth premolar		L	19.2	10.5
upper first molar		L	13.2	15.1

Measurements (in mm) - Post cranial elements (system of von den Driesch (1976))

RADIUS	species	side	GL			Bp	BFp	SD		Bd			context	Phase
	cattle	R				106.2	94.5						533	5
METACARPUS	species	side	GL			Bp		SD		Bd	DSW		context	Phase
	sheep									26.1	28		193	6
	sheep	R				26.5							710	3
	sheep	R				19.5							842	1
TIBIA	species	side	GL	Ll		Bp		SD		Bd	Dd		context	Phase
	horse	R	410.0	368.0		116.9		52.8		95.6	57		239	4
CALCANEUM	species	side	GL			GB							context	Phase
	horse	R	131.9			66.3							239	4
	sheep	L	73.1			21.8							641	5
ASTRAGALUS	species	side	GH	LmT		GB	BFd						context	Phase
	horse	L				65.0	54.5						271	2
	horse	R	70.6	75.4		81.7	62.8						239	4
METATARSAL III	species	side	GL	Ll		Bp		SD		Bd			context	Phase
	horse	R	297.0	289.0		63.6		40.4		62.2			239	4
METATARSAL IV	species	side	GL							Bd			context	Phase
	dog		70.6							8.3			211	1
OS TARSI CENTRALE	species	side				GB							context	Phase
	horse	R				68.5							239	4
OS TARSALE III	species	side				GB							context	Phase

	horse	R				61.2							239	4
Estimated withers heights (cm) in horse bones														
Context (239) [Phase 4]	tibia	160.4 cm												
Context (239) [Phase 4]	metatarsus	154.0 cm		(despite difference in withers ht est. this bone is from the same animal as the tibia above)										

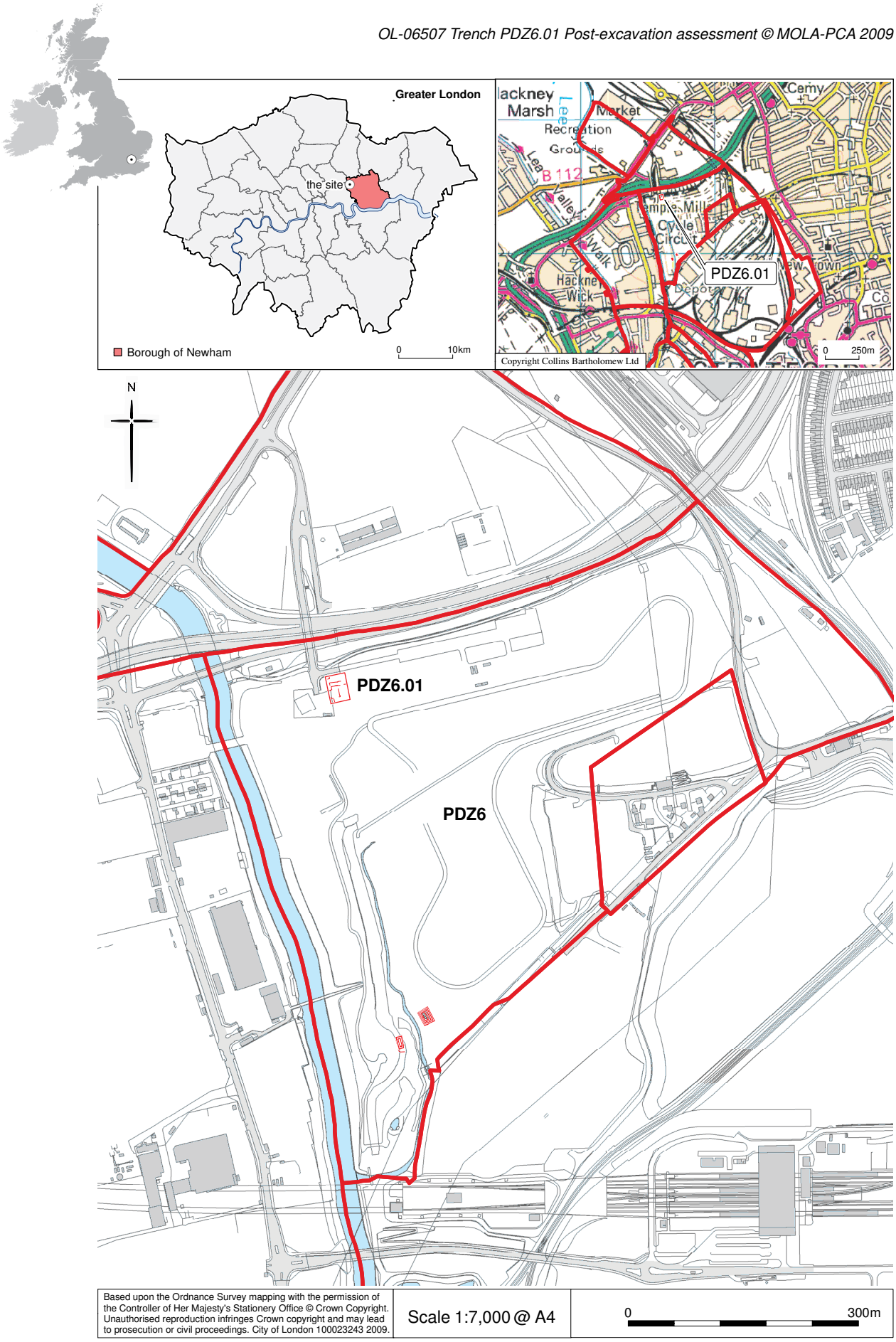
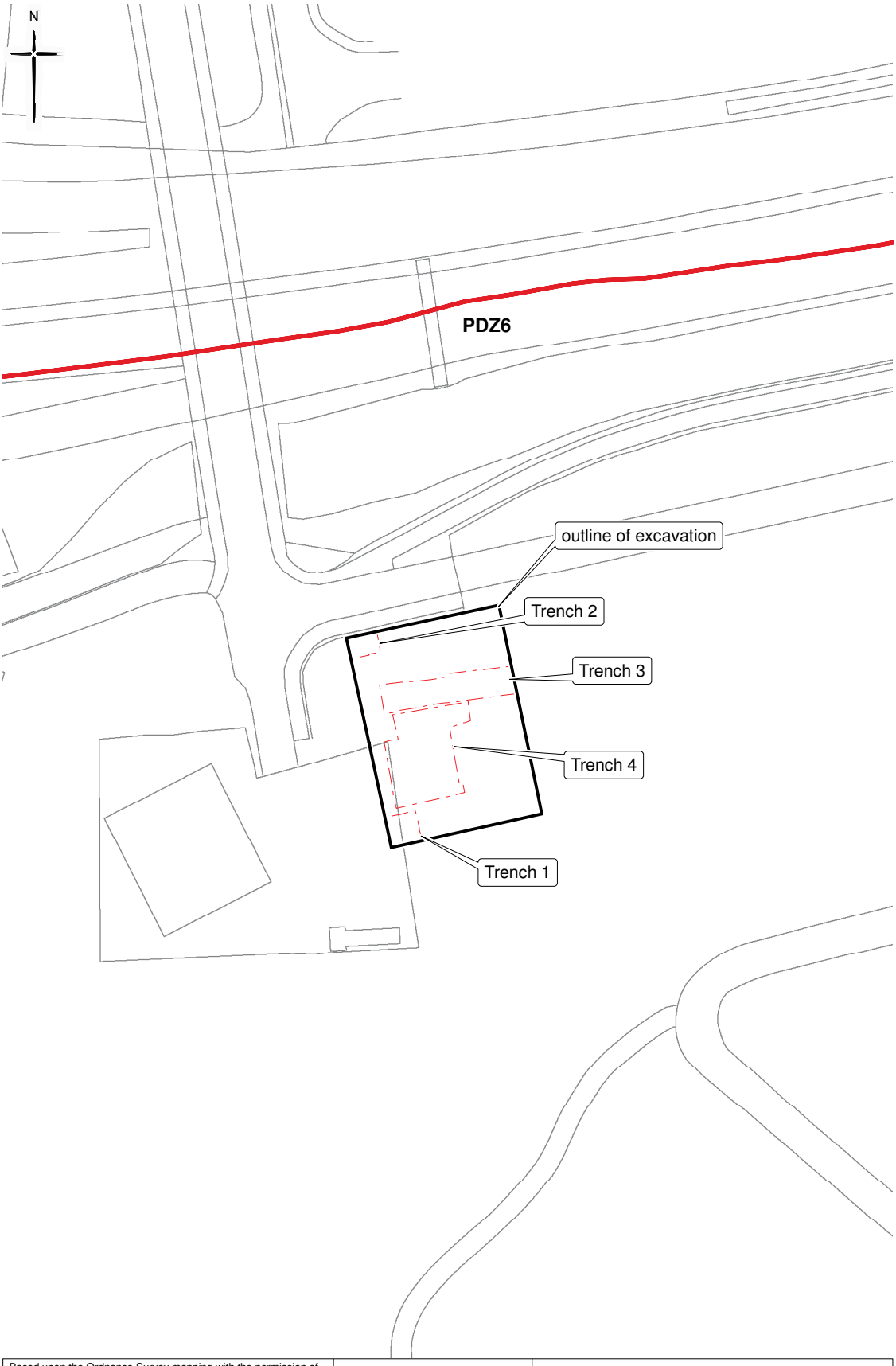


Fig 1 Site location



Scale 1:1,000 @ A4

0 50m

Fig 2 Location of excavation, with trench outlines

Fig 3 Period 2: channel (Trench 4)

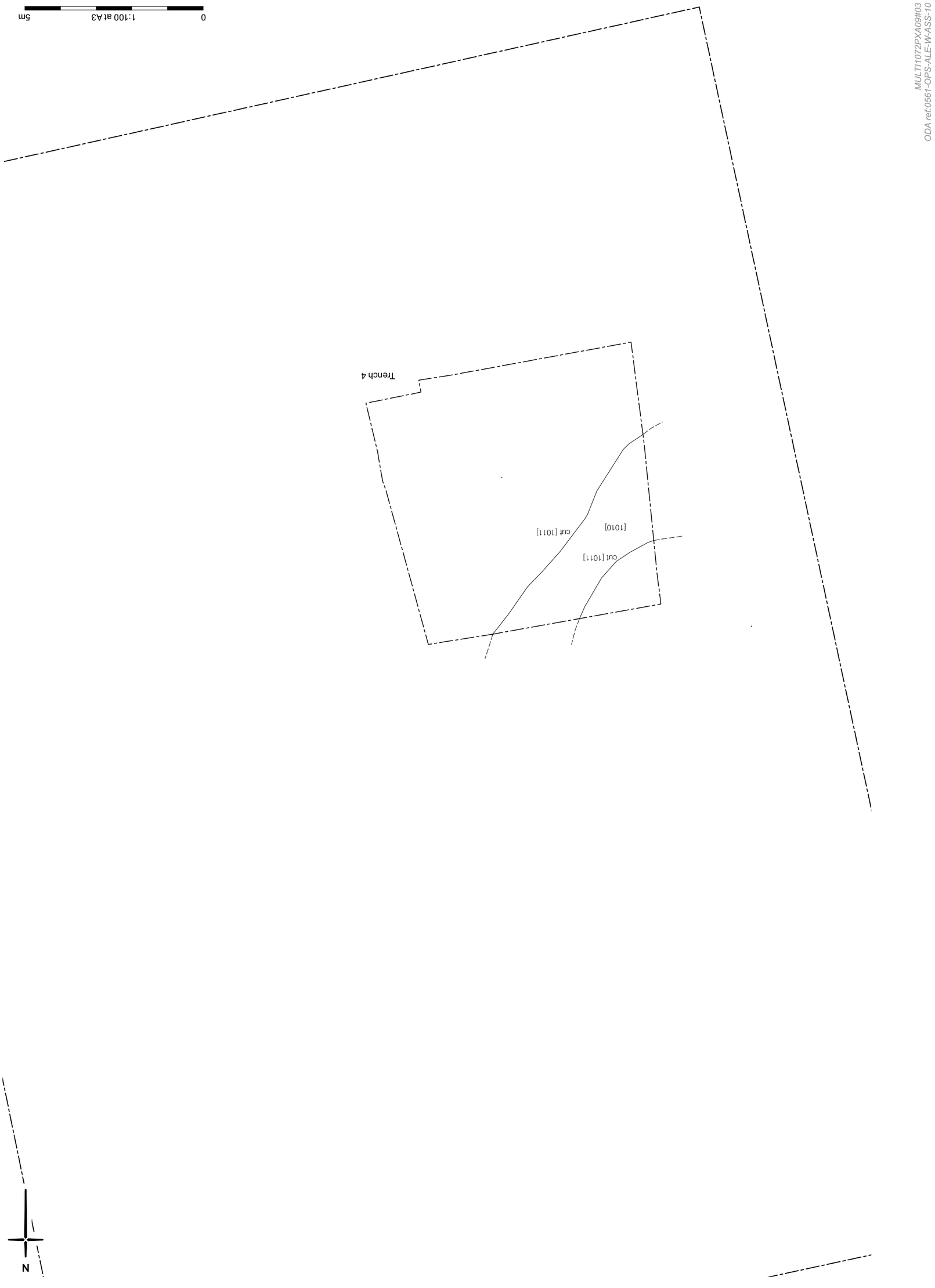


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Fig 4 Period 3: timber pile walkway structure (Trenches 3 and 4)

Fig 5 Period 3: Building 1 and tie-back to revetment

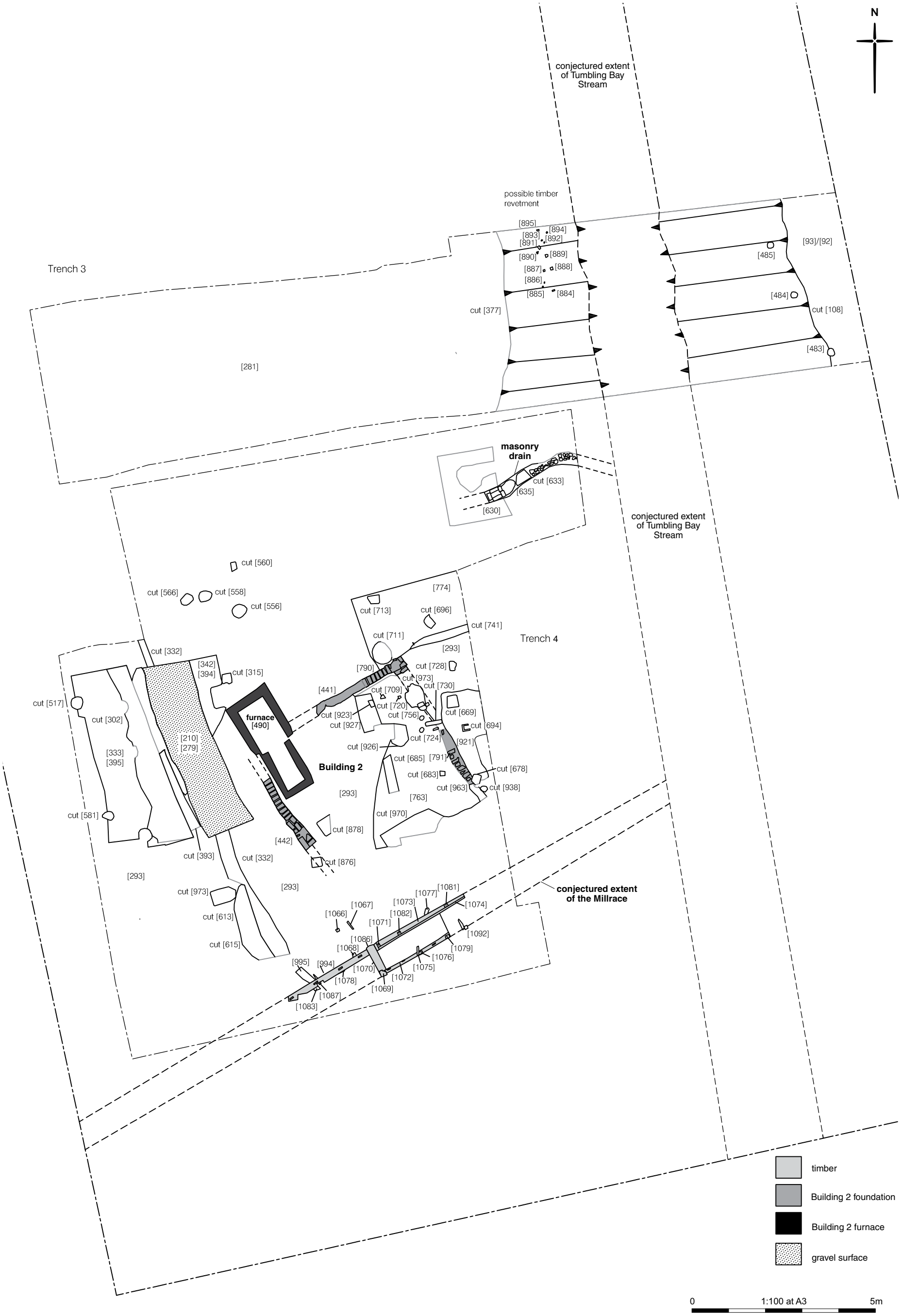

Fig 6 Period 3: Building 2 (with furnace), millrace, masonry drain and Tumbling Bay Stream

Fig 7 Period 4: external features

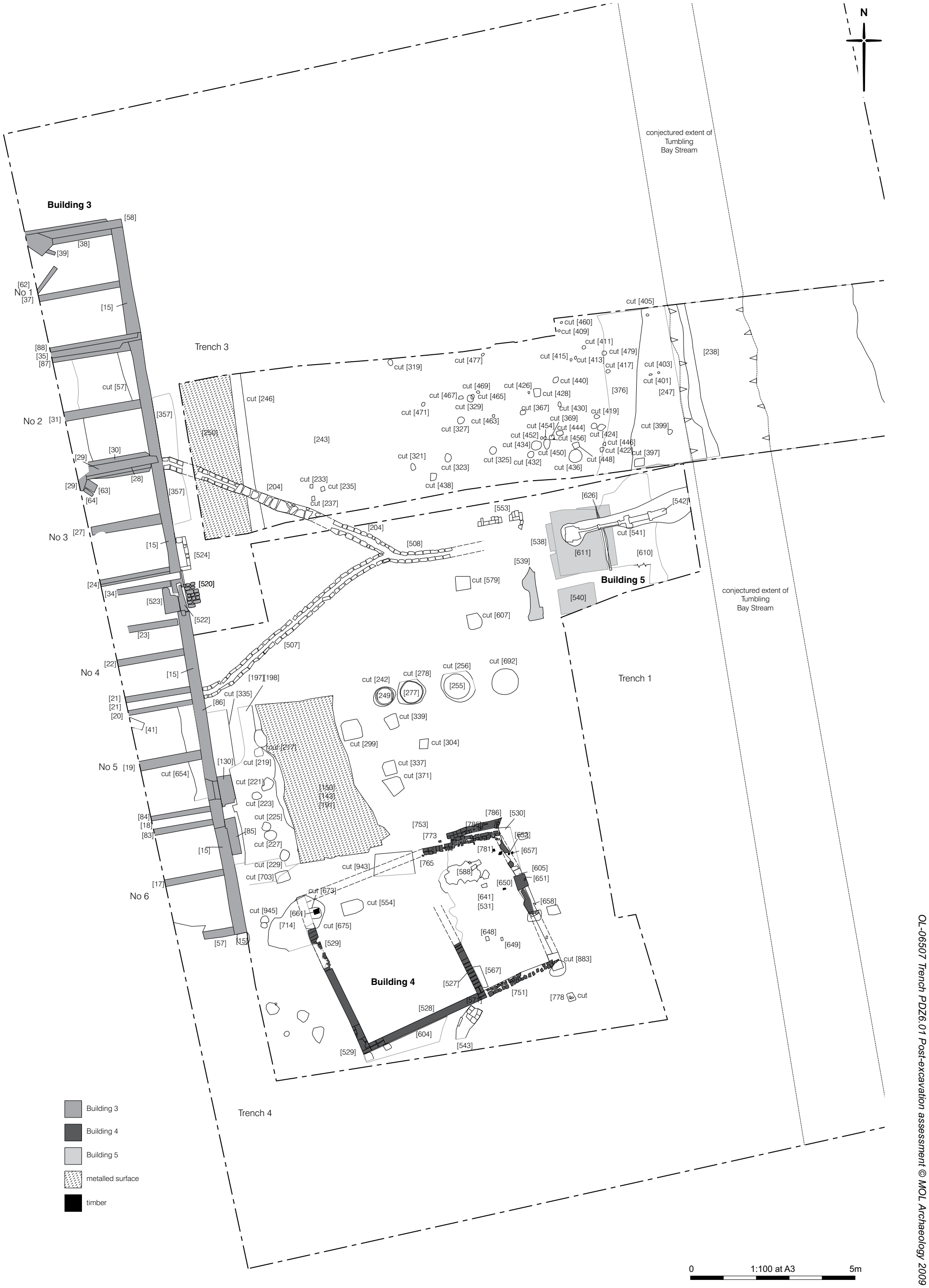

Fig 8 Period 5: Buildings 3, 4 and 5, and associated features, with the retained Tumbling Bay Stream

Fig 9 Period 6: Building 3 with added pavement to east, the Tumbling Bay Stream with new revetment, cobbled road

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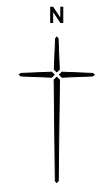
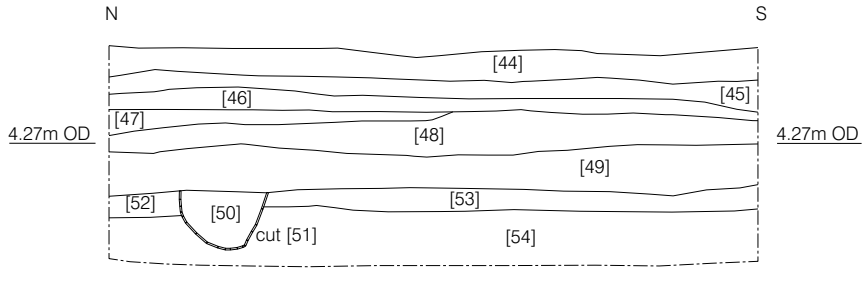
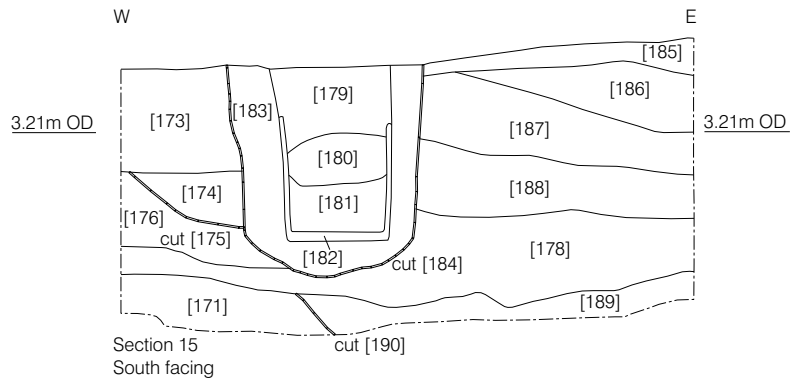
Fig 10 Section locations

MULTI1072PXA09#10
ODA ref:0561-OPS-ALE-W-ASS-10

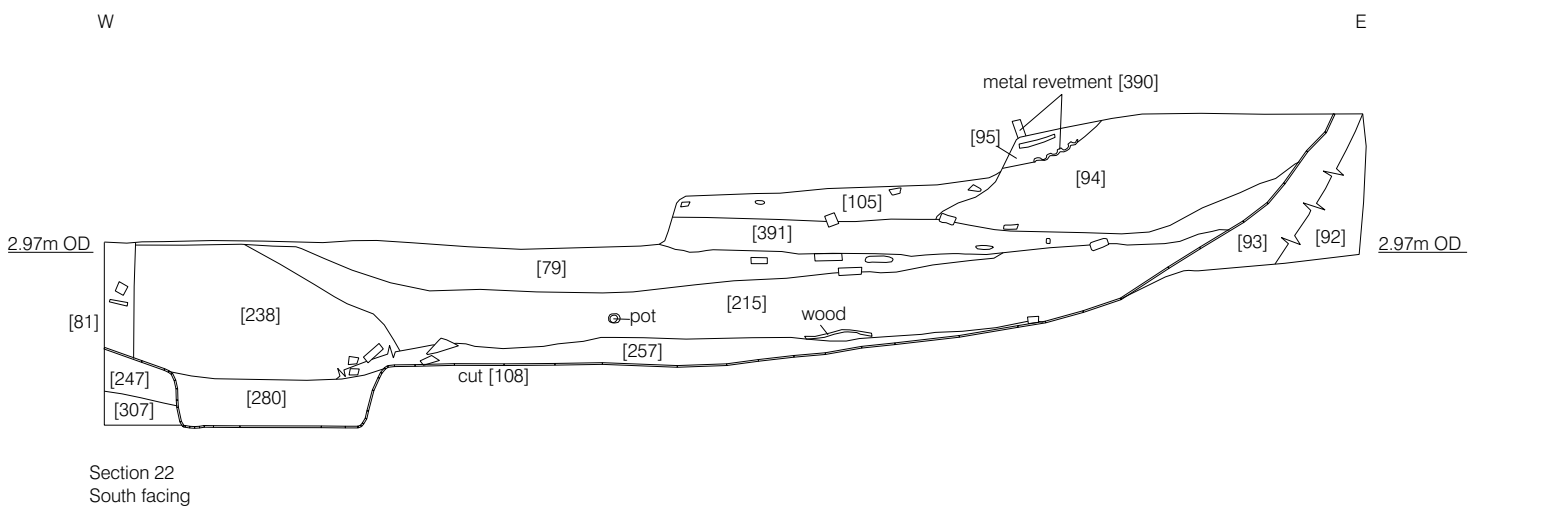




Section 2
West facing



Section 15
South facing



Section 22
South facing

Fig 11 Sections 2, 15 and 22

MULTI1072PXA09#11
ODA ref:0561-OPS-ALE-W-ASS-10

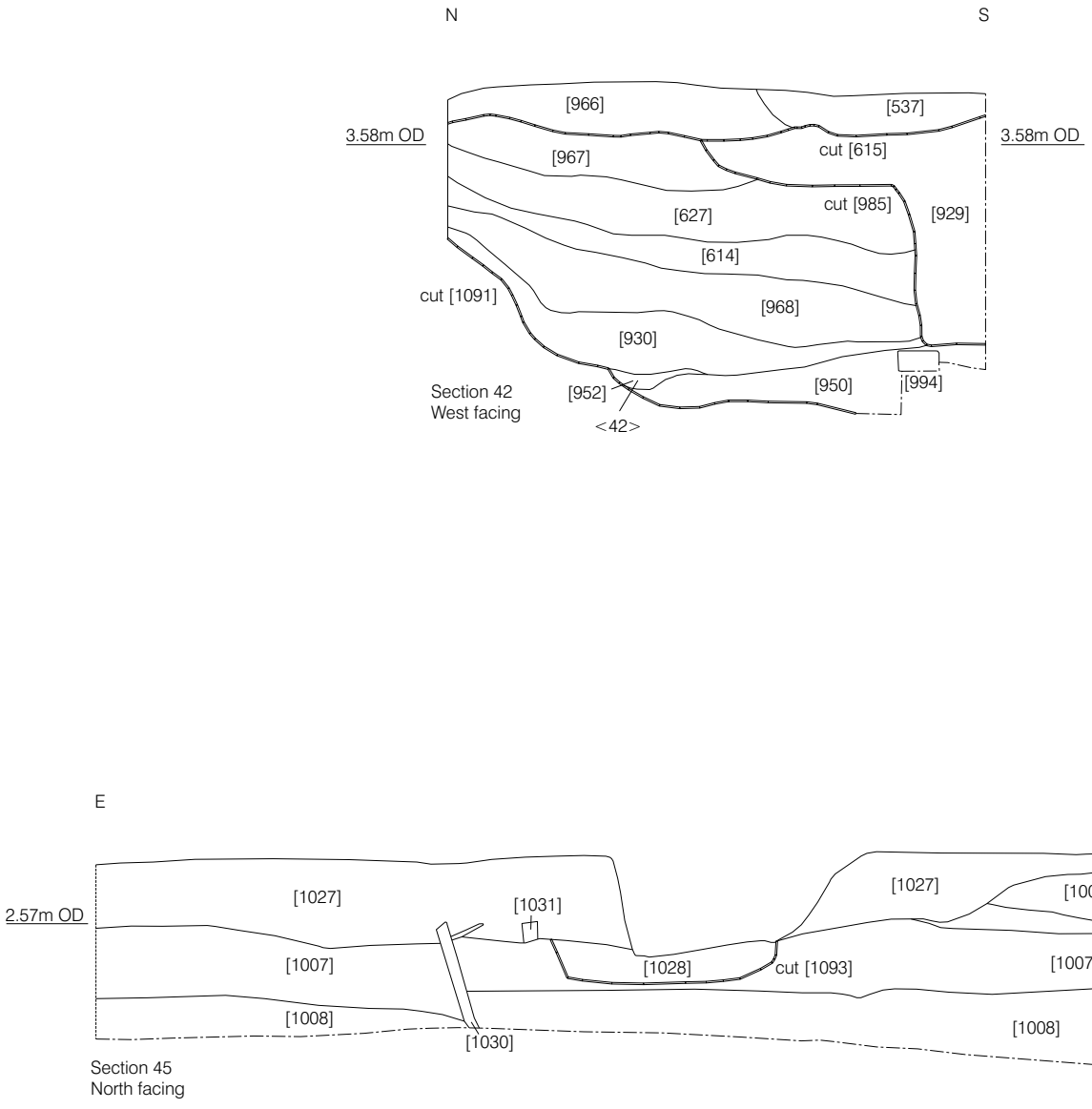
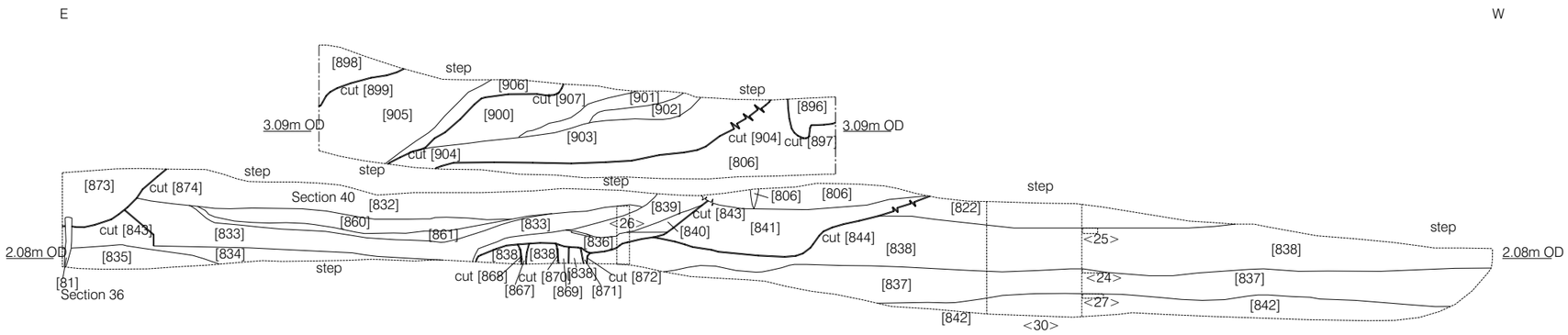
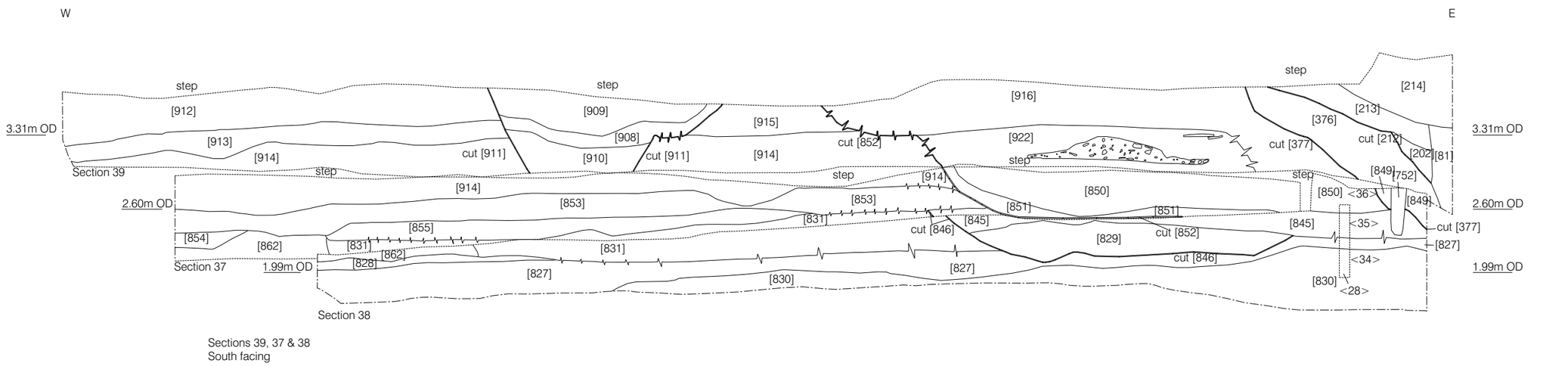


Fig 12 Sections 42, 45 and 50

MULTI1072PXA09#12
ODA ref:0561-OPS-ALE-W-ASS-10



Sections 40& 36
North facing



Sections 39, 37 & 38
South facing

0 2m

Fig 13 Sections 39, 37, 38, 46 and 40