

VAULTS 2, 5 & 9 RAILWAY APPROACH LONDON BOROUGH OF SOUTHWARK



Post-Excavation Assessment

March 2013



Client: Network Rail

THAMESLINK ARCHAEOLOGICAL ASSESSMENT

**Thameslink Archaeological Assessment 1: Archaeological Excavations at
Vaults 2, 5 & 9, Railway Approach, London Borough of Southwark**

Site Codes: BVL10

National Grid Reference: TQ 3266 8031

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1 ABSTRACT

- 1.1 This assessment details the results and working methods of archaeological investigations conducted at Vaults 2, 5 & 9, Railway Approach, London Borough of Southwark. The archaeological work was funded by Network Rail and was undertaken to discharge conditions attached to the planning permission granted for the development for which provision was included in the 'Network Rail (Thameslink 2000) Order 2006' (TWA 2006), as detailed in the 'Written Scheme of Investigation for Archaeological works at Borough Viaduct and London Bridge Station' (NWR 2009b).
- 1.2 The archaeological investigations detailed in this document were centred at National Grid Reference TQ 3266 8031 and constitute 'Thameslink Archaeological Assessment 1 – Vaults 2, 5 & 9, Railway Approach'. Archaeological test pits had previously been excavated on site by MOLA (formerly called MoLAS) (site codes BKV02 & TLK08), whilst archaeological excavations were conducted by OA-PCA within Vault 2 and Vault 5 during 2010, with an archaeological watching brief conducted within Vault 9 during the early part of 2011 (site code BVL10).
- 1.3 The archaeological investigations encountered the uppermost archaeological horizon between heights of 3.78m OD and 1.75m OD, demonstrating the presence of a stratified archaeological sequence measuring between 3.20m and 1.70m in thickness.
- 1.4 The archaeological sequence comprised a series of stratified Roman deposits, mainly of 1st-2nd century date, above the natural gravel of the Southwark north island. These included probable mortar floor deposits, although the interpretation of other potential structural features (including an early post-base) was uncertain. Mid-late 2nd century deposits contained significant quantities of ceramic and other building material, including tile and stone types derived from a high status building. There was limited evidence for late Roman activity, but no Saxon and medieval deposits were present, perhaps as a result of post-medieval truncation. Brick structures of the latter period include a wall and soakaway, a floor and a culvert, mainly associated with deposits of 18th-19th century date.

2 INTRODUCTION

- 2.1 This assessment details the results and working methods of archaeological investigations conducted at Vaults 2, 5 & 9, Railway Approach, London Borough of Southwark. The archaeological work was funded by Network Rail and was undertaken to discharge conditions attached to the planning permission granted for the development for which provision was included in the 'Network Rail (Thameslink 2000) Order 2006' (TWA 2006), as detailed in the 'Written Scheme of Investigation for Archaeological works at Borough Viaduct and London Bridge Station' (NWR 2009b).
- 2.2 The principal objectives of Thameslink are: to reduce crowding on Thameslink and other London commuter services; reduce overcrowding in the underground; reduce the need for interchange between mainline and underground services; to provide new cross-London services, and; to facilitate dispersal of passengers from St Pancras following the completion of HS1. To achieve this, the Thameslink Programme included proposals for substantial construction works in London at Blackfriars Station, Farringdon Station, London Bridge Station and also between Metropolitan Junction and London Bridge Station. The latter includes a new structure comprising a twin-track railway on raised structures between Metropolitan Junction, (Southwark Street), and London Bridge Station. This consists of the following elements: the Park Street & Hop Exchange Viaduct; the Borough Market Viaduct; the Borough High Street Bridge; the Railway Approach Viaduct; and the Station Approach Viaduct. (Fig. 1)
- 2.3 The archaeological assessment phase of the Thameslink project has been divided into 9 geographical areas, each of which is the subject of a separate assessment report. Eight of the areas are in Southwark along the course of the new Borough Viaduct (Assessments 1-7 & 9; Fig. 1), whilst the remaining one is at Blackfriars Station, City of London (Assessment 8). The Assessments incorporate the results of the following archaeological investigations.

Assessment	Site Name	Site Code
Assessment 1	Vaults 2, 5 & 9, Railway Approach	BVL10
Assessment 2	11-15 Borough High St	BVK11
Assessment 3	Pile Cap P, Green Dragon Court	BVJ10
	Pile Caps 1-6 & P, 16-26 Borough High St, Pile Cap 7 1-7 Green Dragon Court; Test Pit 5 (Borough High St); Test Pits 6 & 21 (7 Bedale St)	BVX09
	Pile Caps N1 & N2	BVW09
Assessment 4	2-4 Bedale St	BVG10
Assessment 5	Borough Market	BVF10
	Pile Caps K1, K2, L1, L2, M1 & M2 Borough Market	BVU09

Assessment 6	The Wheatsheaf Rear of 6-7 Stoney St & Test Pits 1-2, 8-9, 13, Stoney St & The Wheatsheaf	BVE11 BVT09
Assessment 7	Arches 12-16 Park St Pile Caps A-H rear of Southwark St & Park St; Test Pits 14 & 17 Redcross Way & Test Pits 10-12, 15-16 Park Street	BVB10 BVQ09
Assessment 8	Blackfriars Station, New Bridge St, Queen Victoria St & Blackfriars North	THB09
Assessment 9	Western Approach Viaduct (formerly Station Approach Viaduct)	BVC12

- 2.4 The archaeological investigations detailed in this document were centred at National Grid Reference TQ 3266 8031 and constitute 'Thameslink Archaeological Assessment 1 – Vaults 2, 5 & 9, Railway Approach,' (hereafter 'The Site') (Fig. 1). The site is situated within vaults located beneath the modern thoroughfare Guildable Manor Street (formerly 'Railway Approach'), with developments fronting London Bridge Street (including New London Bridge House) located to the south-east. Extant properties fronting the junction of Borough High Street and an unnamed continuation of Joiner Street were located to the north-west and suspended above these is an east-west orientated section of the train viaduct feeding out of London Bridge Station. 'Thameslink Archaeological Assessment 2 – 11-15 Borough High Street' is located on the opposite side of London Bridge Street (see OA-PCA-TAA2) whilst 'Thameslink Archaeological Assessment 9 – Western Approach Viaduct' is located a short distance to the east (see OA-PCA-TAA9).
- 2.5 The construction of the Railway Approach Viaduct required that two linked pile caps founded on two pairs of 2100mm diameter piles be constructed within the existing vaults beneath Guildable Manor Street (formerly 'Railway Approach'). The pile caps and piles were located in Vaults 2 and 5 respectively. In addition, a single pile cap founded on six 1500mm diameter piles would be constructed within Vault 9, the variation in design being a consequence of the proximity of London Underground Limited escalators (NWR 2009a).
- 2.6 The construction of the three pile caps was identified as having no archaeological risk, however it was identified that the construction of the piles would remove the full archaeological sequence within the footprint of each pile. As a consequence, above the locations of the piles within Vaults 2 and 5 shored trenches were archaeologically excavated to the top of the natural horizon. In Vault 9, the proximity and 'extreme sensitivity' of the London Underground Limited escalators required that no archaeological excavation was permitted in this location and instead a watching brief, largely to 'identify and recover any

human remains, coffin parts or coffin furniture', was conducted during the drilling of the six piles in Vault 9 (NWR 2009a).

2.7 The archaeological investigations conducted on site comprised:

BKV02 MoLAS: 2002

- Geotechnical test pits (watching brief)

TLK08 MoLA: 2008

- Geotechnical test pits (watching brief)

BVL10 OA-PCA: June-November 2010

- Vault 2 – North (Excavation & Watching Brief)
- Vault 2 – South (Excavation & Watching Brief)
- Vault 5 – North (Excavation & Watching Brief)
- Vault 5 – South (Excavation & Watching Brief)

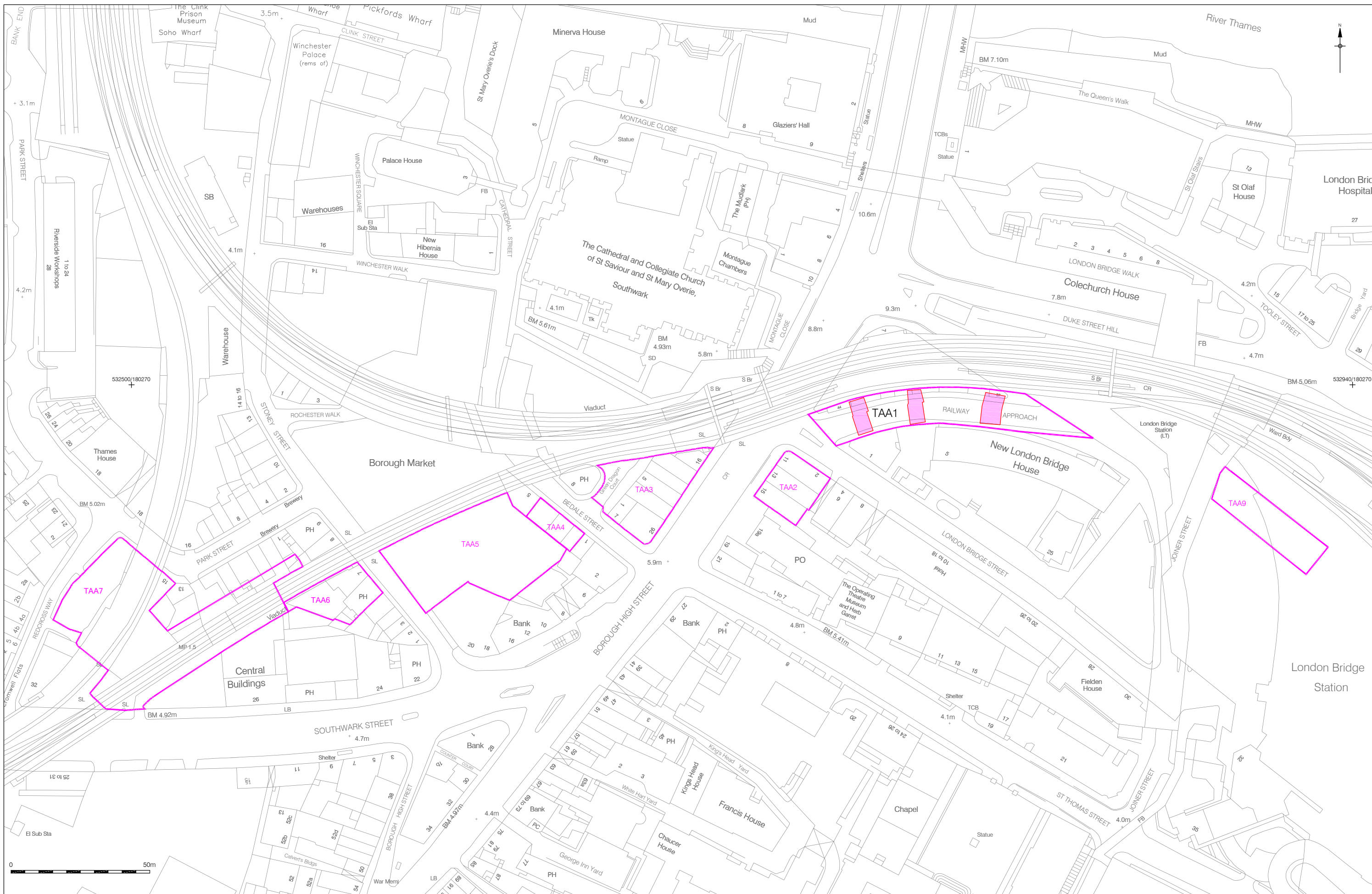
BVL10 OA-PCA: February 2011

- Vault 9 - (watching brief)

2.8 The OA-PCA archaeological site work was supervised by Audrey Charvet and Amelia Fairman, under the project supervision of Joanna Taylor and the project management of Peter Moore and Dan Poore. Chris Place (Network Rail Project Archaeologist) acted as archaeological advisor to Network Rail and the progress of the archaeological investigations were monitored by Dr Chris Constable (Senior Archaeology Officer, Southwark Council).

2.9 This document presents a post-excavation assessment of the stratigraphic record, finds and environmental data from the fieldwork. Further definition of research priorities, schemes of analysis and reporting of the present datasets are detailed in the 'Thameslink Archaeological Assessment: Updated Project Design' (OA-PCA forthcoming).

2.10 The completed archive for 'Thameslink Archaeological Assessment 1' will be deposited at the London Archaeological Archive and Research Centre (LAARC) under site code BVL10. The deposited archives will comprise artefactual material and written, drawn and photographic records.





3 PLANNING BACKGROUND

3.1 The Thameslink Transport & Works Act Order, 2006

3.1.1 Provision for construction of Thameslink was included in the Network Rail (Thameslink 2000) Order 2006 made by the Secretary of State for Transport (17th October 2006). The Secretary of State also directed (22nd November 2006) that planning permission be deemed to be granted for the development provided for in the Order subject to certain conditions. Conditions 25 and 26 required that:

25. No development shall take place in respect of Borough Viaduct until the applicant, or their agents or successors in title, has secured the implementation of a programme of archaeological work in accordance with a written scheme of investigation which has been submitted by the applicant and approved in writing by the local planning authority.

26. No development shall begin in respect of Borough Viaduct until a detailed scheme showing the scope and arrangement of foundation design and all new groundworks and providing for a regime for monitoring the works has been submitted to, and approved in writing by, the local planning authority. The development shall be carried out and monitored in accordance with the approved scheme.

3.1.2 Separate conditions applied to development where planning permission was granted jointly by the Secretaries of State for Transport and Communities and Local Government (17th October 2006). This applies to any archaeological work undertaken in respect of 2-4 Bedale Street, 11-15 Borough High Street and Blackfriars Station.

3.1.3 Only standing building recording was undertaken pursuant to conditions attached to listed building consent and conservation area consent granted by the Secretary of State for Communities and Local Government alone (17th October 2006).

3.1.4 Permission for the alterations and extension to The Wheatsheaf Public House, 6 Stoney Street, was granted on 26th August, 2009 under the Town and Country Planning Act 1990. Provision for archaeological work was contained in condition 5, which required that:

5. The programme of archaeological works detailed in the Written Scheme of Investigation submitted as part of the application, document reference N232/01000/NRT/REP/000007/01 and hereby approved, shall be carried out following the demolition of any of the existing structures currently occupying the site, including the existing single storey rear extension or the upper floor, and prior to the commencement of any development works on site.

3.1.5 At some locations (e.g. 7 Stoney Street, 16-26 Borough High Street) it was shown that the proposed development would not impact archaeological deposits and conditions were discharged without archaeological field work.

3.1.6 The work in Railway Approach was covered by Conditions 25 and 26, above.

3.2 Thameslink, Borough Viaduct & the London Borough of Southwark

3.2.1 Some archaeological work for the Thameslink project in Southwark was undertaken prior to the granting of planning consent and included the compilation of an archaeological desk based assessment (DBA) (MoLAS 2003a), watching briefs on geotechnical investigations (MoLAS 2003b) and an additional DBA compiled for inclusion in the 'Thameslink 2000: Environmental Assessment' (NWR 2004a). Following planning consent, a 'Scope of Works' outlining the 'archaeological baseline and proposed archaeological works' was submitted to the London Borough of Southwark in 2007 (NWR 2007). A watching brief on test pitting was carried out during 2009 (MOLA 2011a).

3.2.2 The 2007 document formed the basis for the:

- Written Scheme of Investigation for Archaeological Works at Park Street & Hop Exchange Viaduct; Borough Market Viaduct; Borough High Street Bridge; Railway Approach Viaduct (NWR 2009a).
- Written Scheme of Investigation for Archaeological Works at Borough Viaduct & London Bridge Station, London Borough of Southwark (NWR 2009b).

3.2.3 Following approval from Southwark Council, the archaeological mitigation of the Borough Viaduct sites began in 2009 and Dr Chris Constable, Senior Archaeology Officer at Southwark Council monitored the archaeological works throughout.

3.2.4 The Railway Approach excavations cover part of the 'Borough High Street Bridge - East Abutment' section of Thameslink Borough Viaduct and also part of the 'Railway Approach Viaduct' section. Vaults 2 and 5 were located within the footprint of the east abutment and Vault 9 was located within the footprint of 'Railway Approach Viaduct'.

3.3 'Borough High Street Bridge - East Abutment'

3.3.1 The Written Scheme of Investigation (NWR 2009a) detailed the construction and archaeological impact of the east abutment as:

Proposed Works

'... a 3500mm thick pile cap founded on 2 No. 2100mm diameter piles linked to a second 3500mm thick pile cap, also with 2 No. 2100mm diameter piles— both are to be constructed within the existing vaults. The bases of the pile caps are at approximately 3.15m OD and 3.89m OD respectively...'

Potential Impacts

'... (The) pile caps will be cast in the existing arches beneath the road and will not impact on archaeological deposits. The large diameter piles will impact through the whole sequence...'

Archaeological Works

'Archaeological excavation by the Archaeological Contractor will be confined to the footprint of the large diameter piles and will be undertaken within sheeted and securely braced excavations...'

3.4 Railway Approach Viaduct'

3.4.1 The Written Scheme of Investigation (NWR 2009a) detailed the construction and archaeological impacts of the Railway Approach section as:

Proposed Works

'... A single 2500mm thick pile cap (constructed in the existing vaults) founded on 6 No. 1500mm diameter piles... The underside of the pile cap will be at approximately 3.75m OD...'

Potential impacts

'The pile cap will be cast in the existing arches beneath the road and will not impact on archaeological deposits. However, the proposed piles are likely to impact the full sequence of significant deposits. It is possible that piling will disturb human remains, either as disarticulated reburials in charnel pits, or as undisturbed burials in coffins.'

Archaeological Works

'The pile cap is very close to existing London Underground Limited escalators and discussions have been undertaken with LUL in order to agree the extent of excavations which can be undertaken for archaeological purposes. Recent meetings with LUL have confirmed that due to the extreme sensitivity of the escalator equipment to ground movement they would not permit excavation in this location.'

Notwithstanding this, provision will still need to be made for any human remains that are disturbed to be treated with proper respect in accordance with common law. Mindful of this, and following advice provided to the Thameslink project by the Ministry of Justice, the following procedure will be adopted:

1. *The Site will be screened from public view.*
2. *The work shall be monitored by the Archaeological Contractor to identify and recover any human remains, coffin parts or coffin furniture.*

3. *Arisings shall be examined by the Archaeological Contractor to recover any additional human remains prior to the approved disposal of the arisings.*
4. *Freshly made disinfectant shall if necessary be sprinkled over the coffins and soil.*
5. *The human remains will be interred in the precincts of Southwark Cathedral. In any intervening period, for instance during scientific research, they shall be kept safely, privately and decently.'*

4 GEOLOGY AND TOPOGRAPHY

4.1 Geology

- 4.1.1 London is located within the Thames Basin, a broad syncline of chalk filled by Tertiary sands and clays, which is overlain by the Pleistocene (Quaternary) gravel terraces of the River Thames. The low-lying area to the south of the Thames was characterised as largely marshland, with ground level being c.14m lower than the north bank (MoLAS 2003a).
- 4.1.2 The original river was shallower, slower and wider than its modern manifestation and flowed through braided channels which surrounded the low-lying gravel eyots located beneath modern Southwark. Archaeological excavations and geotechnical work have established that there were two principle gravel eyots, covering an area of c.16 hectares (MoLAS 2003a).
- 4.1.3 Thameslink Borough Viaduct is located within the boundaries of the northern eyot, which is variably known as the 'Bridgehead Island' (MoLAS 2003a) or 'Northern Island'. The island extends between Joiner Street to the east and Southwark Bridge Road to the west, Union Street and Southwark Street to the south and the River Thames to the north.
- 4.1.4 The Borough Viaduct sites are generally located within areas of high-ground, with the natural sands and gravels occurring between 1.00m-1.20m OD and the land set back from the tidal channels, at a distance removed from the surrounding foreshores. When untruncated natural deposits occur below these heights, it is generally an indication that the land surface is 'dropping' towards a channel edge and it can be assumed that the land would have been susceptible to flooding, especially during high-tides.

4.2 Topography

- 4.2.1 The site is situated within vaults located beneath the modern thoroughfare Guildable Manor Street (formerly 'Railway Approach'). Concrete surfaces within Vaults 2, 5 and 9 were removed prior to the archaeological work commencing and the surface level of the vaults is therefore unknown. However, ground level following the removal of the concrete was encountered between 2.80m OD – 3.78m OD in the north of the site and 1.77m OD – 2.12m OD in the south of the site. The lower heights in the south are reflective of truncation levels rather than topographic variation. The road above the vaults is present at c.7.40m OD in the south-west and c.9.60m OD in the north-east.
- 4.2.2 The site is located on the eastern side of Borough High Street, approximately 135m to the south of the River Thames. The projected location of the now buried Guy's Channel is situated c.100m to the east, whilst the projected location of the now buried Southwark Street Channel is located c.170m to the south.

5 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

5.1 Introduction

5.1.1 The archaeological and historical background for the Borough Viaduct sites has been compiled largely through reference to site excavations in the vicinity. However, a wealth of publications discussing the archaeology of Southwark, some of which are occasionally referenced in this text, do exist and will require full consideration and incorporation during the post-assessment process.

5.2 Prehistoric

5.2.1 During the prehistoric periods the area of land now occupied by Southwark was typified as a series of variably sized, sandy islands separated by a network of channels. The tidal nature of the River Thames and its associated channels would have ensured that during high tide the land remaining above sea level was significantly reduced, a limiting factor for defined prehistoric occupation and settlement. However, the marshland environment created within the tidal range would have provided significant economic attractions and it is probable that prehistoric communities exploited the island landscape at low tide (Sidell *et al.* 2002, 7).

5.2.2 The 350m length of the Borough Viaduct covered by Assessments 1-7 and 9 is located within the boundaries of the northern island. Within this area there is a relatively small amount of evidence for *in situ* prehistoric activity and that which exists is largely clustered to the north-east and west. This distribution of prehistoric findspots is not entirely unexpected as these parts would have been more closely located to the economically attractive and opportunistically exploited island foreshore.

5.2.3 At the north-east extent of Borough Viaduct to the east of Borough High Street, i.e. relatively close to the north-east edges of the island, prehistoric findspots have been made around London Bridge (Fig. 3; Site 1/LBD95; Site 2/LBE95), London Bridge Street (Fig. 3; Site 3/LBB95; Site 4/LWE07; Site 5/LBN08) and St Thomas Street (Fig. 3; Site 6/4STS82; Site 7/11STS77). The corpus of evidence consists of occasional prehistoric peat and silt horizons, a small number of ephemeral cut features, quantities of burnt flint and a small assemblage of largely undated struck flint, some of it residual. A Bronze Age loomweight was amongst the finds assemblage from the London Bridge Street excavations, whilst Iron Age pottery has been found along St Thomas Street, datable finds which may give an indication of when the eastern foreshore was being exploited. The presence of Iron Age pottery at Kings Head Yard may further support an assumption that the eastern foreshore was being exploited during the late prehistoric period.

5.2.4 A relative dearth of prehistoric findspots have been made to the west of Borough High Street, and indeed the only evidence of the prehistoric period is limited to the presence of flood

deposits at 22 Borough High Street (Fig. 3; Site 9/22BHS88) and 15 Winchester Walk (Fig. 3; Site 10/BYI03). There are many possibilities for this lack of evidence, not least that any evidence of prehistoric activity may have been destroyed by subsequent development or even that the protected nature of the modern landscape has resulted in a lack of archaeological excavation in the vicinity. Alternatively, it is perhaps more probable that this part of the island landscape was not economically attractive and the lack of prehistoric material from areas of higher ground, i.e. the central parts of the island, simply reflects a lack of prehistoric activity.

- 5.2.5 Close to the western extent of Borough Viaduct, i.e. the south-west of the island, evidence of early prehistoric activity has been found on excavations at the former Courage Brewery, Park Street (Fig. 3; Site 11/CO87/CO88; Site 12/CO89; Site 13/CSW85; Site 14/COSE84). Neolithic tools and fire pits, silts containing a leaf-shaped arrowhead and Late Bronze Age flints and a peat horizon were recorded, suggesting that opportunistic fishing, hunting and/or foraging occurred along the foreshore during the earlier prehistoric periods (Sidell *et al.* 2002, 60).
- 5.2.6 The Courage Brewery site also produced evidence of a Late Iron Age boundary ditch, a possible roundhouse and a fenceline, later prehistoric activity suggesting that management of the economic resources was being undertaken. Evidence of channel revetting further south on Redcross Way (Fig. 3; Site 15/REW92) could also relate to late prehistoric land management, whilst a Late Iron Age boundary ditch and possible fenceline at the former Calverts Buildings on Southwark Street (Fig. 3; Site 16/SKS80) may form a continuation of those recorded at Courage Brewery (Beard & Cowan 1988, 376).

5.3 Roman (AD 43-AD 410)

- 5.3.1 Despite the evidence for Late Iron Age exploitation of the Southwark landscape, it seems that the London area lay on the periphery of occupation areas at the end of the prehistoric period. Whilst many Roman towns were founded in centres of Iron Age power it is possible that the peripheral nature of the London area may have ensured it was essentially neutral and, whether by chance or through planning, this may have ultimately contributed to Roman London's subsequent importance within the province.
- 5.3.2 For many years studies of Roman London have focused on the importance of the north-bank settlement, treating the contemporary settlement at Southwark simply as a suburb. However, preconceptions and assumptions regarding the role, status and integration of Southwark within Londinium have been addressed over the past decade and the most recent map of Roman London (MOLA 2011b) shows Roman Southwark as an integral part of Roman London.

- 5.3.3 Roman occupation in Southwark is currently accepted as beginning around AD 50. By this time a number of military roads leading from the south coast had been established, i.e. Watling Street and Stane Street, whilst a north/south orientated precursor of Borough High Street, i.e. Road 1, connected the convergence of these roads with the River Thames. A military involvement in constructing this road network is little doubted and it has been argued that a major fort would have existed in the area (Sheldon 1978, 28), however no definite evidence of a military presence has as yet been identified. Instead, rather than being military in origin, early settlement in Southwark most probably occurred as a mixture of both military and civilian endeavour, prompted by the strategic and economic importance that an established river crossing brought to the area (Yule 2005, 86; Cowan 2003, 81).
- 5.3.4 Broadly speaking initial development during the mid 1st century comprised the construction of timber buildings adjacent to the new roads, with the remainder of the island existing as intertidal mudflats bound by the naturally formed river channels (MoLAS/EH 2000, 127, 147). By the time of the Boudican revolt in AD 60/61 a bridge crossing the Thames would probably have connected the south-bank and the north-bank settlements and it is highly probable that both would have suffered during the rebellion (Drummond-Murray *et al.* 2002, 40, 46, 51).
- 5.3.5 Regardless of the impact that Southwark may or may not have suffered during the Boudican revolt, the subsequent decades were characterised by an intensification and expansion of occupation within the settlement. From the late 1st century, land between the islands was steadily reclaimed (MoLAS/EH 2000, 127, 147), channels were revetted, a second main road (Road 2) leading in a NE/SW direction from the bridgehead was established and the settlement expanded across the previously tidal mudflats (MoLAS/EH 2000, 133; Drummond-Murray *et al.* 2002, 54). Evidence indicates that the settlement was comprised of a mixture of timber and masonry buildings from the late 1st century through to the 3rd century and it seems that a diverse population resided within the south-bank settlement throughout this time (Drummond-Murray *et al.* 2002, 149; Hammer 2003, 13; Cowan *et al.* 2009). As well as being places of residence, many of the buildings served a commercial or industrial purposes, whilst at least some of the masonry buildings may have served a civic or public function (Yule 2005, 86).
- 5.3.6 The Thameslink archaeological investigations of Borough Viaduct essentially transect the northern island of Roman Southwark and to enable a more coherent discussion of the available excavation data it has been necessary to identify 'zones' within the settlement, each of which is discussed below.

Road 1

- 5.3.7 The importance of Road 1 to the emergence of a Roman settlement at Southwark should not be underestimated, for as a vital connection between the important roads leading from the south coast to the river crossing the subsequent emergence of a road-side settlement was

perhaps inevitable. Whilst the alignment and location of Road 1 roughly correlates with modern Borough High Street, the original Roman road was considerably narrower and was, for the most part, situated beneath and within land adjacent to the western part of the modern thoroughfare.

- 5.3.8 The archaeological remains of Road 1 have been exposed during watching briefs within Borough High Street (Fig. 3; Site 27/BSE94), excavations at 1a Bedale Street/2 Southwark Street (Fig. 3; Site 17/2SSBS85), Southwark Cathedral (Fig. 3; Site 18/MTA99; Divers *et al.* 2009, 12) and also during archaeological excavations associated with the Jubilee Line Extension (Fig. 3; Site 19/STU92; Site 20/JSS92). Collectively, these have demonstrated that Road 1 was constructed on c.2 layers of timber, overlain by c.1.5m of road gravels representing numerous episodes of make-up and metalling. The road was flanked by road-side ditches/box drains.

The eastern frontage of Road 1 and its surround

- 5.3.9 As part of the Jubilee Line Extension, an excavation was conducted within Borough High Street at the junction with Bedale Street and St Thomas Street. The excavations demonstrated that the earliest Roman activity on site consisted of quarrying, most probably in association with the construction of Road 1. Archaeological evidence indicated that the eastern frontage of Road 1 was soon developed with timber strip buildings; however, these were destroyed before AD 70, possibly during the Boudican revolt. The timber buildings were rebuilt during the late 1st century and served a mixture of residential, commercial and industrial purposes and possibly included a 'market hall'. At the same time a colonnade was constructed between the buildings and Road 1 whilst during the 2nd century some of the buildings were rebuilt in stone, of which at least some were adorned with mosaic floors (Fig. 3; Site 21/BGH95).
- 5.3.10 To the east and north-east, evidence is coming to light which suggests that land set back from Road 1, i.e. in the London Bridge Street area and to the north of St Thomas Street, was extensively developed with high-status masonry buildings. Recent excavations at 25 London Bridge Street (Fig. 3; Site 5/LBN08) have recorded evidence of 'several' 2nd century masonry buildings, some with tessellated floors and one with a hypocaust. Elsewhere along London Bridge Street, 1st and 2nd century timber and masonry buildings have been recorded at No.8 (Fig. 3; Site 22/LOB98), whilst a 2nd century drain and postholes have been recorded at Nos.10-18 (Fig. 3; Site 23/LNB97). Excavations at No.32 (Fig. 3; Site 4/LWE07) recorded only alluvial and dumping deposits, however the presence of box flue tile within the dumped deposits were thought to indicate the existence of a bathhouse in the vicinity (Wylie 2009; 2010).
- 5.3.11 The archaeological evidence along St Thomas Street is less extensive, however excavations conducted at Nos.1-7 in 1974 (Fig. 3; Site 24/1STS74) and Nos.11-19 in 1977 (Fig. 3; Site

7/11STS77) have demonstrated that Roman masonry buildings are present, whilst a more recent watching brief at St Thomas's Church (Fig. 3; Site 25/TAS08) found possible evidence of timber buildings. Further to the west at the junction of St Thomas Street and Borough High Street, a 1994 watching brief (Fig. 3; Site 27/BSE94) found evidence of multiple phases of mid-late 1st and 2nd century timber buildings, a late 1st/early 2nd century masonry structure and an opus signinum floor. A number of findspots have also been made at the junction of St Thomas Street and Borough High Street, including a tessellated pavement discovered 10ft below ground in 1819, a Roman stone and brick building found in 1840 and reference to Roman buildings, a ditch and a well in 1920 (Fig. 3; Site 28/GLSMR090223). In addition, a number of chance Roman finds have also been attributed to the junction of St Thomas Street and Borough High Street, including a Roman armlet, hairpins and a jet spindlewhorl (Fig. 3; Site 26/GLSMR090375/6/7).

- 5.3.12 Additional evidence of multiple phases of mid-late 1st century and 2nd century timber buildings along the eastern frontage of Road 1 have also been found during watching briefs further south along Borough High Street (Fig. 3; Site 29/BUG94; Site 30/BTJ93). In addition, a short distance to the east of these, 1st century timber buildings with 2nd century masonry additions were recorded to the rear of 4-26 St Thomas Street (Fig. 3; Site 6/4STS82). Further evidence of masonry buildings set back from the main street frontage were recorded at King's Head Yard in 1879-81, 1945 and 1982 (Fig. 3; Site 8/KHYST82) whilst further evidence of buildings were recorded at White Hart Yard in 1985 (Fig. 3; Site 31/WHY85).

The north-east marshland & waterways

- 5.3.13 The north-east is defined as the area of land situated behind the Road 1 frontages and its extended surround (see above), being bound to the north by the Thames foreshore and to the east by Guy's channel. This area of land was naturally marshy and as a consequence it is unsurprising that Roman waterlain deposits and drainage features have been encountered on numerous excavations along the eastern parts of London Bridge Street (Fig. 3; Site 4/LWE07; Site 32/LBJ95; Site 33/LBA95; Site 35/NLB91) and St Thomas Street (Fig. 3; Site 36/TOM95), as well as the Joiner Street (Fig. 3; Site 34/LBH94; Site 37/MSA92) and London Bridge Station (Fig. 3; Site 1/LBD95; Site 2/LBE95) areas.

- 5.3.14 Beyond the marshy land, archaeological remains indicate that parts of the southern frontage to the Thames and the western frontage of Guy's channel were developed with buildings. Along Tooley Street the remains of timber and masonry buildings fronting onto the Thames have been recorded (Fig. 3; Site 38/DHS75), whilst at the northern extent of Guy's channel the remains of a 1st century timber structure and a 2nd century masonry building with mosaic floor have been recorded at Joiner Street (Fig. 3; Site 37/MSA92). Further to the south, a 2nd century masonry building, was recorded at London Bridge Street (Fig. 3; Site 2/LBE95) and additional evidence of a masonry building close to Guy's channel was found during

excavations at 25 London Bridge Street (Fig. 3; Site 35/NLB91). Excavations at 20-26 London Bridge Street exposed the remains of a robbed-out mid/late 1st century masonry building, with subsequent late 1st century and 2nd century timber buildings (Fig. 3; Site 39/LBI95).

- 5.3.15 The river and its channels undoubtedly served an important role as a trade and communication supply, well demonstrated by the existence of the abandoned barge within Guy's channel and preserved *in situ* beneath Guy's Hospital (Fig. 3; Site 40/GYH10). The 1st and 2nd century development of the river and channel frontages was most probably associated with the use of the waterways for trade and it is unsurprising that at least one of the buildings has been interpreted as a warehouse (Fig. 3; Site 39/LBI95).

The western frontage of Road 1

- 5.3.16 Development along the western frontage of Road 1 is poorly understood, for the proximity of Southwark Cathedral, Borough Market and the listed status of many of the buildings in the area have resulted in an inevitable lack of archaeological investigation. Nonetheless a number of excavations were conducted before 1990, whilst more recently archaeological excavations have been undertaken at Southwark Cathedral (Fig. 3; Site 18/MTA99; Divers *et al.* 2009) and a number of archaeological watching briefs have been carried out in the general area.
- 5.3.17 Excavations at the northern extent of the western street-side frontage in the Southwark Cathedral area have revealed evidence of 1st century timber buildings (Fig. 3; Site 42/SCC77) and a Roman burnt horizon (Fig. 3; Site 41/GM437), as well as a tessellated pavement recorded in 1833 and painted wall plaster recorded in 1911 (MoLAS 2003a). Nearby in the Montague Close area, archaeological evidence of early Roman quarrying and timber buildings fronting Road 1 have been found (Fig. 3; Site 43/BWMC74; Site 44/MON90). These excavations, and also the recently published excavations at Southwark Cathedral (Fig. 3; Site 18/MTA99; Divers *et al.* 2009), have demonstrated that a second intra-mural road, Road 2, led from the bridgehead in an NE-SW direction (discussed below) and land situated to the south-east of Road 2 may have also fronted onto the western frontage of Road 1.
- 5.3.18 Further to the south, a 1988 excavation at 22 Borough High Street provides a useful indication of development to the west of the road, with evidence for timber buildings recorded at c.2.5m distance from the edge of Road 1 and five phases of timber building recognised. Likewise, the 1985 excavations at 1a Bedale Street/2 Southwark Street (Fig. 3; Site 17/2SSBS85) allude to the nature of western street-side development with two phases of late 1st-2nd century timber building recorded. Timber buildings associated with either the western frontage of Road 1 or the Southwark Street channel have also been recorded during

watching briefs at 52 Borough High Street (Fig. 3; Site 45/BRQ08) and 10-16 Southwark Street (Fig. 3; Site 46/10SS81).

The frontages of Road 2, Bankside channel & Southwark Street channel

- 5.3.19 Archaeological excavations at Montague Close (Fig. 3; Site 43/BWMC74) and Southwark Cathedral (Fig. 3; Site 18/MTA99; Divers *et al.* 2009) found that a second main road, Road 2, led NE/SW from the bridgehead and had been established prior to AD 60, with multiple episodes of subsequent resurfacing in evidence. Amongst the many important sites associated with Road 2 are the remains of a high-status masonry building complex at Winchester Palace, which was located adjacent to the north-east extent of the road and close to the Thames foreshore (Fig. 3; Site 47; Yule 2003).
- 5.3.20 The south-west extent of Road 2 may be implied by the location and alignment of a NNW/SSE aligned side road and timber buildings encountered during excavations at Courage Brewery. A short distance to the north, excavations at 18 Park Street (Fig. 3; Site 48/PRK90) found evidence of mid/late 1st century ditches, including a possible palisade trench, and later 1st and 2nd century timber buildings, whilst at 28 Park Street (Fig. 3; Site 49/PKZ07; Site 50/28PS84) buildings and the remains of a channel-side jetty/landing were found. Further evidence suggestive of the continuation of Road 2 was found during excavations at 51 Southwark Street where timber piles may represent the remains of a bridge crossing Bankside Channel (Bird & Graham 1978, 517-26). Collectively, these excavations suggest a concentration of development close to Road 2 and the frontage to Bankside channel, i.e. adjacent to two potentially important trade and communication routes.
- 5.3.21 Excavations were conducted at 15-23 Southwark Street in 1980 (Fig. 3; Site 16/SKS80) with further investigation conducted in 2005 (Fig. 3; Site 51/RXW05) and demonstrated that the remains of a high-status late 1st-4th century masonry building, built above an earlier burnt timber building, was present. In addition, two phases of late 1st/early 2nd century timber buildings, an early 2nd century masonry building and late 2nd century masonry associated with a tessellated floor was recorded at a nearby site on Redcross Way (Fig. 3; Site 53/RWT93). Additional excavations along Redcross Way (Fig. 3; Site 52/RWG94) recorded evidence of a pre-2nd century building and a late 2nd century hexagonal masonry building, whilst a timber building was recorded at O'Meara Street (Fig. 3; Site 54/OMS94). Evidence of robbed out Roman masonry has also been found at 52-54 Southwark Street (Fig. 3; Site 55/52SOS89) and the remains of a demolished masonry building has been recorded at 51-53 Southwark Street (Fig. 3; Site 56/FSS96; Killock 2005).
- 5.3.22 Some of this evidence may relate to standard buildings fronting the southern edge of Road 2, however there is little doubt that some of the masonry represents part of a high-status building, possibly a mansio, located to the southeast of Road 2, adjacent to the Southwark Street channel and close to the southern extent of Road 1 (Fig. 3; Site 16; Cowan 1992).

5.3.23 With regards to the southern frontage of Road 2, it should not be discounted that evidence of buildings thought to be associated with the western frontage of Road 1 (see above) could also be associated with the southern frontage of Road 2. The 'multiple Roman finds' discovered in Stoney Street during the 19th century (Fig. 3; Site 57/GLSMR090378) seem likely to relate to a building fronting the southern edge of Road 2.

The Late Roman settlement

5.3.24 Following the development, prosperity and stability of the earlier Roman periods, the late Roman period within Southwark, i.e. the late 3rd-early 5th century, is characterised by the fragmentation and contraction of the settlement south towards a religious landscape situated close to the mainland (Fig. 3; Site 58; Killock & Shepherd in prep) and north towards the bridgehead (MoLAS/EH 2000, 147). One possible reason for the contraction of the settlement may be that whilst the north-bank settlement was encircled by a defensive wall and ditch, in contrast Southwark appears to been left largely undefended, which may have required that the focal points of the earlier settlement had to be more contained.

5.3.25 Archaeological evidence suggests that the settlement also contracted towards the main roads, for late Roman dark earth has been recorded on previously developed sites in locations set back from the frontage of Road 1 (Fig. 3; Site 5/LBN08; Site 7/11STS77; Site 43/BWMC74). There is also evidence of late 3rd/4th century robbing of masonry buildings to the east (Fig. 3; Site 2/LBE95) and west of the road (Yule 2005). Late Roman burials cut into the masonry building at 25 London Bridge Street (Fig. 3; Site 5/LBN08) further indicate the retraction of the settlement.

5.3.26 To the south, further evidence of 3rd/4th century robbing of masonry buildings has been found at Kings Head Yard (MoLAS 2003a). Further to the south-west, 3rd century demolition deposits (Fig. 3; Site 53/RWT93), late Roman dark earth horizons (Fig. 3; Site 48/PRK90; Site 50/28PS84; Site 52/RWG94; Site 53/RWT93; Site 59/38BHS79), late Roman masonry robber cuts (Fig. 3; Site 52/RWG94; Site 55/52SOS89) and late Roman burials (Fig. 3; Site 15/REW92; Site 16/SKS80; Site 51/RXW05; Site 52/RWG94) have been recorded within land close to the south-west extent of Road 2. The presence of this type of archaeological evidence suggests that the high-status masonry buildings were no longer in use and that much of the land had reverted to 'open spaces' at the end of the Roman period (MoLAS/EH 2000, 146).

5.4 Saxon (AD 410-1066)

5.4.1 Archaeological evidence for activity dating between the early 5th-mid 9th century is largely absent within Southwark, with the previously settled area seemingly abandoned during this time (MoLAS/EH 2000, 191). However, some structural vestiges of the Roman settlement seem to have remained standing throughout this period, in particular the masonry building at

Winchester Palace (Fig. 3; Site 47; Watson *et al.* 2001, 56; Yule 2005, 78). In addition, there is evidence to suggest that elements of the buildings to the east of Road 1 around London Bridge Street (Fig. 3; Site 5/LBN08; Site 22/LOB98) and St Thomas Street (Fig. 3; Site 24/1STS74) also remained standing throughout this time.

- 5.4.2 The Burghal Hidage (c.AD 911-919) details a burh named ‘Suthringa geweorche’, (variously translated as ‘the southern work’ or ‘the work of the southern people’ or the ‘[defence] of the men of Surrey’), which may refer to Southwark (Sheldon 1978, 48; MoLAS/EH 2000, 191; Watson *et al.* 2001, 53). The location of the Southwark burh is largely hypothesised, however it is probable that the bridgehead area, adjacent to the river frontage and close to Road 1, was reoccupied during the Late Saxon period. The first record of a market in the area dates to 1014 when it is recorded that fish, grain, vegetables and cattle were being sold on the bridge (MoLAS 2003a).
- 5.4.3 It is probable that an attack on London in AD 994 may have initiated a rebuilding of the bridge and, in turn, the fortification of Southwark (Watson *et al.* 2001, 53). These works may have utilised pre-existing Alfredian burghal defences. Southwark’s Late Saxon defences are detailed in Snorre Sturlason’s 13th century description of an 11th century attack on Danish held London Bridge. A translation reads:

‘...They steered first to London, and sailed into the Thames with their fleet; but the Danes had a castle within. On the other side of the river is a great trading place, which is called Sudvirke. There the Danes had raised a great work, dug large ditches, and within had built a bulwark of stone, timber, and turf, where they had stationed a strong army. King Ethelred ordered a great assault; but the Danes defended themselves bravely, and King Ethelred could make nothing of it. Between the castle and Southwark (Sudvirke) there was a bridge, so broad that two wagons could pass each other upon it. On the bridge were raised barricades, both towers and wooden parapets, in the direction of the river, which were nearly breast high; and under the bridge were piles driven into the bottom of the river. Now when the attack was made the troops stood on the bridge everywhere, and defended themselves. King Ethelred was very anxious to get possession of the bridge, and he called together all the chiefs to consult how they should get the bridge broken down...’ (Sturlason c.1225 - Para.11. ‘Death of King Svein Forked Beard’)

The account continues:

‘... The piles were thus shaken in the bottom, and were loosened under the bridge. Now as the armed troops stood thick of men upon the bridge, and there were likewise many heaps of stones and other weapons upon it, and the piles under it being loosened and broken, the bridge gave way; and a great part of the men upon it

fell into the river, and all the ethers fled, some into the castle, some into Southwark. Thereafter Southwark was stormed and taken...' (Sturlason c.1225 - Para.12. 'The Sixth Battle')

- 5.4.4 The location, extent and orientation of these defences has caused much debate in recent years (Dawson 2011; 2012a; 2012b; Watson 2009; 2011/2), with one theory suggesting that the alignment of Montague Close and St Mary Overy Dock could represent the approximate location and orientation of the defences (Watson 2009). The location and alignment of any defensive earthworks on the eastern side of the settlement are also unknown; however, it is possible that St Thomas Street and the historic extent of Joiner Street could reflect their continuation.
- 5.4.5 The evidence of late 9th/early 10th century occupation in Southwark is by no means extensive, however, that which does exist is largely located within the proposed boundaries on the bridgehead settlement as discussed above (Watson *et al.* 2001, 53, 56). Elements of the masonry buildings located at Winchester Palace, London Bridge Street and St Thomas Street seem to have stood throughout the Saxon period and evidence of Late Saxon occupation/exploitation has been recorded around these areas. A Late Saxon pit, bone comb and loom weight were discovered at 8 London Bridge Street (Fig. 3; Site 22/LOB98) and possible Late Saxon gullies, pottery and an Alfredian coin have been recorded along St Thomas Street (Fig. 3; Site 7/11STS77).
- 5.4.6 In addition, Late Saxon robbing of Roman buildings has been recorded at London Bridge Street (Fig. 3; Site 5/LBN08; Site 22/LOB98) and at Winchester Palace (Fig. 3; Site 47; Yule 2005) which may suggest that the building material was being removed for construction elsewhere within the bridgehead settlement. The presence of post-Roman silt horizons, dumps and dark earth deposits elsewhere within the proposed Late Saxon boundaries (Fig. 3; Site 9/22BHS88; Site 33/LBA95; Site 60/20LBS75) suggests that areas of the settlement remained unoccupied open land. Beyond the proposed boundaries of the bridgehead settlement there is a general absence of evidence for Late Saxon activity.

5.5 Medieval (1066-1485)

- 5.5.1 Reference to Southwark in the Domesday Book (1086) suggests it was an un-manorialised settlement without a direct lord. At the beginning of the medieval period the settlement is described as comprising 'several dozen houses, a trading shore, a dock, a fishery and a 'Monesterium', the latter of which is thought to be the site of the Priory of St Mary Overy, present day Southwark Cathedral (MoLAS 2003a).
- 5.5.2 It is possible that the medieval boundaries may be reflected in the modern street pattern, in particular the location and alignment of parts of Montague Close, Bedale Street, St Thomas Street and Joiner Street (see above). An E/W aligned ditch recorded at 1a Bedale Street

(Fig. 3; Site 17/2SSBS85) and a channel recorded at 32 London Bridge Street (Fig. 3; Site 4/LWE07) may represent part of the same medieval earthwork. The location of Winchester Palace (residence of the Bishops of Westminster) immediately to the west of the proposed boundary may suggest that secondary settlement boundaries existed, the location and alignment of which could again be reflected in the modern street pattern, i.e. the parallel 'curves' of Stoney Street and Park Street. With this as a consideration, it may be of interest that medieval channels, some of them revetted, have been recorded at 28 Park Street (Fig. 3; Site 50/28PS84).

- 5.5.3 During the medieval period the development of Southwark was dictated by the important trade routes into London from the south and south-east, with the main medieval settlement inevitably focused around the High Street leading up to the bridgehead (Carlin 1998, 18). Medieval London Bridge was constructed during the 12th century and prior to the construction of Westminster Bridge during the 18th century, the nearest river crossing was located at Kingston. Southwark's many inns benefitted from the numerous passing travellers and traders, and the population developed an eclectic demographic with numerous occupational groups and residents from all over Europe (MoLAS/EH 2000, 212; Carlin 1998, 169-171, 191, 209; Knight 2002, 12).
- 5.5.4 Documentary sources indicate that the 14th century townhouse of Lady Cobham was located at Green Dragon Court (TAA4) which after being bequeathed to the Priory of St Mary Overy in 1370, became an inn known as 'Cobham's Inn' and later as 'Green Dragon Tavern' (MoLAS 2003a). The late medieval 'The Swan Inn' (originally known as 'The Swan with Two Necks') stood just to the north of St Thomas's Hospital, structural evidence of which has been found on excavations to the north of London Bridge Street (Fig. 3; Site 3/LBB95; Site 33/LBA95).
- 5.5.5 Religious institutions played an important role in Southwark's development, being responsible for 'religious activity, promoters of learning and culture, administrators of local charity, purchasers and employers of local goods and landlords to hundreds of local residents' (Carlin 1998, 67). The major religious institutions of medieval Southwark were located within the proposed boundary of the bridgehead settlement and include the Priory of St Mary Overy (Southwark Cathedral) to the west of Borough High Street, with St Olave's church and St Thomas's Hospital to the east.
- 5.5.6 St Thomas's Hospital was originally founded in 1106 on the western side of Borough High Street by the Bishops of Winchester and within the grounds of the Priory of St Mary Overy, however the hospital was relocated to the eastern side of Borough High Street at the beginning of the 13th century (MoLAS 2003a). The stone walls of a cellar/undercroft, a relieving arch and buttresses were recorded at 11-19 St Thomas Street (Fig. 3; Site 7/11STS77) and are thought to represent part of the medieval hospital precinct. Likewise,

13th century pits and part of a medieval building recorded at 4-26 St Thomas Street (Fig. 3; Site 6/4STS82) are also thought to be related to the hospital. A short distance to the north, pits and medieval masonry recorded at 10-18 London Bridge Street (Fig. 3; Site 23/LNB97) and an 'arched foundation' at 20-26 London Bridge Street (Fig. 3; Site 32/LBJ95) may also be associated with the medieval hospital. Further evidence of medieval masonry (Fig. 3; Site 19/STU92; Site 25/TAS08; Site 28/GLSMR090223; Site 34/LBH94) and evidence of occupation (Fig. 3; Site 2/LBE95; Site 5/LBN08; Site 22/LOB98; Site 36/TOM95) have also been found at multiple other locations around the London Bridge Street/St Thomas Street area and once again may also be associated with the hospital precinct. Medieval chalk masonry found at Joiner Street (Fig. 3; Site 37/MSA92) could potentially be associated, or alternatively, may represent part of a building located close to the north-east extent of the bridgehead settlement.

- 5.5.7 It would appear that the settlement extended south of the immediate bridgehead during the later medieval period. To the west of Borough High Street and south of Bedale Street, excavations at 15-23 Southwark Street (Fig. 3; Site 16/SKS80) have produced evidence of medieval pitting. To the east of Borough High Street, south of St Thomas Street, chalk masonry (Fig. 3; Site 31/WHY85), late medieval ditches (Fig. 3; Site 21/BGH95) and evidence of medieval property boundaries (Fig. 3; Site 29/BUG94) have also been recorded, indicating settlement expansion to the south occurred on both sides of the High Street.

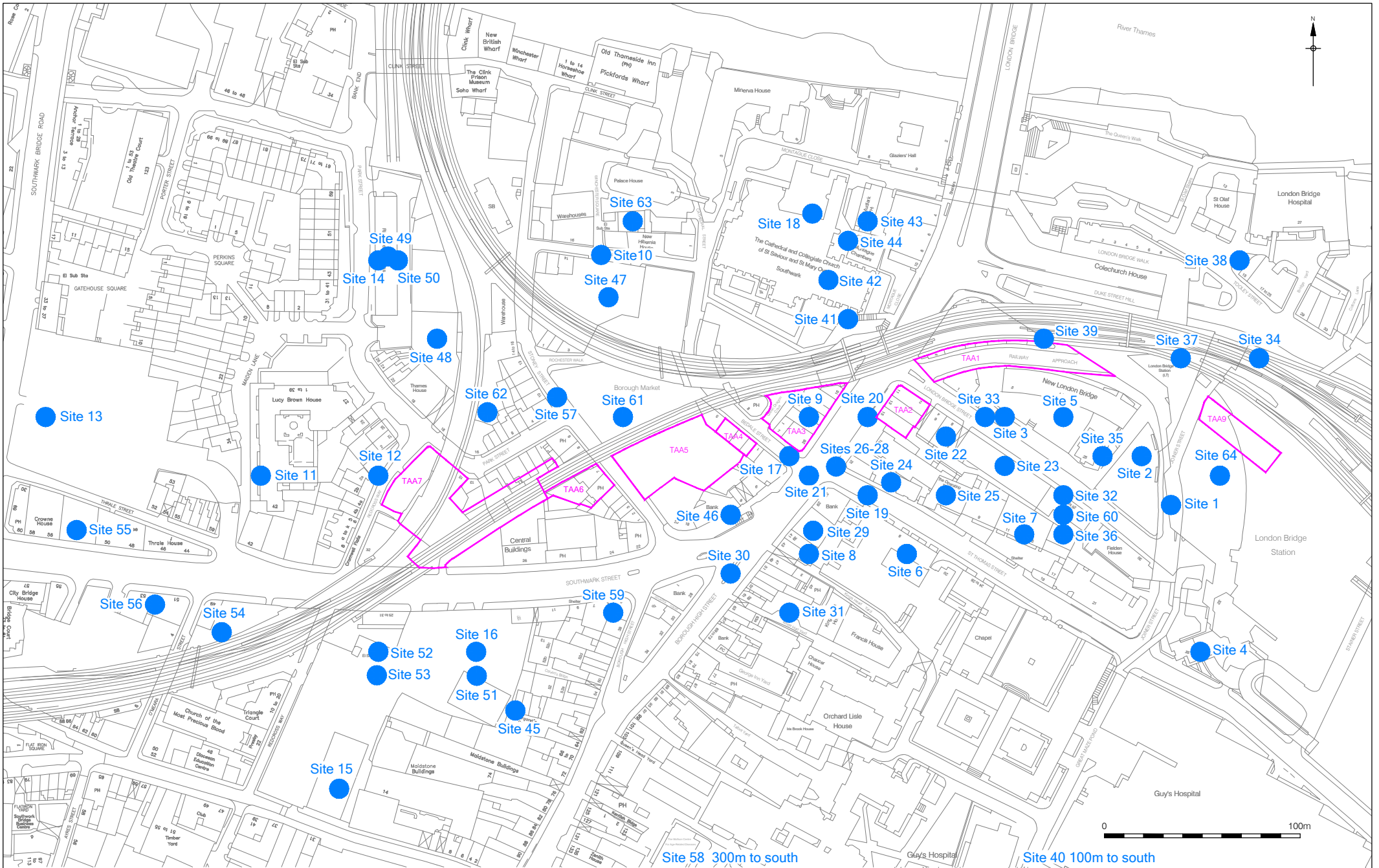
5.6 Post-medieval (1485-20th century)

- 5.6.1 London Bridge remained of economic importance to the development of Southwark during the post-medieval period, with the bridge providing direct access to the important markets of the City of London (MoLAS 2003a). Cartographic sources indicate that tenements lined the eastern frontage of the high street, with St Thomas's Hospital occupying the land immediately to the east. Below ground elements of the post-medieval hospital have been recorded along St Thomas Street at Nos.4-26 (Fig. 3; Site 6/4STS82), Nos.11-19 (Fig. 3; Site 7/11STS77), at St Thomas's Church (Fig. 3; Site 25/TAS08) and also at 8 London Bridge Street (Fig. 3; Site 22/LOB98). A stone well recorded as part of the Jubilee Line Extension excavations (Fig. 3; Site 21/BGH95) may also be associated with the hospital. Evidence of post-medieval buildings elsewhere along London Bridge Street at Nos.20-26 (Fig. 3; Site 32/LBJ95), No.32 (Fig. 3; Site 4/LWE07), No.25 (Fig. 3; Site 5/LBN08) and within watching brief trenches (Fig. 3; Site 21/BGH95; Site 27/BSE94) may be associated with the post-medieval hospital or perhaps nearby buildings of contemporary date. In situ human burials at 25 London Bridge Street (Fig. 3; Site 35/NLB91), 20-26 London Bridge Street (Fig. 3; Site 39/LBI95) and London Bridge Station (Fig. 3; Site 1/LBD95) probably form part of St Thomas's Hospital burial ground/the Flemish churchyard of St Olaves (NWR 2009a).

- 5.6.2 To the west of the high street, elements of late 15th-early 19th century buildings have been recorded during investigations at Bedale Street (Fig. 3; Site 17/2SSBS85), Borough Market (Fig. 3; Site 61/BKT01), Stoney Street (Fig. 3; Site 62/MKY08) and Borough High Street (Fig. 3; Site 45/BRQ08). Of specific relevance to Green Dragon Court (TAA3) is a 1560 lease for the 'Green Dragon Tavern' (see above), which was granted to the wardens of St Saviour's Church with St Saviour's Grammar School opened in 1562 (MoLAS 2003a).
- 5.6.3 The accessibility of the city, yet Southwark's geographical separation from it, encouraged the growth of industrial trades, with the area increasingly exploited for industrial uses. Land to the west of the High Street seems to have been particularly well utilised, with Delftware kilns recorded at Southwark Cathedral (Fig. 3; Site 18/MTA99; Site 41/GM437; Divers *et al.* 2009), which are possibly associated with sizable quantities of delft pottery found at Montague Close (Fig. 3; Site 43/BWMC74; Site 44/MON90). Evidence for glass making and molasses refining has also been recorded around Winchester Walk (Fig. 3; Site 10/BYI03; Site 63/WIE02), whilst further to the south a clay pipe kiln has been recorded at 15-23 Southwark Street (Fig. 3; Site 16/SKS80).
- 5.6.4 On May 26th 1676 c.500 of Southwark's dwellings and inns were destroyed when a fire started in an oil shop on the high street. An article of the time described the aftermath of the fire as:
- 'Three Crown Court (relates to TAA5) is rubbish and ashes, the Meal Market standing in the middle of the street is consumed, and no sign is left to know where it stood. ...Fronting south to the east and west the church was enveloped in flames. All Foul Lane (relates to TAA3 & TAA4), the churchyard buildings, several alleys, one side of the street over to St Mary Overies Dock are gone. Twenty or more people are killed and many wounded'* (cited in MoLAS 2003a)
- 5.6.5 An Act of 1754 identified the High Street market as a serious obstruction to trade and commerce and from 25th March 1756 the street market was banned. At the same time, commissioners were appointed to acquire land within which to set out a new market, this being a block of land called 'Rochester Yard' (TAA5) which was described as:
- 'A convenient place in a spot called the Triangle, abutting on a place called the Turnstile, on the backside of Three Crowns Square, on Fowle Lane, on buildings in Rochester Yard and Dirty Lane, and towards Deadman's Place'* (cited in MoLAS 2003a)
- 5.6.6 The trade in hops bought in from Kent inevitably led to Southwark being heavily involved in the brewing industry (MoLAS 2003a), with much of the produce presumably sold in the many inns which lined the high street, side streets and streets surrounding the new market. Two hop merchants are listed on Stoney Street during the 18th century and two public houses, the

'Harrow' on 'Harrow Corner' and a public house at 6 Stoney Street, which may have been connected via an alley named the 'Whores Nest', were licensed during this period. The alley is no longer present in the modern street plan and the two public houses are now respectively known as 'The Market Porter' and 'The Wheatsheaf' (TAA6).

- 5.6.7 In 1584 the Abbot of Waverley's town house was acquired by Thomas Cure, saddler to the queen, who constructed almshouses for 16 poor parishioners (Malden 1912). A burial ground was subsequently established in the late 18th century and during the early 19th century were known as 'St Saviours Almshouse' and 'St Saviours-Almshouse-Burial Ground' (MoLAS 2003a; TAA7).
- 5.6.8 The 19th century brought significant changes to Southwark, with London Bridge rebuilt in the early 19th century and Borough High Street widened and realigned at a contemporary date. Large parts of St Thomas's Hospital were also demolished and only the southern buildings/wing were retained, with new tenement buildings fronting onto the realigned high street and side streets built in other parts of the former hospital precinct.
- 5.6.9 During the mid 19th century, large tracts of land were compulsorily purchased throughout Southwark for the construction of the South Eastern Railway, London Bridge-Cannon Street/London Bridge-Charing Cross line (MoLAS 2003a). Further alteration of the street pattern was undertaken to the east of Borough High Street, whilst to the west a new thoroughfare, Southwark Street, was established in 1864. The Hop Exchange, the commercial centre of the English hop trade, was built on the northern side of Southwark Street in 1866 (MoLAS 2003a).
- 5.6.10 Post-medieval masonry recorded at Joiner Street (Fig. 3; Site 37/MSA92) and around London Bridge Station (Fig. 3; Site 1/LBD95; Site 2/LBE95, Site 64/JNE99; Site 35/NLB91), as well as that recorded during recent Thameslink excavations around London Bridge Station (BVC12; BVM12) represent the remains of post-medieval buildings which were compulsorily purchased and demolished prior to the construction of the new railways. Further evidence of 19th century railway construction has been recorded elsewhere along the length of Borough Viaduct.



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JB 29/01/13

Figure 3
 Sites mentioned in the text
 1:2,500 at A4

6 ARCHAEOLOGICAL METHODOLOGY

6.1 Introduction

- 6.1.1 Archaeological investigations were intermittently conducted at Vaults 2, 5 & 9, Railway Approach between August 2010 and February 2011. Within Vaults 2 and 5, the archaeological work comprised pre-start watching briefs followed by archaeological excavation of four c 2.50m² trenches (Vault 2 North, Vault 2 South, Vault 5 North and Vault 5 South). In addition, a watching brief was undertaken during the drilling for piles in Vault 9, specifically to monitor the occurrence of human remains.
- 6.1.2 The OA-PCA archaeological site work at Railway Approach was supervised by Audrey Charvet and Amelia Fairman, under the project supervision of Joanna Taylor and the project management of Peter Moore and Dan Poore. Chris Place (Network Rail Project Archaeologist) acted as archaeological advisor to Network Rail and the progress of the archaeological investigations were monitored by Dr Chris Constable (Senior Archaeology Officer, Southwark Council).
- 6.1.3 Archaeological recording was undertaken using the single context recording system as specified in the Museum of London Site Manual (MoL 1994) and Pre-Construct Archaeology's Operation Manual I (Taylor & Brown 2009). Plans were drawn at a scale of 1:20 and full or representative sections at a scale of 1:10. Contexts were numbered sequentially and recorded on *pro-forma* context sheets. A full photographic record was maintained throughout the entirety of the archaeological work.
- 6.1.4 The completed archive comprising artefactual material and written, drawn and photographic records for site code BVL10 will be deposited at the 'London Archaeological Archive and Research Centre' (LAARC) where it will be accessible for public consultation.

6.2 Pre-Start & Temporary Works Installation Watching Briefs (Vault 2 & Vault 5)

- 6.2.1 Pre-start watching briefs were conducted on the removal of low-grade deposits until the uppermost archaeological horizon was reached. Watching briefs were also conducted during the installation and modification of temporary works.
- 6.2.2 The methodologies utilised during these watching briefs are detailed below:
- The contractor's engineer mapped out each trench location and once all approved permits, task briefs, risk assessments and emergency plans were in place, work commenced. The contractor's engineer/temporary works department provided OA-PCA with details of the agreed shoring methodology to be employed in each trench and any pre-defined 'shoring levels', 'formation depths' and 'project depths' were established prior to work commencing.

- An archaeologist assessed the provisional breaking-out of the concrete floor slab under watching brief conditions to establish whether archaeological deposits were present immediately beneath. After its removal, 'soft' low-grade deposits were then removed by the contractor under the observation of an attendant archaeologist. Soft deposits were removed in horizontal 'spits' measuring between 100mm and 200mm in thickness using a mechanical excavator fitted with a toothless ditching bucket.
- The attendant archaeologist/s observed the removal of 'soft' low-grade deposits until the uppermost archaeological horizon was reached or the first pre-determined 'shoring level' was attained. Any 'hard' deposits, e.g. masonry or concrete, were temporarily left in situ until each shoring level was attained. The contractor was responsible for the removal of all spoil from the trench.
- If no archaeological deposits were encountered prior to the first shoring level, the attendant archaeologist recorded and photographed the trench prior to the installation of temporary works. Once the recording was completed, the trench was handed back to the contractor and the installation of the first set of shoring was undertaken. At this time, scaffold barriers were installed, fixed ladder access/egress was provided and a spoil removal system was established. Once the first set of shoring had been installed and provision for new trench conditions had been made the contractor's engineer/temporary works department inspected the shoring and signed it off as safe.
- Thereafter, the removal of low grade deposits under watching brief conditions recommenced and continued until the upper archaeological horizon or the next shoring level was reached.

6.3 Archaeological Excavation to Project Level (Vault 2 & Vault 5)

6.3.1 The BVL10 archaeological excavations consisted of four trenches, Vault 2 North, Vault 2 South, Vault 5 North and Vault 5 South, which were positioned above pile locations associated with the construction of Thameslink Borough Viaduct. The trenches measured between 2.5m and 4m in depth and archaeological excavation was undertaken in c.0.40-0.55m blocks to enable the temporary works to be safely installed as the excavation progressed.

Trench	Ground Level (following removal of concrete floor slabs)	Depth
Vault 2 North	2.80m OD	0.27m OD
Vault 2 South	1.77m OD	0.07m OD - 0.50m OD
Vault 5 North	3.78m OD	0.25m OD - 0.70m OD
Vault 5 South	2.12m OD	0.00m OD - 0.65m OD

6.3.2 The methodologies utilised during the archaeological excavation of the trenches is detailed below:

- The likelihood of encountering archaeological deposits increased as greater depths were reached within the trench and when the uppermost horizon was encountered the attendant archaeologist advised that excavation of the trench should transfer to OA-PCA. A team of CSCS qualified archaeologists commensurate to the size of the trench were provided and this team then undertook archaeological excavation to each of the applicable shoring depths until the eventual completion of the trench. The OA-PCA team was led by an SSSTS qualified supervisor who ensured that all archaeological staff were adhering to site H&S as defined by both the contractor and OA-PCA.
- During the course of the archaeological excavation the contractor, the archaeological supervisor and the archaeological team ensured that the integrity of the shored trench was not compromised, e.g. no weight was placed on the walling, no excavation was undertaken directly beneath the timber shoring and excavation did not exceed the specified shoring depth.
- When shoring depth has been reached the trench was handed back to the contractor for the next set of shoring to be installed. Once the contractor's engineer/temporary works department had inspected the shoring and signed it off as safe, the trench specific task brief was updated and staff were briefed on any alterations to working conditions. This methodology continued until a depth that natural deposits were reached.

6.4 Archaeological Watching on Structural Piling (Vault 9)

6.4.1 The construction of the new viaduct also required the installation of six piles within the boundaries of Vault 9, however the proximity of the London Underground in this part of the site ensured that it was not possible to archaeologically excavate the pile locations. Instead, an archaeological watching brief was conducted during the drilling of the pile locations, which specifically aimed to monitor the occurrence of human remains.

7 THE ARCHAEOLOGICAL SEQUENCE

7.1 Introduction

7.1.1 The deposits and structures encountered during the investigations have been ascribed to broad phases, and the results are presented below in chronological order. Five broad phases of archaeological activity were defined across the site. The phasing is provisional and site-specific. It may be refined in the light of evidence produced from detailed analysis of the dataset

- Phase 1 Natural Drift Geology
- Phase 2 Early Roman
- Phase 3 Roman
- Phase 4 Post-Roman
- Phase 5 Post-medieval

7.1.2 It should be noted that some slight modifications to the provisional phasing of the site have already been identified; these have been incorporated in the present stratigraphic narrative, but not in the specialist reports, which retain the original phasing, although this is not thought to significantly compromise the value of the finds and environmental assessments. The modifications relate to the way in which the phases have been subdivided, rather than their overall numbering. The earlier phases (up to and including 3a and most of 3b and 3c) are unchanged. Phase 3/4 as originally defined (and used in some of the specialist assessment reports) has become Phase 3d here and an additional Roman sub-phase (Phase 3e) added, incorporating some contexts originally assigned to Phase 4. Contexts described below under Phase 4 are now entirely post-Roman in date and also include most of those originally assigned to Phase 4/5.

7.2 Phase 1

Vault 2 North, Vault 2 South, Vault 5 North & Vault 5 South

7.2.1 Naturally deposited sandy gravel was exposed throughout the entirety of all four trenches [162], [337], [342], [517] and [623]. The natural deposits were generally mid yellow to orange gravels/sandy gravels and these deposits were encountered between 0.09m and 0.70m OD.

7.3 Phase 2a

Vault 2 North

7.3.1 Two irregularly shaped cut features, [519] and [521], recorded in Vault 2 North have been attributed to Phase 2a and may represent the remains of possible pits or undulations in the natural gravels (Fig. 3). The cut features measured 0.35m in depth, between 1.00m and

1.25m in plan and both extended beyond the limit of excavation. Dark brown, silty clay fills [518] and [520] were respectively contained within the cut features and the presence of blue/grey/orange sand lenses within the fills potentially forms part of a natural depositional sequence. No finds were recovered from either feature.

Vault 2 South & Vault 5 North

- 7.3.2 No Phase 2a deposits or cut features have been attributed to Phase 2a within Vault 2 South & Vault 5 North.

Vault 5 South

- 7.3.3 Truncating the natural horizon in Vault 5 South was a possible NW/SE orientated ditch [341], which measured 0.16m in depth, 0.4m in length and extended north-west beyond the limit of excavation (Fig. 3; Plate 2). The ditch had been heavily truncated by later activity within the trench and it is presumed that it was once significantly deeper and more expansive. The ditch contained a single fill [340], which yielded one sherd of pottery dated to AD 50-150.

- 7.3.4 Also recorded within Vault 5 South during Phase 2a was pit [339] (Fig. 3), which measured c.0.5m in diameter and contained fill [338]. The pit was located less than 1m to the west of the Phase 2a ditch and although no dating evidence was retrieved, stratigraphic relationships imply that the two are likely to be of similar date.

7.4 Phase 2b

Vault 2 North

- 7.4.1 The earlier deposits in Vault 2 North were overlain by a 0.11m thick, mottled peaty sandy silt layer [516], which was in turn overlain by a 0.26m thick, humic silty clay layer [515] which contained animal bone, a fragment of human bone, shell and frequent wood fragments (Fig. 8). Pottery dated between AD 50 and AD 110 was also retrieved from the layer.

Vault 2 South

- 7.4.2 In Vault 2 South, the natural horizon was post-dated by a 0.32m thick, dark black organic layer [611], which was in turn overlain by an alluvial layer [612] (Fig. 8). Organic silty clay layers [620] and [621] were also recorded within the trench. Pottery and other cultural material finds were retrieved from the layers and it is probable that they represent natural accumulations containing rubbish material discarded during their deposition. The horizon was post-dated by a patch of pale grey silty clay with frequent mortar inclusions [619], which was in turn overlain by a thin layer of concentrated wood debris [615]. Pottery dated to c.AD 50-70 was retrieved from the latter deposit.

- 7.4.3 The earlier Phase 2b horizon in Vault 2 South were truncated by an irregularly shaped pit [614], which was located in the north-east part of the trench and extended beyond the limits of excavation (Fig. 4). The pit contained a structural timber [618] (Plate 3) and two organic fills [617] and [613], which both contained small wood fragments. Pottery dated between AD 43 and AD 110 was retrieved from both fills.

Vault 5 North

- 7.4.4 A possible Phase 2b alluvial deposit, [161], composed of sterile, dark bluish grey clay with occasional mottling was encountered within Vault 5 North (Fig. 9). The truncated layer was 0.45m thick at its deepest point and extended across the north-eastern part of the trench.

Vault 5 South

- 7.4.5 No deposits or cut features were attributed to Phase 2b within Vault 2 South.

7.5 Phase 3a

Vault 2 North

- 7.5.1 No deposits or cut features were attributed to Phase 3a within Vault 2 North.

Vault 2 South

- 7.5.2 Truncating the earlier deposits in Vault 2 South were two sub-square pits [607] and [610] which contained fills [606] and [609] respectively (Fig. 4). A small assemblage of pottery dated between AD 50 and AD 160 was retrieved from the former pit fill, whilst digested eel bones, indicative of cess, was retrieved from the latter.

Vault 5 North & Vault 5 South

- 7.5.3 No deposits or cut features were attributed to Phase 2b within Vault 5 North and Vault 5 South.

7.6 Phase 3b

Vault 2 North

- 7.6.1 A 0.02m thick, pale humic silty clay layer [514] was attributed to Phase 3b in Vault 2 North. The layer contained pottery, CBM, shell, a fragment of copper wire (SF 20) and wood fragments (Plate 5), with the ceramic assemblage dated to AD 50-250. The early Phase 3b horizon was overlain by alluvial layers [513], [509], [508] and [510], the depositional nature of which is indicative of a variable fluvial environment (Fig. 8). Pottery dated to AD 70-110 and

fish bones were recovered from environmental samples which suggest that at least some of the material in these layers may have been dumped or discarded.

Vault 2 South

- 7.6.2 A layer of brown sandy silt [605] which contained a varied assemblage of domestic debris, including pottery dated to AD 70-110, overlay the natural deposits in Vault 2 South and represents the earliest surviving activity in this trench.

Vault 5 North

- 7.6.3 A Phase 3b burnt deposit [160] was recorded in the north-east part of the trench and may represent an episode of *in situ* burning or dumping (Fig. 9). The burning was overlain by a clay and gravel levelling layer [158], which was in turn overlain by a 0.30m thick dump layer [155]. Pottery dated to AD 50-110 was retrieved from the upper deposit.

Vault 5 South

- 7.6.4 A layer of dumped alluvium [335], containing pottery dated to AD 120-150, was recorded in Vault 5 South during Phase 3c and was overlain by a mortar layer [334] which may represent the remains of a Phase 3c surface or bedding layer (Fig. 9; Plate 4). The possible surface/bedding layer was post-dated by a grey clay dump [328], a mortar rich silty sand dump [327], and a greenish grey sandy silt dump [332].

7.7 Phase 3c

Vault 2 North

- 7.7.1 A small rubbish pit [512], which extended beyond the limit of excavation, was attributed to Phase 3c (Fig. 4). The pit contained a single, slightly humic mottled fill [511], which contained frequent oyster shell fragments and a small assemblage of pottery dated to AD 50-110.

Vault 2 South

- 7.7.2 No deposits or cut features were attributed to Phase 3c within Vault 2 South.

Vault 5 North

- 7.7.3 In Vault 5 North, the earlier horizons were truncated by a ditch [154] measuring 1.8m in length, 0.6m in width and 0.25m in depth (Fig. 5). The ditch had a shallow profile and contained two fills [153] and [159], the former of which contained a substantial number of pottery sherds dating to AD 70-160. A small posthole [157], containing fill [156] and

measuring 0.15m in diameter and 0.3m in depth, was located to the immediate north-east of the ditch.

Vault 5 South

- 7.7.4 Within Vault 5 South was the north-west part of a large pit [331] which extended across most of the trench and beyond the limits of excavation (Fig. 5). The vertical sided feature measured 1.88m in depth (Plates 6 & 7) and contained five sequential fills, all of which consistently produced pottery dated to AD 120-170. The primary fill [344] contained little significant cultural material, however the secondary fill [343] contained a sizable amount of marine shell that probably represents edible food waste. The tertiary fill [336] was more sterile, although it did produce fragments of two Roman glass bowls and may have been used to seal the decaying deposit below, whilst the fourth fill [333] was rich in pottery, charcoal, oyster shell, occasional fish bones, glass, and a number of metal finds including a single copper alloy coin (SF 14). The uppermost fill [330] was more characteristic of a gradual accumulation with domestic debris incorporated within it. Overall the pit fills (Fig. 9) produced a large quantity of building materials: some 40kg of ceramic building material, plus building stone, tesserae, opus signinum and painted plaster.

7.8 Phase 3d:

Vault 2 North

- 7.8.1 No deposits or cut features were attributed to Phase 3d within Vault 2 North.

Vault 2 South

- 7.8.2 Dump layer [604] overlay the Phase 3c horizon in Vault 2 South and significant quantities of Roman pottery dating to AD 240-400 were retrieved from the deposit. A coin (SF30) and a copper alloy openwork mount (SF32) were also found within the deposit. The mount is thought to be part of a cross-staff head, consisting of a circular double-shell head and a rectangular socket for fixing. Further consideration of the layer will be required prior to publication for whilst mounts are known to date to the Roman period, stylistically this object seems to date to the 11th-12th centuries which would suggest that it is an intrusive object or that the layer is incorrectly phased at present. The dump layer was in turn overlain by a gravel layer [603] which may represent a surface. A small assemblage of finds were retrieved from the deposit and were dated to AD 120-200.

Vault 5 North

- 7.8.3 The Phase 3d depositional sequence in Vault 5 North comprised dump layers [151], [152], [150], [145], [140], [146], [139] and [131] (Fig. 9). The layers varied in hue and thickness but had broadly similar textures and inclusions, which included; mortar chunks, charcoal flecks,

plaster fragments, CBM, pottery, animal bone, oyster shell, and other material in lower frequencies. A single, as yet unidentified, copper alloy coin of Roman date was found within one of the layers (SF2). Collectively the layers were probably dumps of debris and waste from occupation, construction and demolition activities, however a higher proportion of gravel in some of the layers may suggest that at least some of these deposits served as rough surfaces or working horizons.

Vault 5 South

- 7.8.4 In Vault 5 South the Phase 3d sequence comprised sequences of dump layers [329], [326], [325], [324], [323], [322], [321], [313] and [320], [319], [312] (Fig. 9). Again, although the textures and hues varied, there was a general consistency in the mixed nature of the layers and the range of finds. Several of the layers contained substantial pottery assemblages and generally the layers tipped downwards slightly from north to south, probably as a consequence of the large pit below (see Phase 3b). Interestingly two possible mud bricks were recorded within one of the layers whilst another exhibited evidence of being burnt and it is probable that at least some of the dumped layers represented demolition debris. A number of small finds were also retrieved from this group of Phase 3d dump layers and included a bone needle (SF11), a possible needle or hairpin (SF12), a copper alloy hairpin (SF19), an openwork fitting or object (SF17), and a fragment of strap/fitting (SF18).

7.9 Phase 3e

Vault 2 North

- 7.9.1 No deposits or cut features were attributed to Phase 3e within Vault 2 North.

Vault 2 South

- 7.9.2 An east-west orientated linear feature [602], possibly a robber cut or ditch, truncated the earlier horizon in Vault 2 South (Fig. 6). The linear feature measured 0.78m in width, 0.20m in depth and contained fills [601] and [608]. An assemblage of roughly worked stone and a finds assemblage dated to AD 150-250 were retrieved from the fills.

Vault 5 North

- 7.9.3 No deposits or cut features were attributed to Phase 3e within Vault 5 North.

Vault 5 South

- 7.9.4 The Phase 3d horizon in the south-west corner of Vault 5 South was truncated by an east-west aligned linear feature [311] which contained fill [310] (Fig. 6). Pottery dated to AD 120-200 was retrieved from the fill, however it is probable that this material is residual. A shallow

Phase 3e pit [316] was located in the opposite, e.g. north-east, corner of the trench and contained a fill [315] from which pottery dated AD 120-160 was retrieved, again an assemblage probably representative of residual material.

7.10 Phase 4

Vault 2 North

7.10.1 The only evidence attributed to Phase 4 within Vault 2 North comprised a number of post-Roman dump layers/reworked layers [502] and [507] (Fig. 8) which contained residual Roman material and could be either Saxon, medieval or post-medieval in date.

Vault 2 South

7.10.2 No deposits or cut features were attributed to Phase 4 within Vault 2 South.

Vault 5 North

7.10.3 In Vault 5 North there was tentative evidence of activity spanning the end of the Roman period through to the medieval period. Cut feature [130] was partially visible within the trench and although it was impossible to fully determine its nature, at 0.77m deep it may have been a pit rather than a construction cut (Fig. 7). The feature was located on the northern side of the trench and continued beyond its limit of excavation. The possible pit contained three fills [129], [138] and [144], from which building material debris, i.e. CBM, mortar, charcoal flecks etc, were retrieved. A sherd of post-medieval pottery was also attributed to the pit fills, however it seems likely that this is an intrusive item.

7.10.4 The possible pit was subsequently truncated by pit [134], which measured 0.84m in depth and contained a single fill [135] from which a range of finds, including bone, shell and CBM, were retrieved. Two sherds of Roman pottery retrieved from the layer were probably residual.

7.10.5 A second pit [132]/[141]/[149] also truncated the earlier Phase 4 cut feature (Fig. 7). The pit measured over 1.00m in depth and contained five fills [148], [147], [142], [143] and [133]. The fills appeared consistent with general rubbish disposal incorporating food waste, occupation debris and building waste. Three residual sherds of Roman pottery were retrieved from the lower pit fills, whilst three sherds of pottery dating to 1480-1610 were retrieved from the uppermost fill, the later material suggesting that the upper part of the pit might have been infilling in the early post-medieval period.

Vault 5 South

7.10.6 The only evidence attributed to Phase 4 within Vault 5 South comprised a number of post-Roman dump layers/reworked layers [308], [306], [305] and [307] which contained residual Roman material and could be either Saxon, medieval or post-medieval in date.

7.11 Phase 5a

Vault 2 North & Vault 2 South

7.11.1 No deposits or cut features were attributed to Phase 5a within Vault 2 North and Vault 2 South.

Vault 5 North

7.11.2 The earliest post-medieval feature in Vault 5 North was 0.74m deep cut feature [114], possibly a construction cut, which was located in the north-west part of the trench. The possible construction cut contained fill [119], within which frequent brick, tile, mortar and chalk fragments were present. A thin layer of compact mortar [118], probably a surface had been deposited above, which had in turn been overlain by demolition layer [113]. Glass bottle fragments and pottery dated between c.1820-1830 was retrieved from the demolition material.

7.11.3 Further to the south, a brick floor [117], contained within construction cut [112] and associated with backfill [120], was present. The floor measured 1.6m by 0.84m and had been constructed from half bricks (Fig. 7; Plate 8), suggesting either that the floor was laid utilising whatever materials were present or that it was in use for an extended period of time and showed wear and replacements. The bricks themselves were dark red and unfroged, which are more common pre-1840, and they were set in sand. Overlying the floor was a thin occupation layer [116] which was in turn overlain by a 0.56m thick dump layer [115], from which clay pipe and glass bottle fragments dated to the 18th-19th centuries was retrieved.

7.11.4 The dump horizon was in turn truncated by a NW-SE orientated brick culvert [126], within construction cut [128] (Fig. 7) and associated with backfill [127], which extended across the south-west part of the trench (Plate 9). The culvert measured 1.85m in depth and had been excavated down to the level of the natural gravels, severely truncating the earlier archaeological deposits within the majority of the trench. The culvert was constructed of unfroged red bricks laid in a stretcher bond and was mortared with a soft, buff coloured lime mortar. The construction cut also contained backfill [125] and was post-dated by layer [109], both of which produced residual Roman pottery and post-medieval pottery. The collective dating evidence suggests that the culvert was probably constructed around 1840, e.g. prior to the construction of the railway viaduct.

Vault 5 South

7.11.5 No deposits or cut features were attributed to Phase 5a within Vault 5 South.

7.12 Phase 5b

Vault 2 North

7.12.1 A rectangular orange/red brick soakaway/cesspit [503] contained within construction cut [504] had been constructed within Vault 2 North during Phase 5b. The soakaway/cesspit measured over 0.85m in depth and was contained within construction cut [505]. The backfill of the construction cut yielded clay pipe dated to 1680-1710, whilst the infill [506] of the soakaway/cesspit produced a moderate amount of CBM, animal bone, charcoal, pottery and a fragment of a 19th century iron furniture mount.

7.12.2 A NW-SE aligned brick wall [500] contained within construction cut [501] was located to the north-east of the soakaway/cesspit and may have been contemporary. The wall extended across the south-east of the trench and had been constructed from purple/dark red unfrosted bricks, most of which were half bats, bonded with a pale lime rich mortar. The wall measured 0.72m in width and probably formed part of a building, rather than an ornamental garden or dividing wall.

Vault 2 South

7.12.3 In Vault 2 South the only Phase 5b archaeological deposit was a 0.94m thick, made ground layer [600] which extended across the entire trench.

Vault 5 North

7.12.4 During Phase 5b the earlier horizon in Vault 5 North was truncated by pit [110], which contained fill [111] and was overlain by dump layer [108]. The dump layer had in turn had been truncated by pit [106], containing fills [101], [102], [103], [104], [105] and [107], which in turn was post-dated by pit [124], which contained fill [123]. A copper alloy furniture handle (SF1) was retrieved from one of the fills and all three features seem of probable late 19th century date.

Vault 5 South

7.12.5 Phase 5b pits [302] and [304], containing fills [301] and [303] respectively, were recorded in Vault 5 South. Both pits contained single fills dated through to the 19th century. The two features were sealed by made ground layer [309].

7.13 Modern

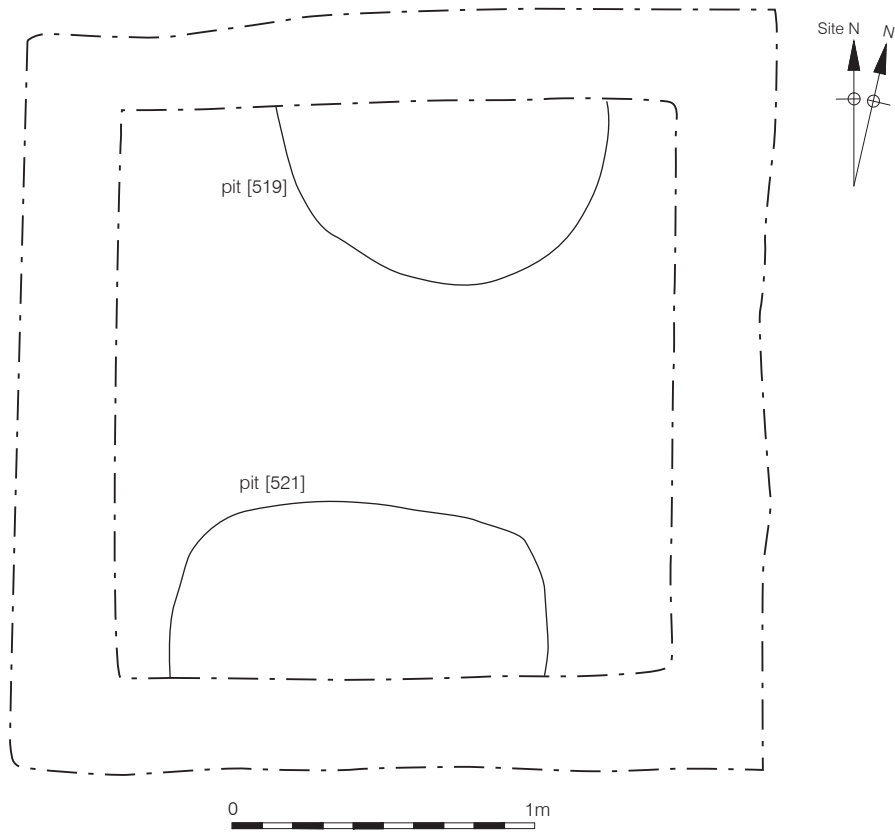
Vault 2 North, Vault 2 South, Vault 5 North & Vault 5 South

7.13.1 Modern brick and concrete slabs of varying thickness constituted the upper deposits in all four trenches and were associated with the construction and use of Vaults 2 and 5 during the modern era. Levels for the upper height of the Concrete slabs do not exist as these were removed prior to the commencement of archaeological excavation.

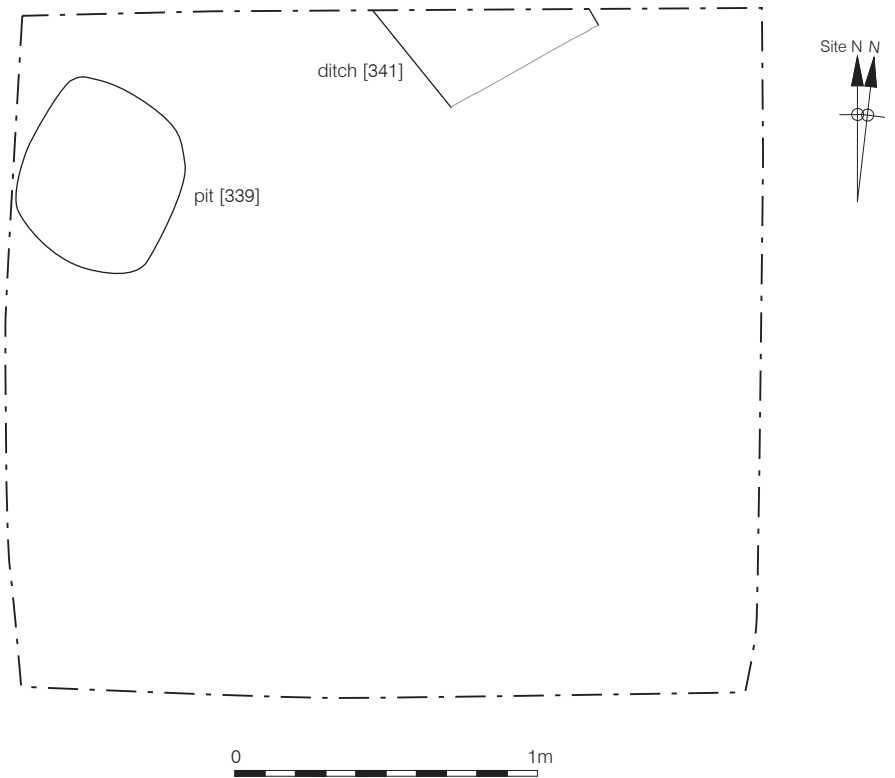
7.14 Watching Brief of Vault 9

7.14.1 A watching brief was maintained in Vault 9 during drilling for six individual pile positions. Close observation was not possible, but material in the arisings was monitored and fragmentary human remains from the 19th century and earlier churchyard of St Olave's were recovered. These were bagged as charnel in accordance with an agreed procedure and have been reburied at Kemnal Park Cemetery, Sidcup.

Vault 2 North Phase 2a



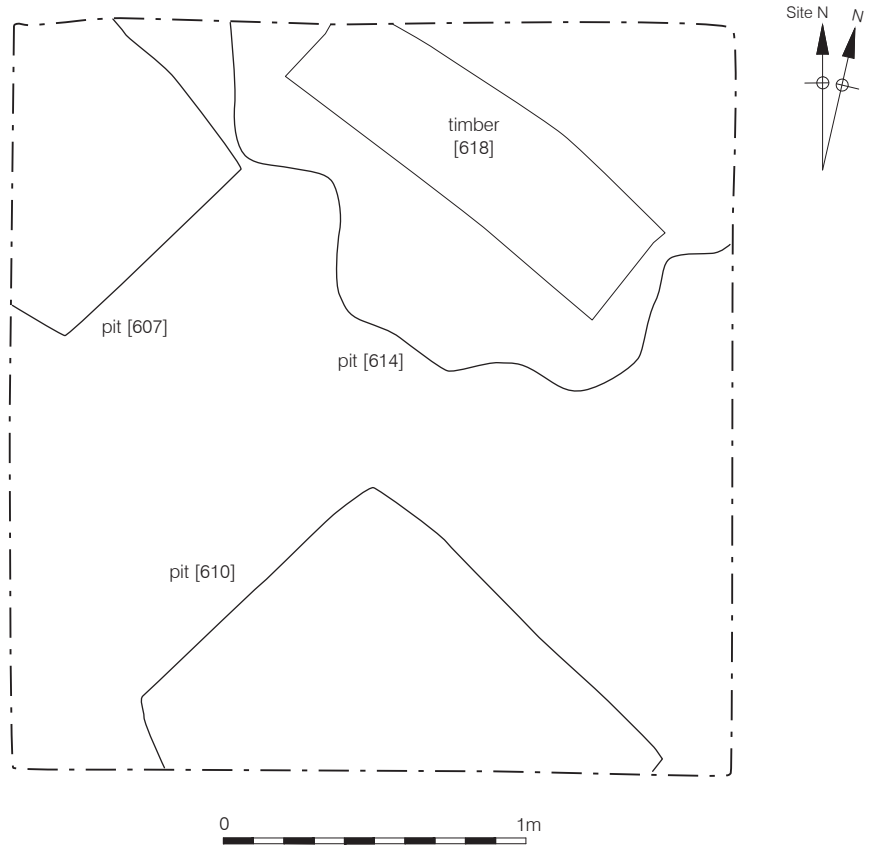
Vault 5 South Phase 2a



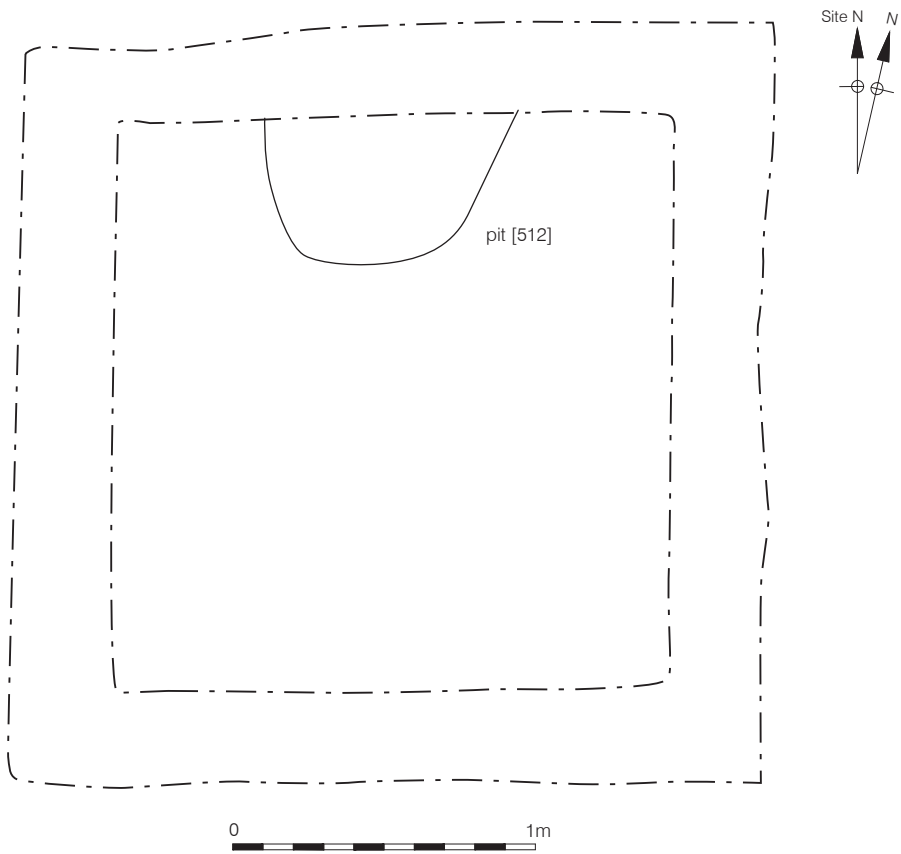
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Figure 4
Vault 2 North Phase 2a; Vault 5 South Phase 2a
1:25 at A4

Vault 2 South Phases 2b and 3a



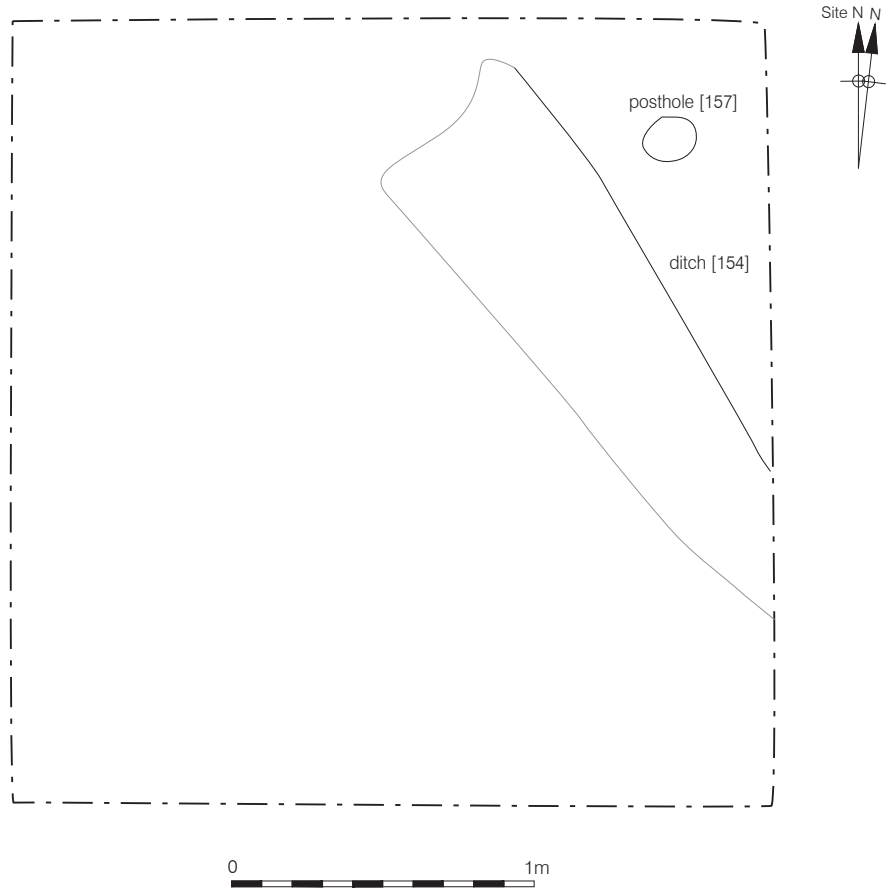
Vault 2 North Phase 3c



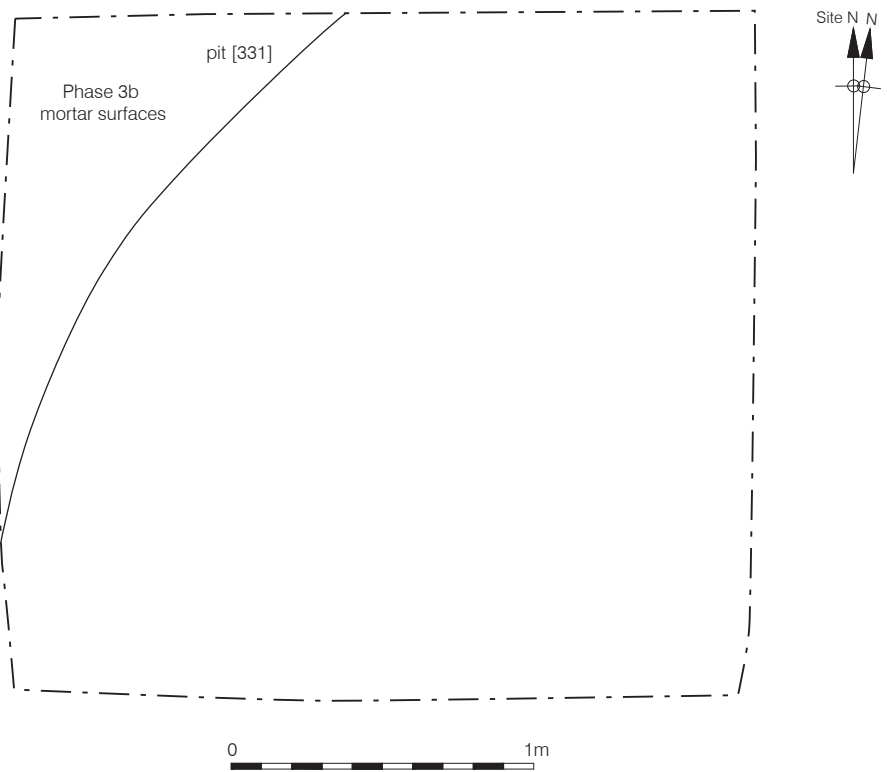
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Figure 5
Vault 2 South Phases 2b and 3a; Vault 2 North Phase 3c
1:25 at A4

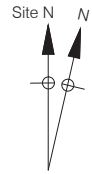
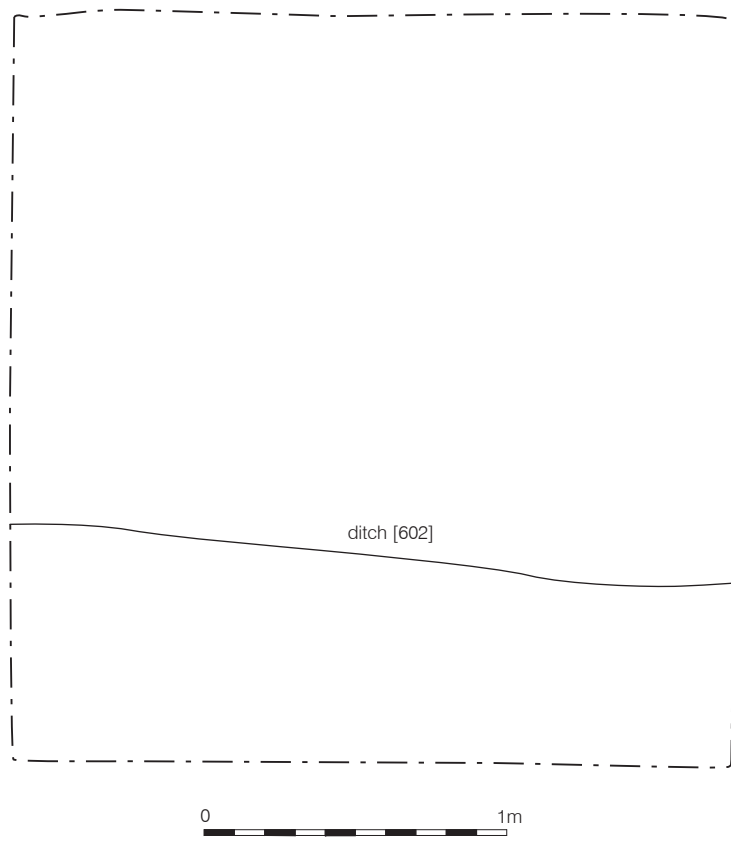
Vault 5 North Phase 3c



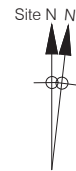
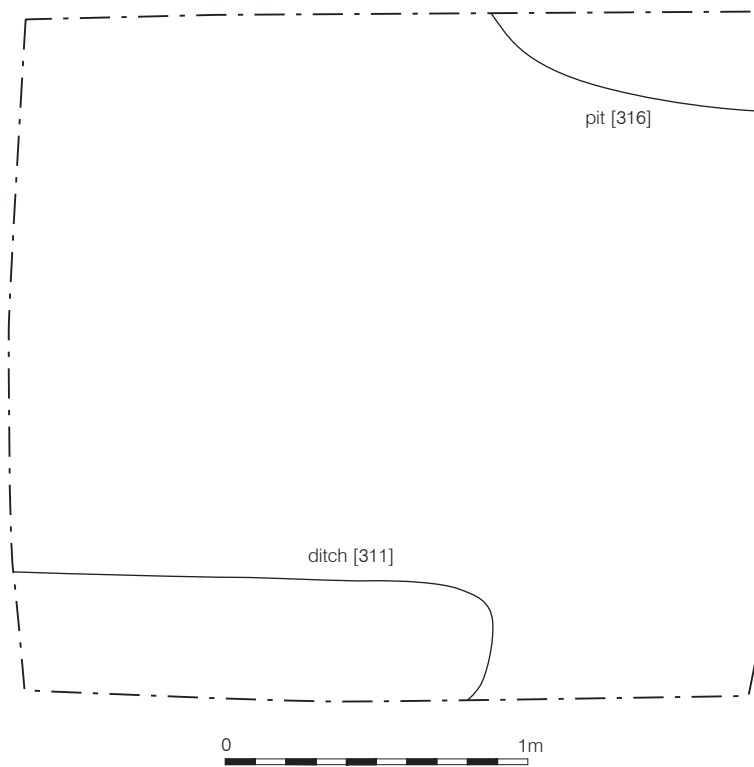
Vault 5 South Phase 3c



Vault 2 South Phase 3e



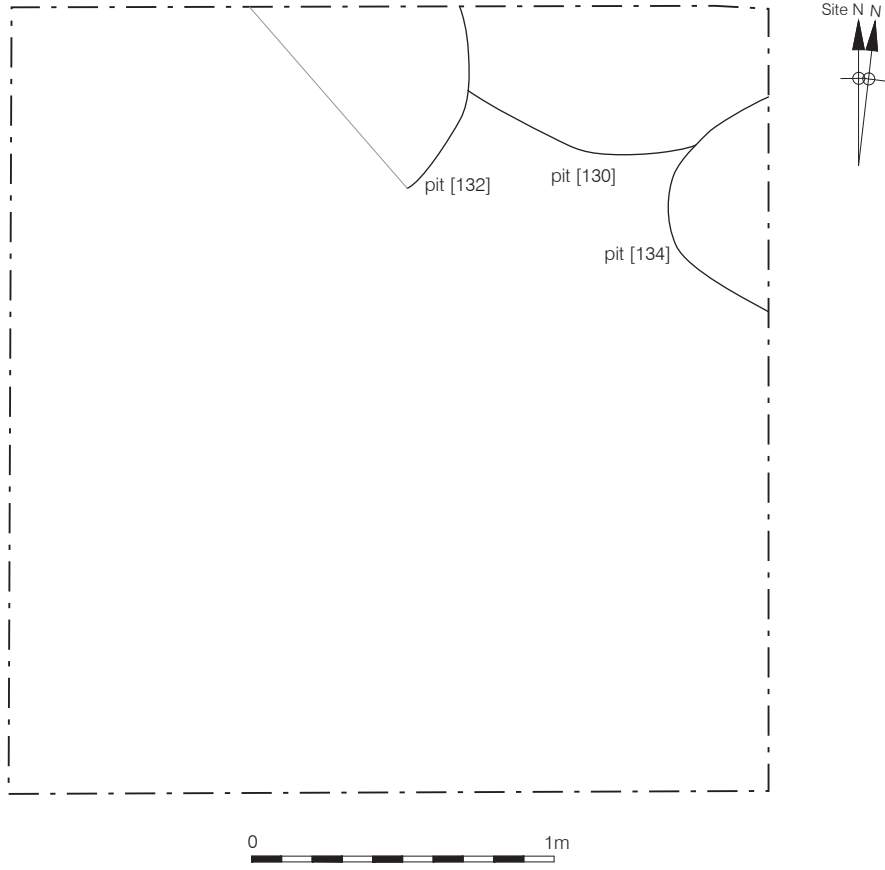
Vault 5 South Phase 3e



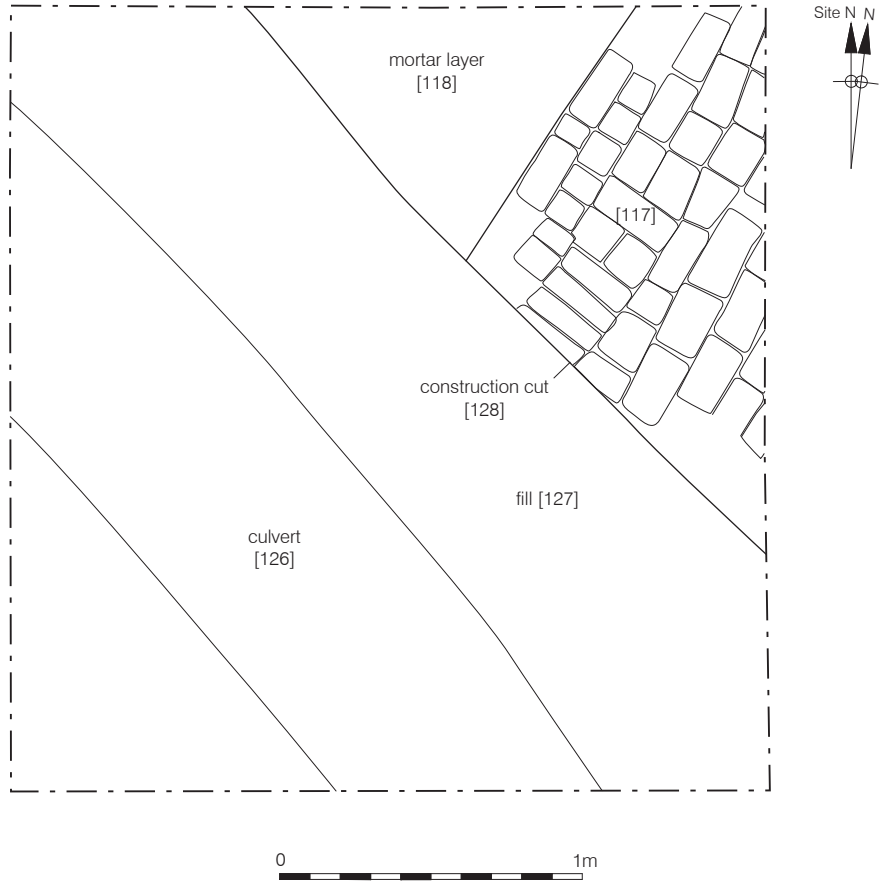
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Figure 7
Vault 2 South Phase 3e; Vault 5 South Phase 3e
1:25 at A4

Vault 5 North Phase 4



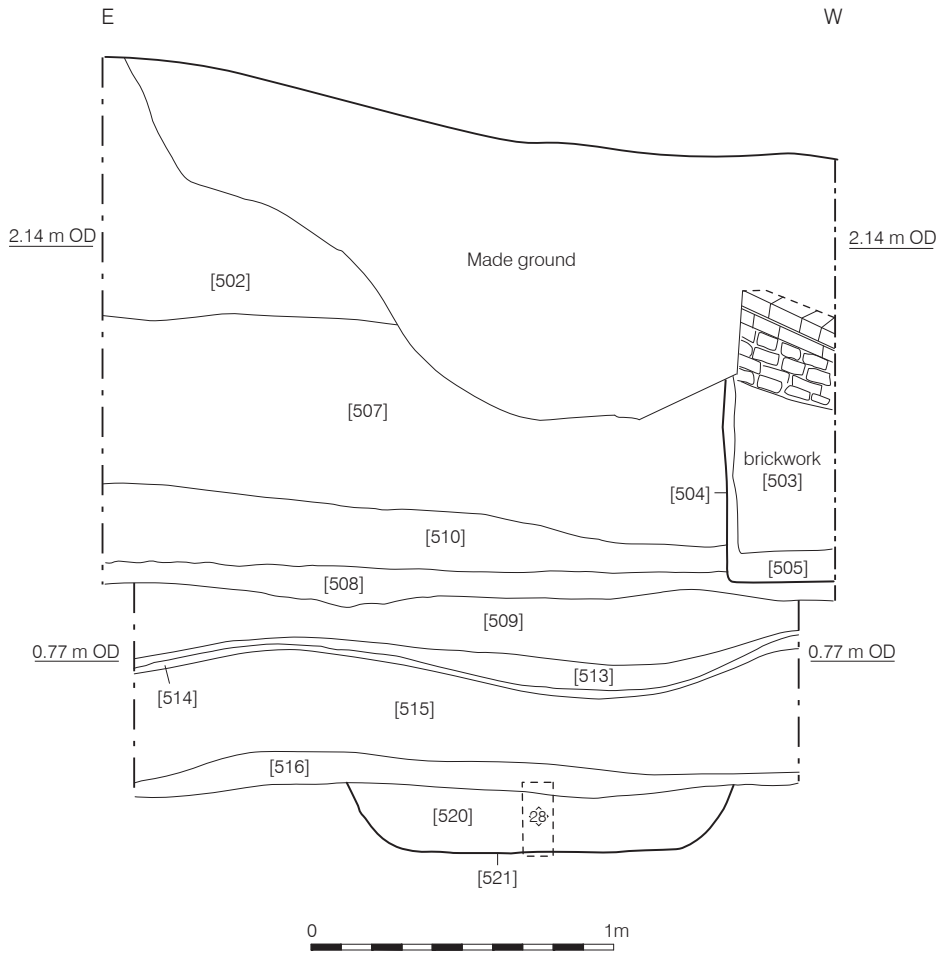
Vault 5 North Phase 5a



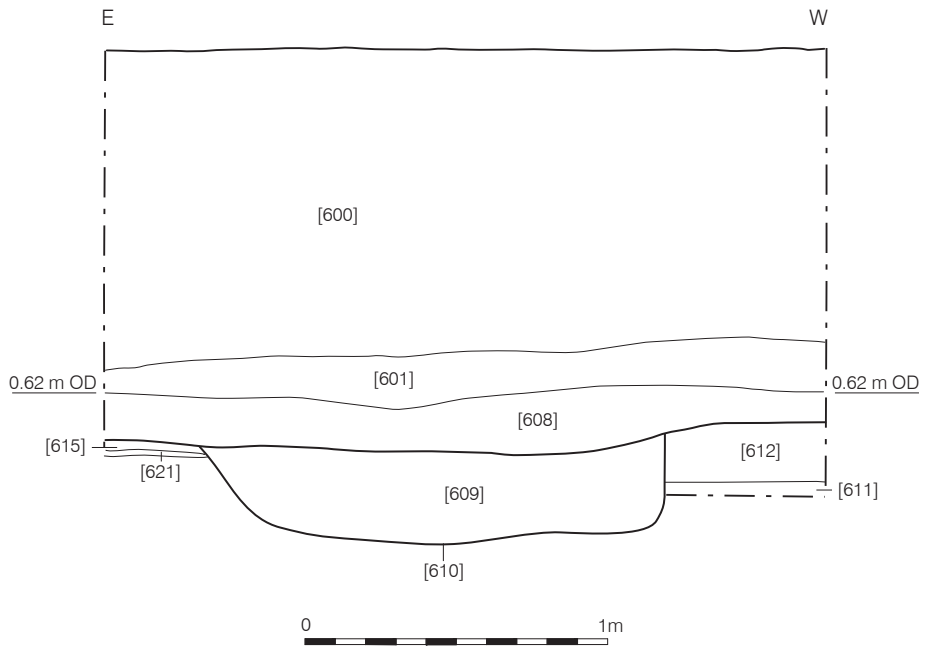
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Figure 8
Vault 5 North Phase 4; Vault 5 North Phase 5a
1:25 at A4

Vault 2 North Section 21



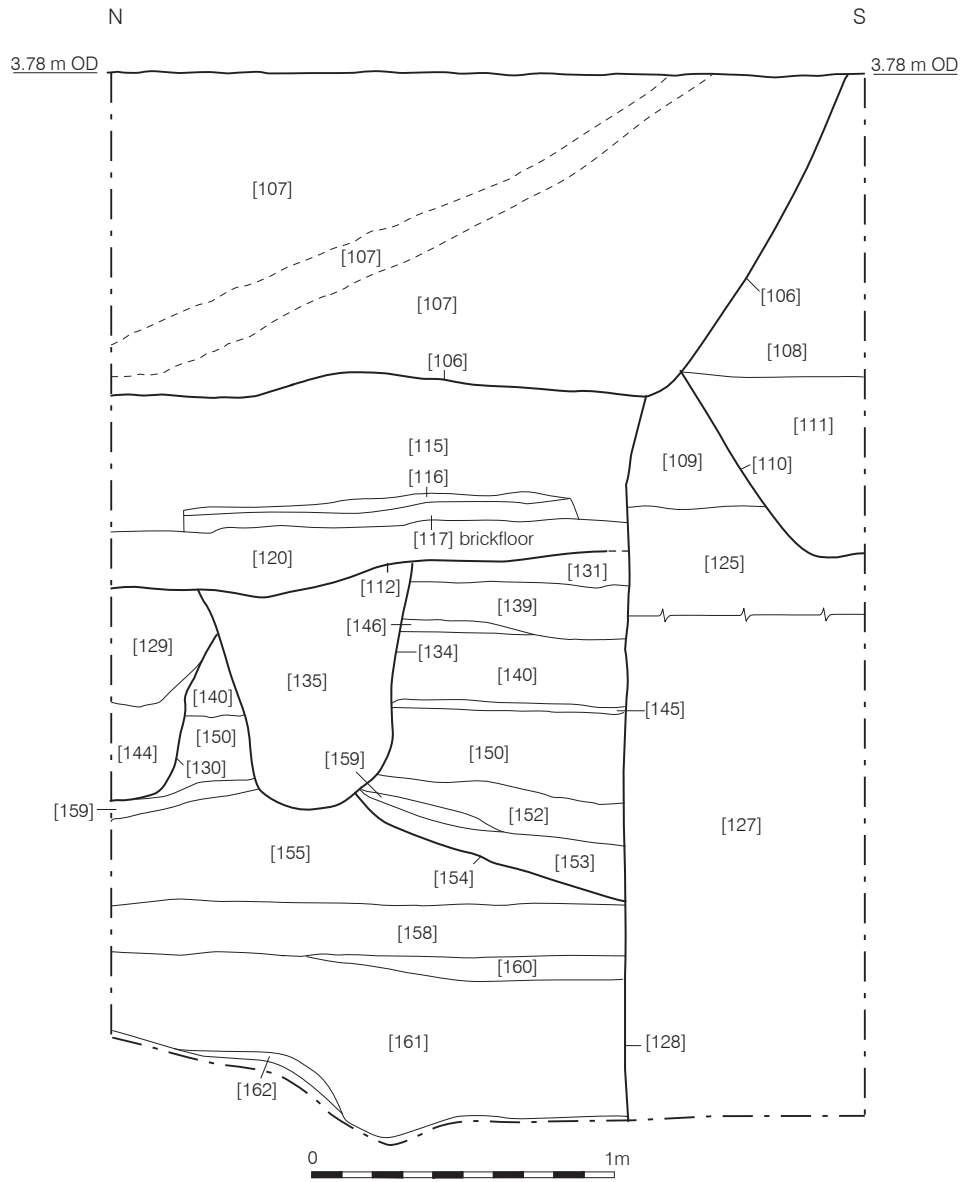
Vault 2 South Section 30



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Figure 9
Vault 2 Sections
1:25 at A4

Vault 5 North Section 2



Vault 5 South Section 11

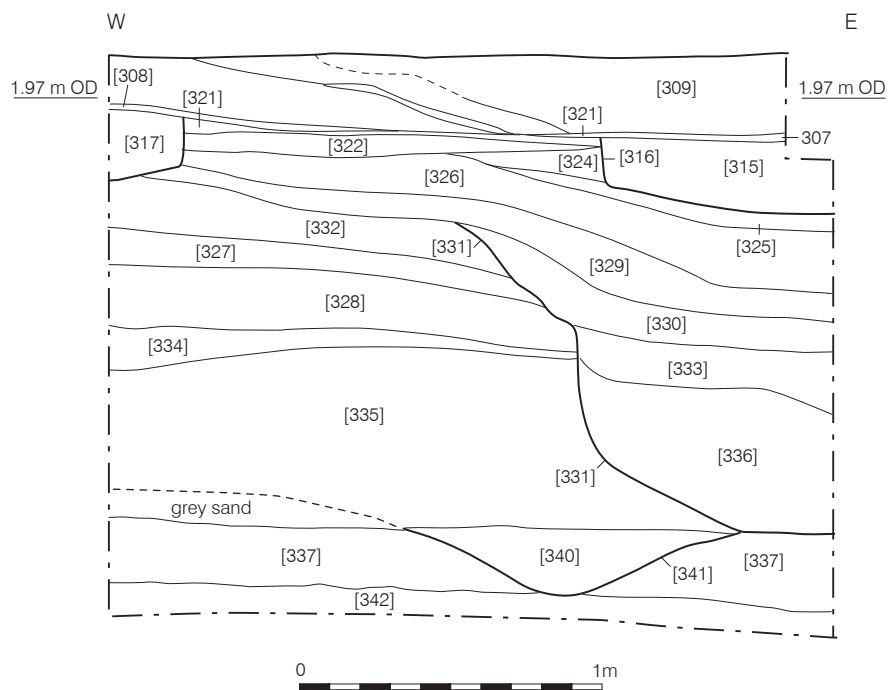




Plate 1: Working shot in Vault 5



Plate 2: Vault 5 South, ditch [341]



Plate 3: Vault 2 South, timber [618]



Plate 4: Vault 5 South, mortar surface [334]



Plate 5: Vault 2 North, organic layer [514]



Plate 6: Vault 5 South, pit [331] in section



Plate 7: Vault 5 South, pit [331]



Plate 8: Vault 5 North, brick floor [117]



Plate 9: Vault 5 North, brick culvert [126]

8 PHASED DISCUSSION

8.1 Phase 1 - Natural

- 8.1.1 Naturally deposited sandy gravel was exposed throughout the entirety of all four trenches at heights ranging between 0.09m OD and 0.70m OD.

8.2 Phase 2a – Prehistoric/Early Roman

- 8.2.1 A number of Phase 2a cut features were recorded in Vault 2 North and Vault 5 South during Phase 2a. The cut features consisted of a pit, a possible ditch and a number of irregular shaped features, possibly representing undulations in the natural topography. In general, the infills of the features seem to be indicative of natural infilling, however the presence of cultural material within some of the fills certainly indicates that human activity was taking place in the vicinity. Some of the features contained no datable cultural material within their fills and it is stratigraphically possible that they could date to the prehistoric or early Roman periods, however other Phase 2a features produced early Roman material indicating that the infilling of at least some of the features can be dated to the early Roman period.

8.3 Phase 2b – Early Roman (Mid/Late 1st century)

- 8.3.1 Phase 2b Roman layers were recorded in Vault 2 North, Vault 2 South and Vault 5 North whilst a Phase 2b pit was recorded in Vault 2 South. The earliest Phase 2b activity comprised a series of organic peaty clay layers thought to be indicative of a waterlogged environment. The Phase 2b peaty clay deposits were encountered between heights of 0.45m OD and 0.82m OD and pottery dated to the second half of the 1st century AD was retrieved during their excavation.
- 8.3.2 Some of the organic deposits in Vault 2 contained quantities of wood working waste and it is possible that wood-working was being undertaken in the vicinity of this vault. It is of particular interest that a large structural timber was also found within Vault 2 South during Phase 2b, for it is possible that the large timber could either represent a small part of an *in situ* timber structure or alternatively it could be a discrete waste item discarded into a pit during the early Roman period.

8.4 Phase 3a – Roman (Mid 1st/2nd century)

- 8.4.1 The only Phase 3a activity recorded on site was encountered in Vault 2 South and comprised two sub-square pits which contained cultural material dated to AD 50-160. Environmental sampling of the pits found quantities of digested eel bones, the occurrence of which seems to suggest that cess material was being deposited within the pits, possibly originating from a late 1st/2nd century property/properties in the vicinity.

8.5 Phase 3b – Roman (Late 1st/2nd century)

8.5.1 Phase 3b activity was recorded within all of the excavation trenches. In Vault 2 the archaeological sequence represents a continuation of that recorded during Phase 3a, with the presence of organic clay layers being suggestive of a variable fluvial environment. Cultural material was retrieved from the layers which may imply that the waterlogged/marshy area was exploited for dumping and rubbish disposal. The Phase 3b horizons in Vault 2 were encountered between 0.51m OD and 1.15m OD.

8.5.2 Further to the east in Vault 5, variation in the Phase 3b archaeological sequence seems more suggestive of occupation activity. Burnt deposits, levelling layers, a possible mortar surface and dump deposits were encountered at heights ranging between 1.00m OD and 1.42m OD and it is suggested that this part of the site may have been occupied by a clay and timber building at this time. Comparison of Phase 3b surface levels in the east (Vault 5) and west (Vault 2) of the site suggest that the eastern part of the site was c.0.50m higher during Phase 3b, perhaps accounting for the variable evidence of land use at this time.

8.6 Phase 3c – Roman (2nd century)

8.6.1 Phase 3c activity was recorded in Vault 2 North, Vault 5 North and Vault 5 South. For the most part, the Phase 3c activity was constituted by cut features and comprised two pits, a ditch and a posthole. A large pit located partially within the boundaries of Vault 5 South was of particular interest, with quantities of 2nd century pottery, charcoal, oyster shell, fish bones, glass, and a number of metal finds being retrieved during its excavation. In addition, some 40kg of ceramic building material, plus building stone, tesserae, opus signinum and painted plaster were also retrieved from the pit fills and it is possible that the material relates to the demolition of a masonry building in the vicinity during the 2nd century.

8.7 Phase 3d – Late Roman (3rd/4th century)

8.7.1 Archaeological deposits attributed to Phase 3d were encountered in Vault 2 South, Vault 5 North and Vault 5 South. These were comprised of stratified dump layers, the excavation of which produced quantities of late Roman pottery, building material, animal bone and assemblages of other types of waste material. The presence of the late Roman dump layers suggests that the area was not developed during this time and instead this area of land seems to have utilised for dumping. The presence of a copper alloy mount within a Phase 3d dump layer in Vault 2 South may represent an intrusive item and further consideration of the object and the stratigraphic sequence in this trench will be necessary prior to publication

8.8 Phase 3e – Late Roman/post-Roman

8.8.1 Phase 3e activity was recorded in Vault 2 South and Vault 5 South and consisted of two east-west orientated linear features and a pit. The east-west orientated linear features are of particular interest as they may represent robber cuts denoting part of the footprint of an earlier building in this part of Southwark. Excavation of the Phase 3e cut features produced assemblages of residual material and it is possible that the activity could date to any time during the late Roman period through to the early medieval period.

8.9 Phase 4 – post-Roman-post-medieval

8.9.1 Phase 4 activity was recorded in Vault 2 North, Vault 5 North and Vault 5 South. The cut features and reworked layers attributed to Phase 4 contained only residual Roman material and it is suggested that Phase 4 represents an extended period of inactivity on site.

8.9.2 The presence of late medieval/early post-medieval pottery within the uppermost fill of a Phase 4 cut feature is probably a consequence of subsidence during later activity on site. Indeed, no evidence of medieval or post-medieval activity pre-dating the 18th/19th century was recorded on site and it is thought probable that the construction of the vaults during the 19th century had removed all trace of these phases of activity.

8.9.3 It should however be noted that a soakaway/cesspit recorded in Vault 2 North and backfilled during Phase 5b (see below) may have in fact been constructed during the late 17th/early 18th century. The soakaway/cesspit may also have been associated with a wall currently attributed to Phase 5b and it is evident that further analysis of the stratigraphic and artefactual evidence relating to these features will be required prior to publication.

8.10 Phase 5a – 18th-19th century

8.10.1 Phase 5a activity was recorded in Vault 5 North and included a mortar floor and a brick floor, both of which suggest that a building was located above the northern part of Vault 5 during the latter part of the post-medieval period. One of the surfaces was overlain by an occupation layer containing clay pipe and glass dated to the 18th/19th century, whilst the other floor was covered by a demolition layer containing glass and pottery dated to the early part of the 19th century, both of which give an indication of the date of use and demolition of the building.

8.10.2 The demolished building was truncated by a NW-SE orientated brick culvert, the construction of which had severely truncated the earlier archaeological deposits within the majority of Vault 5 North. The available dating evidence suggests that the culvert was probably constructed around 1840, e.g. prior to the construction of the railway viaduct.

8.11 Phase 5b – 19th century

8.11.1 Phase 5b archaeological activity was recorded in Vault 2 North, Vault 2 South, Vault 5 North and Vault 5 South. In Vault 2 North a brick soakaway/cesspit, possibly constructed during the

late 17th/early 18th century (see above), was backfilled during the 19th century. A NW/SE wall was recorded in the same trench and its demolition may have occurred at the same time. Made ground deposits were recorded in Vault 2 South, whilst pits containing 19th century material were recorded in 5 North and Vault 5 South. The Phase 5b activity most probably relates to the immediate period before and/or during the construction of the 19th century vaults and railway.

9 RESEARCH OBJECTIVES

9.1 Introduction

9.1.1 A number of research priorities were identified prior to the commencement of the excavations at Railway Approach (BVL10) and additional research objectives have been identified during the post-excavation process. The research priorities and objectives have been briefly touched upon in the phased discussion (see section 8 above) and will be fully considered when all the Thameslink Borough Viaduct sites are assessed in an overall assessment and updated project design report to be produced following the individual assessment reports.

9.2 Original research objectives – General (NWR 2009b)

9.2.1 Geological/Topographic

- Does the untruncated surface of the natural sands and gravels survive? If so, can the information be used to determine the site formation processes and reconstruct the post-glacial topography of the area?

9.2.2 Prehistoric

- Is there any evidence for a prehistoric presence? If so what is the stratigraphic context and the likely date range?
- Do late prehistoric flood clays survive on the site?

9.2.3 Roman

- Do the finds from the site support a suggested date of c.AD 50 for the foundation date of Roman Southwark?
- Is there evidence of organized apportionment leading up to the earliest Roman occupation of the site, including enclosure ditches, fence lines etc?
- Is there evidence of an organized programme of land preparation, such as the digging of drainage ditches etc?
- Can the logic behind the earliest building, street and property alignments adopted be determined?
- To what extent was the layout determined by topographic features such as natural channels and existing road alignments?
- Are boundaries and alignments strictly maintained from one phase of occupation to the next?
- What are the maintenance cycles of features associated with drainage, water supply and organized access?

- What was the form, function and character of Roman Southwark? In particular, can industrial, commercial or other specialized uses be identified?
- Do the ceramic and environmental assemblages point to any specialized functions for the area?
- In what ways did the Southwark Suburb differ from *Londinium*?
- What building techniques are represented during the Roman period and how do these change through time?
- Is there any evidence of the Boudican revolt of AD 60/61 in the archaeological record?, If so, do post-Boudican structures reflect continuity from the early period, or a change in the nature or status of the area?
- Is there evidence for a period of expansion in the late 1st century AD?
- What evidence is there for higher status buildings of Roman date?
- What evidence is there for land reclamation and consolidation/control of natural channels throughout the Roman period?
- What processes of change can be identified during the later Roman period?
- Is there evidence that the settlement of Roman Southwark contracted during the late Roman period, e.g. in the form of late Roman burials in previously settled areas?
- Is dark earth present? If so, can it provide further information on the formation processes involved? What is the relationship between the nature of later Roman occupation and the 'dark earth'?

9.2.4 Saxon

- Is there any evidence of the Saxon occupation of north Southwark? If so, what is the date?

9.2.5 Medieval

- What is the nature, extent, character and identification of medieval buildings or structures on the sites?
- To what extent did the medieval town plan follow or vary from the Roman layout?
- Are historical records for the socio-economic nature of Southwark borne out by the historical evidence?
- Can environmental evidence from pit assemblages be used to reconstruct dietary and economic details?

9.2.6 Post-medieval

- Are there any surviving remains of post-medieval date? If so, how does the archaeological evidence compare with the cartographic evidence?
- Do the archaeological remains provide any information on the use and relative status of the properties represents?

- Is there any evidence of continuity of layout from the medieval period?
- What evidence is there for post-medieval industries?

9.2.7 Other

- To what extent has the archaeological sequence been truncated or disturbed by existing structures?

9.3 **Original research objectives – Railway Approach (NWR 2009b)**

9.3.1 Roman

- Is there any evidence of quarrying activity during the Roman period?
- If so, what is the date for this activity and can it be related to road construction in the vicinity?
- What is the nature of any surviving Roman structural remains on the site? How do they relate to the complex building sequence previously recorded at the London Bridge main ticket hall site (LBI95) immediately to the north-east?
- Is there any further evidence to support the theory that the north-east corner of the bridgehead island was a high status residential quarter during the 2nd century?

9.3.2 Post-medieval

- Are there any surviving in situ post-medieval burials from St Olaves burial ground (shown as the Flemish Churchyard on an early 19th century plan)?
- To what extent have any post-medieval burials been disturbed by later truncations?

9.4 **Additional Research Questions**

9.4.1 The following additional research questions could be posed following the assessment of the archaeological investigations on site:

- What sort of structure might the timber post pad be a foundation of?
- What comparisons with the Roman pottery from other areas of excavation and other sites can be made?
- How does the post-medieval pottery assemblage compare to the documentary evidence for the land use of the site?
- From where might the large amount of building material, suggesting a high status building, have come?
- How do the clay tobacco pipes relate to the documentary evidence for the land use of properties on the site?
- How does the clay tobacco pipe assemblage compare to other local sites and what does that inform temporally on the local clay tobacco pipe industry?

- What comparisons with the animal bone assemblages from other areas of excavation and other sites can be made?
- What comparisons with the fish bone assemblages from other areas of excavation and other sites can be made? Are there any imported species within the fish bone assemblages?

10 CONTENTS OF THE ARCHIVE

10.1 Paper Records

- Contexts 144 sheets
- Plans 85 sheets
- Sections 35 sheets
- Environmental Sheets 37 sheets

10.2 Finds

- Pottery 16 Boxes
- CTP 1 box
- Glass 1 box
- Small Finds/Metal objects 2 boxes
- Slag 1 box
- Building material 19 boxes
- Painted Plaster 3 boxes
- Animal bone 6 boxes

10.3 Photographic Record

- Digital 16 folders
- Black & White (35mm) 5 films
- Colour Slide (35mm) 5 films

11 IMPORTANCE OF THE RESULTS, FURTHER WORK & PUBLICATION PROPOSAL

11.1 Importance of the Results

- 11.1.1 The earliest features and deposits recorded on site have been attributed to the mid 1st century AD and are thought to have been deposited contemporary with the establishment of Roman Southwark around c.AD 50. The early deposits were recorded within the westernmost trenches and therefore occur in relative proximity to Road 1, a thoroughfare constructed in the central part of the island at this time. There is however no evidence of gravel quarrying on site and instead the early Roman deposits were largely comprised of alluvial and organic material formed above the natural gravel horizon. The nature of these deposits is seemingly indicative of a waterlogged, low-lying area of land, an interpretation which interestingly contradicts current predictive mapping of this part of the island during the mid 1st century.
- 11.1.2 If, as it seems, this part of the mid 1st century island was occupied by an isolated area of marshland, the presence of a large structural timber post pad contained within a pit truncating the alluvial/organic horizon may be associated with a large structure built on the low-lying land. Indeed, the land occupied by the site appears to have been rendered habitable by the latter part of the 1st century/early 2nd century, with dump layers, possible floor surfaces, postholes and linear features probably associated with one or more clay and timber buildings on site at this time. Any late 1st century/early 2nd century clay and timber buildings in this location at this time can be presumed to have either fronted Road 1 or an east-west orientated side road/path leading eastward from it.
- 11.1.3 The Roman remains whilst in themselves not of great significance are locally important as they provide further data regarding Roman Southwark and more importantly offer an insight into landuse immediately to the north of the major Roman masonry building at 11-15 Borough High street (BVK11).
- 11.1.4 Significant quantities of high status Roman building material were collected during the BVL10 excavations and it is of undoubted significance that high-status Roman masonry has recently been recorded during a number of excavations conducted to the immediate south of the site (BVK11; LBN08). Whilst analysis of these excavations is not complete, early indications suggest that at least some of the masonry remains certainly formed part of a building which functioned as a bathhouse. It is thought highly probable that the BVL10 building material assemblage derives from this building complex and as a consequence, analysis of the assemblage could significantly contribute to an enhanced understanding. In addition, whilst it is possible that the high-status building complex may have continued into unexcavated areas of the site, it is also possible that the absence of high-status masonry on the BVL10 excavations demarks the northern extent of the high-status building complex.

11.1.5 No Saxon or medieval activity was recorded on site and it is thought probable that this had been lost to later truncation. As a consequence the remainder of the archaeological sequence recorded during the BVL10 excavations dated to the post-medieval period and comprised the fragmentary remains of ground raising episodes and structural development. The post-medieval deposits are considered of little importance, however the results do require consideration and incorporation into future publications.

11.2 Further Work

General

11.2.1 It is recommended that unresolved inconsistencies in the stratigraphic and artefactual evidence are addressed prior to publication. In addition, full incorporation of all the specialist assessments will be made and consideration of the excavation findings alongside those from excavations in the near vicinity will be made. The main results of the eight Borough Viaduct Thameslink Assessments (TAA1-7 & 9) together with all the recommendations from the specialists from the separate assessments will be summarised and brought together in one report incorporating an overall assessment and updated project design.

Documentary Research

11.2.2 Documentary research specific to the site will be conducted prior to publication. This will specifically focus on available property records and will also incorporate the findings of a historic map regression.

Roman Pottery

11.2.3 It is recommended that the assemblage be fully recorded to Museum of London standards. MOLA form and fabric codes will be used, and the pottery will be quantified by count, weight, minimum number of vessels based on rims, and estimated vessel equivalents (EVE), also based on rims. Reference will be made to other corpora, including the National Roman Fabric Reference Collection (Tomber & Dore 1988) and the corpus of early Roman pottery from the City of London (Davies *et al.* 1994). A selection of pottery representative of assemblage composition and chronology will be illustrated. In addition, all graffiti and legible potters' stamps will be illustrated by means of a rubbing or photograph. Samian stamps will be identified and dated with reference to the volumes of *Names on Terra Sigillata* (Hartley & Dickinson 2008-2011) where possible. Rubbings of the decorated samian ware will be taken to aid identification and dating, and a selection of them will be illustrated. The pottery report will focus on questions of pottery supply to the site, pottery use, site status, and the pottery's place in local and regional contexts.

Post-Roman Pottery

11.2.4 The post-Roman pottery assemblage from the excavation is unremarkable, but it should be briefly considered with the assemblages of pottery recovered from the other Thameslink excavations.

Clay Tobacco Pipe

11.2.5 The clay tobacco pipes have the potential to date the contexts they were found in. Although the assemblage of clay tobacco pipes from the excavation is rather mundane, with the exception of the two decorated stems, it will contribute to an overall publication of the clay tobacco pipes from the Thameslink excavations. Illustrations of the two decorated pipe stems are required to supplement the text.

Glass

11.2.6 The assemblage has been recorded. A brief note summarising the character and composition of the assemblage and its dating, which can be based on the current assessment text, should be published together with a description of the two rim sherds from Roman bowls and the sherds should be illustrated.

Small Finds

11.2.7 The metal and small finds form an integral part of the archaeological data from the site, and should be included where relevant in any further publication. This is relevant for the range of identifiable finds across the phases, and particularly for the relatively unusual medieval cross-staff mount. A number of finds need further identification and for this purpose should be X-rayed or - in the case of the three coins or possible coins - be cleaned. The wooden writing tablet should be conserved and investigated for any traces of writing.

Building Materials

11.2.8 The assessment of the building material has shown a large quantity and a wide variety of dumped Roman ceramic building material and fabric – some belonging to building/buildings of some importance. The results from this study need to be published as part of an overall review of Roman building materials associated with sites from the Thameslink Project.

11.2.9 In addition, individual items requiring further research include

- The use of Green Porphyry in London (especially in light of the recent discovery of stone palette made from this material at Tobacco Dock) (Hayward pers. obs.)
- Analysis of the form and fabric of the relief patterned daub and brickearth floor slabs (looking for parallel use of the latter group) in London and further afield (e.g. Silchester)

- Identification of the different dies of roller stamped box-flue tile from the site. Are these new to Southwark? It is recommended that these should be examined by Ian Betts at the Museum of London.
- Illustration of the keyed daub, brickearth floor slabs, box flue tiles (all types), mortar and inlay stone.

Human Bone

11.2.10 No further work is recommended.

Animal Bone

11.2.11 The assemblage is very small compared to contemporary assemblages from London, in Southwark as well as within the city walls (cf. Ainsley 2002; Maltby 2010, 264). Nevertheless, the species frequency and distribution of butchery marks are similar to those recorded from other Roman urban assemblages. While the BVL10 assemblage is of little value on its own for understanding animal husbandry in suburban Londinium, it should be considered alongside others from the Thameslink project. Full analysis of Roman assemblages from the Thameslink project would contribute to wider research into animal husbandry and utilisation in and around Roman London. The sieved bones should be included in this analysis.

Fish Bone

11.2.12 Although a few significant collections of fish bones have been recovered from towns in Roman Britain, Roman fish remains are still relatively uncommon (Locker 2007) and prehistoric assemblages are even rarer. Hence it is worth fully reporting any recovered fish remains of prehistoric or Roman date. The majority of the fish remains were recovered from one sample. Since only 1/6th of the finer residue from this 30 litre sample was considered for this assessment, it is recommended that the remaining residue is fully sorted and the remains reported during the next stage of work. It is also recommended that the residues from the other three samples that contained smaller amounts of fishbone are fully sorted and the remains reported.

Leather

11.2.13 The leather fragments should be retained within the site archive. It is recommended that these pieces should be conserved for future consultation and if the site warrants publication the leather should be research on any further potential Roman leather working/cobbling activities in this area of Southwark. Also the potential garment fragment or protective sheath should also be researched to identify possible parallels.

Timber

11.2.14 The assemblage does not warrant future work although the question of what the post pad beam off-cut had supported needs to be considered.

Dendrochronology

11.2.15 No further work is required.

Charcoal and Macrofossils

11.2.16 On the basis of the assessment it is recommended that detailed analysis is carried out on the ten rich waterlogged plant assemblages from Vault 2 North and Vault 2 South. This should involve scanning of both the dry as well as the wet flots because the larger amount of soil processed for the dry flots may mean that additional and rarer (economic) species may be recorded (particularly in the larger fractions). Identifiable charred plant remains should also be extracted and quantified, while the wet and dry residues should also be fully sorted for plant remains. The remaining soil from seven of these samples could also be processed in order to potentially increase species range although part of the retained soil could be used for paraffin flotation for the recovery of additional insect remains. A record of the plant remains from the other nine samples should also be made, either using the assessment results and/or by rapid scanning, for use in the general discussion of the botanical evidence. The plant remains may address the following:

- Evidence of diet, including possible imports and exotic foodstuffs
- The use of plants for other economic activities
- The collection and use of wild plants for food and other uses, e.g. building/flooring materials
- The possible function of the Roman pits on the basis of both the botanical remains and other biological and artefactual data within these features
- The nature of the local environment in this area of Southwark and possible differences between Vault 2 North and South and any changes between the early Roman/prehistoric and Roman periods

11.2.17 There is potentially identifiable charcoal in virtually all the samples with particularly rich assemblages in seven flots although the analysis of this material can only provide general information on the range of woods present at the time but not their specific uses. A charcoal specialist should be consulted as to whether such work should be carried out.

Shell

11.2.18 Given the small size of this assemblage and the ubiquity of oyster shells in Roman deposits throughout England, no further work on this assemblage is necessary. The assemblage should, however, be considered briefly alongside others from the Thameslink excavations.

11.3 Publication Proposal

11.3.1 It is proposed that the results of this assessment report will be considered together with those from other Thameslink Borough sites (TAA1-7 & 9) and all the recommendations from the specialists from the separate assessments will be summarised and brought together in one report incorporating an overall assessment and updated project design. This report will consider the archaeological results as a whole and make detailed recommendations regarding the content and scope of the publication. At this stage it is suggested that the archaeological results and finds will be presented in a one or more monographs of the Borough area of Southwark.

12 ACKNOWLEDGMENTS

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APPENDIX 1 CONTEXT INDEX

Site Code	Context	Trench	Description	Details	NS	EW	Depth	High (m OD)	Summary Phase	Assessment Phase
BVL10	1-100	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>
BVL10	101	Vault 5 North (TH1)	Fill of pit [106]?	Friable, dark grey brown, sand silt	0.90	1.25	0.32	3.78	5c	5b
BVL10	102	Vault 5 North (TH1)	Fill of pit [106]?	Friable, white grey, silt sand	0.90	1.25	0.18	3.77	5c	5b
BVL10	103	Vault 5 North (TH1)	Fill of pit [106]?	Friable, dark grey brown, sand silt	0.90	1.25	0.28	3.65	5c	5b
BVL10	104	Vault 5 North (TH1)	Fill of pit [106]?	Firm, dark black brown, sand silt	0.90	1.25	0.21	3.38	5c	5b
BVL10	105	Vault 5 North (TH1)	Fill of pit [106]?	Firm, dark brown black, sand silt	0.90	1.25	0.15	3.18	5c	5b
BVL10	106	Vault 5 North	Pit	Triangular, steep sides, undulating base	2.45	1.70	1.10	3.78	5c	5b
BVL10	107	Vault 5 North	Fill of pit [106]	Friable, mid/dark grey brown, sand silt	2.45	1.70	1.10	3.78	5c	5b
BVL10	108	Vault 5 North	Dump/levelling	Soft, mid/dark grey brown, clayey sand silt	1.20	3.00	1.00	3.78	5c	5b
BVL10	109	Vault 5 North	Made Ground	Firm, dark black brown, sand silt	2.00	2.00	0.36	2.76	5b	5a
BVL10	110	Vault 5 North	Pit	Circular, gradual sides, base unknown	0.70	0.70	0.43	2.62	5b	5b
BVL10	111	Vault 5 North	Fill of pit [110]	Loose, grey brown, silt sand rubble	0.70	0.70	0.43	2.79	5b	5b
BVL10	112	Vault 5 North	Construction cut for [117]	Linear, steep sides, flat base	1.68	0.98	0.75	2.80	5a	5a
BVL10	113	Vault 5 North	Fill of construction cut [114]	Loose, mid brown grey, sand silt	1.70	0.90	0.20	2.77	5a	5a
BVL10	114	Vault 5 North	Construction cut for (118)	Linear, steeply sloping sides, concave base	0.80	1.10	0.74	2.77	4 or 5	5a
BVL10	115	Vault 5 North	Fill of construction cut [112]	Loose, brown grey, sand silt rubble	1.60	1.00	0.56	2.80	5a	5a
BVL10	116	Vault 5 North	Fill of construction cut [112]	Soft, grey black, charcoal rich silt	1.60	1.00	0.05	2.38	5a	5a
BVL10	117	Vault 5 North	Brick surface	Unfrogged brick, coarse sand	1.60	0.84	0.60	2.36	5a	5a
BVL10	118	Vault 5 North	Mortar surface	Soft, light grey/white, silt mortar	0.80	1.16	0.05	2.55	4 or 5	5a
BVL10	119	Vault 5 North	Fill of construction cut	Firm, light brown/grey, coarse sand	0.80	1.17	0.47	2.53	4 or 5	5a

			[114]	silt						
BVL10	120	Vault 5 North	Fill of construction cut [112]	Firm, dark grey brown, clay silt	1.30	1.40	0.23	2.31	5a	5a
BVL10	121	Void	Void	Void	Void	Void	Void	Void	Void	Void
BVL10	122	Void	Void	Void	Void	Void	Void	Void	Void	Void
BVL10	123	Vault 5 North	Fill of pit [124]	Firm, mid/dark green grey brown, clay sand silt	1.22	1.18	0.25	2.75	5c	5b
BVL10	124	Vault 5 North	Pit	Sub-circular, steep concave sides, flat base	1.22	1.18	0.25	2.75	5c	5b
BVL10	125	Vault 5 North	Dump/levelling?	Firm, dark brown black, sand silt	2.60	2.00	0.40	2.51	5b	5a
BVL10	126	Vault 5 North	Culvert within [128]	Frogged red brick, lime mortar	3.00	0.70	1.85	2.18	5b	5a
BVL10	127	Vault 5 North	Fill of construction cut [128]	Firm, mid/dark grey brown, sand clay silt	3.60	2.34	1.85	2.11	5b	5a
BVL10	128	Vault 5 North	Construction cut for [126]	Linear, near vertical sides, base unknown	3.60	2.34	1.85	2.11	5b	5a
BVL10	129	Vault 5 North	Fill of pit [130]	Firm, mid/dark grey brown, sand clay silt	1.00	1.72	0.47	2.25	4	4
BVL10	130	Vault 5 North	Pit?	Linear, steeply sloping sides, flat base	1.00	1.72	0.77	2.25	4	4
BVL10	131	Vault 5 North	Dump/levelling?	Firm, light/mid yellow brown, sand clay silt	1.96	0.52	0.45	2.17	4	3d
BVL10	132	Vault 5 North	Pit	Sub-circular, gently sloping sides, flat base	0.60	0.58	0.19	2.09	4 or 5	4
BVL10	133	Vault 5 North	Fill of pit [132]	Firm, mid brown grey, clay silt	0.60	0.58	0.19	2.09	4 or 5	4
BVL10	134	Vault 5 North	Pit	Circular, steep sides, flat base	0.62	0.30	0.84	2.13	4 or 5	4
BVL10	135	Vault 5 North	Fill of pit [134]	Soft, dark brown grey, silt clay	0.62	0.30	0.84	2.16	4 or 5	4
BVL10	136	Void	Void	Void	Void	Void	Void	Void	Void	Void
BVL10	137	Void	Void	Void	Void	Void	Void	Void	Void	Void
BVL10	138	Vault 5 North	Fill of pit [130]	Soft, light grey, clay silt	n/a	0.72	0.15	1.86	4	4
BVL10	139	Vault 5 North	Dump/levelling	Firm, light white grey, silt sand	0.50	1.20	0.13	2.04	4	3d
BVL10	140	Vault 5 North	Accumulated layer	Firm, dark brown grey/dark yellow green, silt sand clay	1.45	n/a	0.35	1.94	3 or 4	3d
BVL10	141	Vault 5 North	Pit? = [149]	Linear, stepped steep sides, concave base	0.60	0.15	0.58	1.88	4 or 5	4
BVL10	142	Vault 5 North	Fill of pit [141]/[149]	Soft, dark grey brown, silt clay	0.60	0.15	0.30	1.88	4 or 5	4

BVL10	143	Vault 5 North	Fill of pit [141]/[149]	Soft, light grey brown, silt clay	0.40	0.48	0.25	1.85	4 or 5	4
BVL10	144	Vault 5 North	Fill of pit [130]	Soft, light brown orange, silt clay	0.25	0.90	0.45	1.82	4	4
BVL10	145	Vault 5 North	Demolition	Firm, yellow brown, silt mortar rubble	1.30	1.18	0.08	1.65	3 or 4	3d
BVL10	146	Vault 5 North	Gravel surface?	Firm, light yellow orange, gravel	0.45	n/a	0.05	2.00	4	3d
BVL10	147	Vault 5 North	Fill of cut [149]	Soft, dark grey, silt clay	0.50	0.74	0.32	1.67	4 or 5	4
BVL10	148	Vault 5 North	Fill of cut [149]	Soft, mid grey brown, silt clay	0.50	0.70	0.65	1.36	4 or 5	4
BVL10	149	Vault 5 North	Pit = [141]	Irregular, steep sides, flat base	0.50	0.74	1.00	1.67	4 or 5	4
BVL10	150	Vault 5 North	Dump/levelling	Firm, mottled mid grey brown, silt clay	1.30	1.18	0.15	1.59	3 or 4	3d
BVL10	151	Vault 5 North	Demolition	Firm, grey/white, coarse silt mortar	0.64	0.48	0.08	1.42	3 or 4	3d
BVL10	152	Vault 5 North	Dump/levelling	Soft, mid brown grey/light yellow brown, fine sand silt	1.62	1.26	0.14	1.40	3 or 4	3d
BVL10	153	Vault 5 North	Fill of cut [154]	Firm, dark grey black, silt clay	1.32	0.42	0.25	1.29	3c	3c
BVL10	154	Vault 5 North	Gully?	Linear, moderately sloping sides, flat base	1.32	0.42	0.25	1.29	3c	3c
BVL10	155	Vault 5 North	Dump/levelling	Firm, mid brown/dark green, silt clay	1.40	1.00	0.29	1.29	3b	3b
BVL10	156	Vault 5 North	Fill of posthole [157]	Firm, mid/light grey, clay	0.14	0.16	0.30	1.29	3c	3c
BVL10	157	Vault 5 North	Posthole	Circular, steep sides, conical base	0.14	0.16	0.30	1.29	3c	3c
BVL10	158	Vault 5 North	Dump/levelling?	Soft, mid brown grey, clay/gravel	1.90	1.90	0.20	1.04	3b	3b
BVL10	159	Vault 5 North	Fill of cut [154]	Soft, light brown, silt clay	0.95	0.87	0.12	1.37	3c	3c
BVL10	160	Vault 5 North	Burnt Horizon	Firm, dark red/orangey black, silt clay	0.58	1.44	0.10	1.00	3b	3b
BVL10	161	Vault 5 North	Alluvium	Soft, dark blue grey, clay	2.00	1.30	0.45	0.82	2b	2b
BVL10	162	Vault 5 North	Natural	Loose, mid yellow/orange/brown, sand gravel	2.58	1.80	n/a	0.70	1	1
BVL10	163-300	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
BVL10	301	Vault 5 South	Fill of pit [302]	Soft, dark grey brown, silt clay	0.60	0.58	0.69	1.91	5a	5b
BVL10	302	Vault 5 South	Pit	Sub-circular, steep sides, concave base	0.60	0.58	0.73	1.91	5a	5b
BVL10	303	Vault 5 South	Fill of pit [304]	Loose, mid grey, sand silt rubble	0.74	0.82	0.54	1.95	5a	5b
BVL10	304	Vault 5 South	Pit	Sub-circular, near vertical sides, sloping base	0.74	0.82	0.54	1.95	5a	5b

BVL10	305	Vault 5 South	Demolition	Soft, light grey/yellowy white, clay silt mortar	1.18	1.12	0.05	1.88	5a	4
BVL10	306	Vault 5 South	Demolition	Firm, dark red/dark brown, coarse silt clay	0.84	0.48	0.10	1.95	4	4
BVL10	307	Vault 5 South	Dump/levelling	Soft, dark brown grey, clay silt	1.38	1.42	0.10	1.90	5a	4
BVL10	308	Vault 5 South	Dump/levelling	Friable, dark grey/brown, clay silt	1.22	1.14	0.20	1.95	4	4
BVL10	309	Vault 5 South	Made ground	Soft, mid grey, sand silt	2.50	2.50	0.10	2.05	5c	5b
BVL10	310	Vault 5 South	Fill of pit [311]	Loose, mid/dark grey, sand silt	0.40	1.56	0.24	1.72	4 or 5	3e
BVL10	311	Vault 5 South	Pit	Sub-rectangular, steep sides, flat base	0.40	1.56	0.24	1.72	4 or 5	3e
BVL10	312	Vault 5 South	Demolition	Loose, mid yellow brown/red brown, clayey silt	1.50	0.72	0.15	1.89	4	3d
BVL10	313	Vault 5 South	Dump/levelling?	Loose, dark grey, sand silt	0.22	1.00	0.05	1.88	3 or 4	3d
BVL10	314	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>
BVL10	315	Vault 5 South	Fill of pit [316]	Friable, mid/dark brown, sand silt	0.43	0.88	0.20	1.79	4	3e
BVL10	316	Vault 5 South	Pit	Sub-circular, concave sides, concave base	0.30	0.92	0.20	1.79	4	3e
BVL10	317	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>
BVL10	318	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>
BVL10	319	Vault 5 South	Demolition	Loose, mid to dark brown, clayey silt	1.20	1.76	0.05	1.87	4	3d
BVL10	320	Vault 5 South	Burnt Horizon	Friable, dark brown red/mid yellow brown, coarse sand	0.98	1.12	0.02	1.80	4	3d
BVL10	321	Vault 5 South	Demolition	Loose, dark black brown, sand silt	1.86	2.12	0.20	1.83	3 or 4	3d
BVL10	322	Vault 5 South	Demolition	Loose, mid yellow brown/dark black brown, sand silt clay	2.30	2.50	0.20	1.74	3 or 4	3d
BVL10	323	Vault 5 South	Demolition	Loose, dark brown black/mid green yellow, silt sand clay	0.98	1.10	0.10	1.67	3 or 4	3d
BVL10	324	Vault 5 South	Dump/levelling	Loose, mid green/grey brown, coarse sand silt	2.30	2.24	0.15	1.60	3 or 4	3d
BVL10	325	Vault 5 South	Dump/levelling	Firm, green/orange, silt sand brickearth	2.30	2.16	0.07	1.56	3 or 4	3d
BVL10	326	Vault 5 South	Dump/levelling	Loose, dark brown black, coarse silt sand	2.50	2.50	0.31	1.65	3 or 4	3d
BVL10	327	Vault 5 South	Mortar surface	Friable, mid brown yellow, silt sand mortar	1.56	1.32	0.10	1.42	3b	3b

BVL10	328	Vault 5 South	Dump/levelling	Loose, mid grey, coarse sand clay	1.64	1.80	0.20	1.36	3b	3b
BVL10	329	Vault 5 South	Dump/levelling	Firm, light grey pink, silt clay	2.25	2.25	0.25	1.75	3 or 4	3d
BVL10	330	Vault 5 South	Fill of pit [331]	Friable, dark yellow brown, coarse sand silt clay	2.50	1.25	0.15	1.56	3c	3c
BVL10	331	Vault 5 South	Pit	Circular?, steep concave sides, flat base	2.50	2.50	1.88	1.57	3c	3c
BVL10	332	Vault 5 South	Dump/levelling?	Loose, dark green grey, coarse sand silt	1.67	1.35	0.17	1.70	3c	3b
BVL10	333	Vault 5 South	Fill of pit [331]	Loose, mid pink grey, silt clay/silt	2.50	2.50	0.61	1.31	3c	3c
BVL10	334	Vault 5 South	Mortar surface	Loose, mid yellow grey, mortar/plaster clay	1.86	1.64	0.14	1.21	3b	3b
BVL10	335	Vault 5 South	Alluvium/dump?	Firm, brown grey, silt clay	2.00	1.60	0.59	1.11	3b	3b
BVL10	336	Vault 5 South	Fill of pit [331]	Loose, green grey/brown, silt sand	2.50	2.50	0.53	0.71	3c	3c
BVL10	337	Vault 5 South	Natural	Loose, mid yellow/orange/brown, sand gravel	2.00	2.36	0.26	0.52	1	1
BVL10	338	Vault 5 South	Fill of pit [339]	Firm, brown grey, silt clay	0.66	0.56	0.31	0.45	2a	2a
BVL10	339	Vault 5 South	Pit	Sub-rectangular, steep sides, flat base	0.66	0.56	0.31	0.45	2a	2a
BVL10	340	Vault 5 South	Fill of ditch [341]	Soft, dark grey brown, silt clay	0.40	0.60	0.16	0.49	2a	2a
BVL10	341	Vault 5 South	Ditch	Linear, moderately sloping sides, rounded base	0.40	0.60	0.16	0.49	2a	2a
BVL10	342	Vault 5 South	Natural	Loose, mid yellow/orange/brown, sand gravel	2.00	2.33	<i>n/a</i>	0.30	1	1
BVL10	343	Vault 5 South	Fill of pit [331]	Soft, dark green, silt clay	2.40	2.50	0.23	0.45	3c	3c
BVL10	344	Vault 5 South	Fill of pit [331]	Soft, grey, clay sand	2.39	2.50	0.27	0.12	3c	3c
BVL10	345-499	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>	
BVL10	500	Vault 2 North	Wall with [501]	Unfrogged brick, lime mortar	0.72	3.30	0.84	2.34	5c	5b
BVL10	501	Vault 2 North	Construction cut for [500]	Linear, near vertical sides, flat base	0.75	3.30	0.84	2.34	5c	5b
BVL10	502	Vault 2 North	Dump/levelling	Soft, dark grey, sand silt	2.50	2.50	0.46	2.42	5a	4
BVL10	503	Vault 2 North	Soakaway within [504]	Unfrogged brick, lime mortar	1.50	0.40	0.85	2.00	5c	5b
BVL10	504	Vault 2 North	Construction cut for [503]	Rectangular, near vertical sides, flat base	1.50	0.40	0.85	2.00	5c	5b
BVL10	505	Vault 2 North	Fill of construction cut [504]	Soft, mid grey/yellow brown, clay silt/sand silt	1.50	0.04	0.85	2.00	5c	5b

BVL10	506	Vault 2 North	Fill of soakaway [503]	Soft, mid grey, sand silt	<i>n/a</i>	<i>n/a</i>	0.85	2.00	5c	5b
BVL10	507	Vault 2 North	Made ground	Loose, dark grey brown/dark yellow brown, sand silt/sand clay	2.18	2.06	0.75	2.04	4 or 5	4
BVL10	508	Vault 2 North	Organic layer	Loose, black, wood/organic material	1.55	2.41	0.10	1.15	3b	3b
BVL10	509	Vault 2 North	Dump/levelling?	Soft, brown grey, silt clay	1.55	2.41	0.35	1.07	3b	3b
BVL10	510	Vault 2 North	Dump/levelling?	Loose, light grey brown, silt sand	1.45	2.06	0.25	1.38	3c	3b
BVL10	511	Vault 2 North	Fill of pit [512]	Soft, mid brown/blue grey, clay sand silt	0.50	0.82	0.14	0.79	3c	3c
BVL10	512	Vault 2 North	Pit	Sub-circular, concave sides, concave base	0.50	0.82	0.14	0.79	3c	3c
BVL10	513	Vault 2 North	Dump/levelling	Firm, mid blue/grey, silt clay	2.50	2.50	0.09	0.72	3b	3b
BVL10	514	Vault 2 North	Mortar surface	Firm, dark orange brown, silt clay - organic material	2.50	2.50	0.02	0.66	3b	3b
BVL10	515	Vault 2 North	Organic layer	Firm, dark to mid brown, humic silt clay	2.50	2.50	0.26	0.75	2b	2b
BVL10	516	Vault 2 North	Organic layer	Firm, dark/mid brown grey/light grey green, peat sand silt	2.50	2.50	0.11	0.58	2b	2b
BVL10	517	Vault 2 North	Natural	Loose, mid yellow/orange/brown, sand gravel	2.50	2.50	<i>n/a</i>	0.50	1	1
BVL10	518	Vault 2 North	Fill of pit? [519]	Firm, dark brown, humic silt clay sand	0.46	1.08	0.34	0.43	2a	2a
BVL10	519	Vault 2 North	Pit?	Sub-circular, steep sides, flat base	0.46	1.08	0.34	0.43	2a	2a
BVL10	520	Vault 2 North	Fill of pit? [521]	Firm, dark brown/blue/grey/orange, silt clay sand	0.58	1.26	0.35	0.49	2a	2a
BVL10	521	Vault 2 North	Pit?	Sub-circular, steep sides, flat base	0.58	1.26	0.35	0.49	2a	2a
BVL10	522-599	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>	
BVL10	600	Vault 2 South	Made ground	Soft, dark brown grey, clay silt	2.50	2.50	1.00	1.75	5c	5b
BVL10	601	Vault 2 South	Fill of ditch [602]	Soft, dark brown black, clay silt	1.78	1.45	0.20	0.73	3c	3e
BVL10	602	Vault 2 South	Ditch/Robber cut?	Linear, vertical sides, flat base	0.78	2.54	0.29	0.73	3c	3e
BVL10	603	Vault 2 South	Gravel surface?	Firm, dark brown yellow red, silt clay gravel	0.82	2.00	0.10	0.77	3b	3d
BVL10	604	Vault 2 South	Dump/levelling	Loose, dark brown black, sand clay silt	1.88	2.54	0.15	0.79	3b	3d

BVL10	605	Vault 2 South	Dump/levelling	Loose, mid grey brown/blue grey, sand silt	2.04	2.50	0.20	0.51	3b	3b
BVL10	606	Vault 2 South	Fill of pit [607]	Loose, mid grey brown, sand gravel	0.94	0.70	0.35	0.44	3a	3a
BVL10	607	Vault 2 South	Pit	Sub-square?, vertical sides, flat base	0.94	0.70	0.35	0.44	3a	3a
BVL10	608	Vault 2 South	Fill of ditch [602]?	Firm, dark black brown, silt sand - organic	0.75	2.54	0.12	0.64	3c	3e
BVL10	609	Vault 2 South	Fill of pit [610]	Soft, mid grey brown, silt sand	0.75	1.55	0.36	0.48	3a	3a
BVL10	610	Vault 2 South	Pit	Sub-square, steep sides, flat base	0.94	1.55	0.36	0.48	3a	3a
BVL10	611	Vault 2 South	Organic layer	Firm, dark black, silt clay (?) - organic	0.45	0.55	0.32	0.34	2b	2b
BVL10	612	Vault 2 South	Alluvium?	Soft, no colour description, silt clay	1.15	0.55	0.18	0.51	2b	2b
BVL10	613	Vault 2 South	Fill of pit [614]	Soft, mid brown grey, sand silt clay - organic	1.16	1.64	0.08	0.45	3a	3a
BVL10	614	Vault 2 South	Pit?	Irregular, steep sides, flat base	1.16	1.64	0.39	0.45	3a	3a
BVL10	615	Vault 2 South	Organic layer	Firm, dark black brown, degraded timber frags	1.76	0.32	0.03	0.47	2b	2b
BVL10	616	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>
BVL10	617	Vault 2 South	Fill of pit [614]	Firm, dark brown black, organic silt	0.95	1.45	0.32	0.38	3a	3a
BVL10	618	Vault 2 South	Planks within pit [614]?	Horizontally 'set', boxed heart	0.30	1.20	0.32	0.38	3a	3a
BVL10	619	Vault 2 South	Dump/levelling	Firm, light white grey, silt clay, freq mortar	0.48	0.28	0.10	0.41	2b	2b
BVL10	620	Vault 2 South	Organic layer	Soft, dark/mid red brown, silt clay	1.34	1.44	0.08	0.39	2b	2b
BVL10	621	Vault 2 South	Organic layer	Firm, mid grey black, CBM & organic clay	1.20	0.34	0.02	0.43	2b	2b
BVL10	622	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>	<i>Void</i>
BVL10	623	Vault 2 South	Natural	Loose, mid yellow/orange/brown, sand gravel	2.40	2.40	<i>n/a</i>	0.50	1	1

APPENDIX 3 ROMAN POTTERY ASSESSMENT

Edward Biddulph

Introduction

A total of 1306 sherds of Roman pottery, weighing 46,258g, were recovered from the site. The pottery was rapidly scanned to identify diagnostic forms and fabrics. This allowed context groups to be spot-dated, and provided a reasonable indication of pottery use and supply to the site. Each context group was quantified by sherd count and group weight in grammes. Fabrics were assigned standard Museum of London Archaeology common-name codes, while forms were briefly described, although samian forms were identified to type (cf. Webster 1996) where possible. The data were entered into an Access database and are summarised in Table 3.

Assemblage composition

Amphorae fragments were present in at least 25 out of 66 context groups. South Spanish olive oil containers (Dressel 20) and Gauloise wine amphorae (BAET and GAUL respectively) dominated, but other forms were noted. These included a Haltern 70 amphora, which was from southern Spain and carried *defrutum* (concentrated grape juice), an amphora (probably *Cam* 186) in a Cadiz fabric that contained fish sauce, and a Rhodian-type amphora (or possibly Dressel 2-4), which contained wine or figs. There were also a number of body sherds which were not immediately identified to type. A handle from a Dressel 20 amphora in context [604] was stamped with the maker's name. A graffito was seen on another vessel, a Gauloise amphora from context [325].

Samian ware was recorded in 36 context groups. South Gaulish samian (SAMLG), usually from La Graufesenque, was present in at least 13 groups. Five groups contained fragments from decorated bowls (form 29); plain forms were seen in these and the other eight groups. Forms included platters and dishes (forms 15/17, 18, 18R, 18/31), cups (forms 27, 27g, Ritt. 9), and the bowl Curle 11. A bowl from context [603] was stamped OF.FEICIS, which identifies the Neronian potter Felix. A graffito was seen on the base of an 18/31, and the form 29 bowl in context [335] had been repaired. Samian ware from 15 context groups was identified with reasonable certainty as coming from Lezoux in Central Gaul (SAMLZ). Four contexts contained fragments of form 37 decorated bowls. One vessel, from context [336], had a mould-maker's signature. Plain forms included the form 33 cup, Curle 21 bowl, and the dish forms 18/31, 18/31R, 31 and 31R. Two name-stamps were noted, and graffiti were seen on three vessels. East Gaulish samian was tentatively identified in the form of a 31 dish and mortarium, probably form 45. Samian ware also arrived from Les Martres-de-Veyre and possibly Montans. Two name-stamps were seen on dishes not identified to source.

A range of continental and British fine wares were recorded. Colchester colour-coated ware (COLCC) was recovered from context [150], and a single sherd of Nene Valley colour-coated ware (NVCC) was noted in context [305]. Three context-groups contained colour-coated ware from the Lower Rhineland

(KOLN). Locally-made mica-dusted dishes (LOMI), which imitated prototypes in Pompeian red ware, were present in three contexts also. There was one occurrence of black eggshell ware. The commonest fine ware, though, was in reduced, usually highly burnished, fabrics (FINE), most of fairly local origin. The ware was noted in 11 context-groups. Forms included poppyhead beakers, a carinated bowl, a necked jar, everted-rim jars, a flask, and a lid. North Kent grey ware (NKGW) and Highgate Wood C fabric (HWC) were of similar tradition. A poppyhead beaker in the former was recorded in context [109], while six contexts contained the latter, which was available as poppyhead beakers and beakers with short everted rims. In addition, a fine oxidised fabric (OXID) was seen in two contexts; one vessel in the fabric was a London-ware-type bowl with compass-style decoration.

White wares were dominated by Verulamium-region white ware (VRW), which was noted in 25 context-groups. The pottery was made in Brockley Hill and other kiln sites around Verulamium, but a proportion may have arrived from a source closer to the site at Northgate House in the Walbrook valley, City of London. Potters there made Verulamium-style vessels using clay transported from the Verulamium region (Seeley & Drummond-Murray 2005). Forms included bowls with reeded rims, ring-necked flagons, a bead-rimmed flagon, a jar, and a very large flanged bowl. Five context groups contained a fine sandy white ware fabric provisionally identified as North French/Southeast English ware (NFSE). No rims were noted, but body sherds appear to represent flagons. Flagons may also have reached the site from Colchester. White ware from that source (COLWW) was present in three context-groups. Context [325] contained a cup-mouthed flagon in an unsourced white ware.

Other oxidised wares, usually with orange or red fabrics, were recorded frequently. Most occurrences were local oxidised wares (LOXI), which were present in 21 context-groups. Ring-necked flagons and lids were the commonest forms, but a flanged dish, tazza and possible beaker were also noted. Flagons were also available in an oxidised ware (OXID) not identified to source. In addition, a micaceous, but unsourced, oxidised fabric was recorded. Many of the white-slipped oxidised wares, which were seen in 16 context-groups, are likely to be Verulamium-region products (VCSW), but a proportion may have had a more local source (RWS). Forms were limited to disc-mouthed or ring-necked flagons. A white-slipped oxidised fabric from North Kent was seen in three contexts.

Verulamium-potters were also responsible for mortaria, present in six contexts. One vessel was stamped with the maker's name. Other mortaria included two Soller-type mortaria (SOLL), at least two vessels in NFSE fabric, a mortarium possibly from Aoste (AOMO), and one from the Rhone Valley (RVMO). All vessels had hooked flanges and bead rims.

Coarse reduced wares appeared to take the largest share of the assemblage. Local and unsourced grey wares (SAND) were recorded in 42 context-groups. Forms included necked jars, jars with everted rims, bead-rimmed jars, reeded-rim bowls, a plain-rimmed dish, and, more unusually, a costrel or funnel. A graffito had been incised on a jar base from context [603]. Some occurrences provisionally identified as SAND may be early Roman sandy wares ERS and ERMS, although both were identified with more certainty in some instances. A necked jar and an undiagnostic jar in fabric

ERS were noted, and a dish base with a graffito was seen in the micaceous ERMS. Black-burnished category 1 (BB1) from Dorset was seen in nine context-groups. Cooking-jars, or jars with everted rims, were noted, but most vessels were dishes. Dishes with plain rims, bead rims, incipient bead-and-flanged rims, and dropped flanges were recorded. Nineteen contexts contained wheel-made BB2 from south Essex or north Kent. Forms were confined to dishes – bead-rimmed, plain-rimmed and groove-rimmed. The same forms, plus jars with everted rims, were also available in black-burnished ware style fabrics (BBS), recovered from eight contexts. Other coarse sandy reduced wares included grey ware from the Verulamium region (VRG), seen in two contexts, and a necked jar in Alice Holt/Surrey ware (AHSU). Grog-tempered pottery was recovered from four contexts, and there at least one context contained Highgate Wood fabric B (HWB), another grog-tempered ware. Shelly wares were recorded in eight context groups. A storage jar from context 600 is likely to have arrived from north Kent (NKSH). Other examples may have arrived from south Essex (SESH), though most sherds (SHEL) were not assigned to source at this stage.

Chronology

	Sherd count	% count
Mid 1st century AD	51	4
Late 1st century AD	203	16
Mid to late 1st century AD	28	2
Early 2nd century AD	16	1
Mid/late 1st to mid 2nd century AD	82	6
Mid 2nd century AD	666	51
Mid to late 2nd century AD	181	14
Mid 2nd to mid 3rd century AD	12	1
Early/mid 3rd to 4th century AD	34	3
Roman	33	3
Total	1306	100%

Table 1: Roman pottery by ceramic phase. Quantification by sherd count

The pottery spans the later 1st to late 3rd or 4th centuries AD, though most context groups were dated on ceramic grounds to the later 1st and 2nd centuries (Table 1). Four per cent of the pottery by sherd count was recovered from groups dated to the mid 1st century (c.AD 50-70), while 16% of pottery by sherd count was recovered from groups dated to the late 1st century (c.AD 70-110). A similar range of fabrics – which included South Gaulish samian ware, Verulamium-region white ware, sandy grey wares, North French/Southeast English white ware, and amphora fragments from southern Spain and southern Gaul – was present in both phases. The mid 1st century groups, though,

contained grog-tempered pottery, while groups dating after c.AD 70/80 usually included fine reduced wares and local oxidised wares, and forms such as ring-necked flagons and poppyhead beakers.

Just 1% of pottery by sherd count was recovered from groups dated to the early 2nd century (c.AD 100-130). The dating was based on local mica-dusted ware, which is typically Trajanic or later (Davies *et al.* 1994, 136), and samian ware from Les Martres-de-Veyre. Pottery recovered from groups dated to the mid 2nd century (c.AD 120/30-170) accounted for 51% of the assemblage. Local oxidised ware, Verulamium-region white ware, and amphorae from southern Spain and Gaul were well represented, but groups were identified more readily by the presence of Central Gaulish samian, and bead- and plain-rimmed dishes and everted-rim jars in black-burnished fabrics and other reduced wares. Groups dated to the second half of the 2nd century, which contributed 14% of the assemblage by sherd count, were similar to those of mid 2nd-century date, but were distinguished largely on the basis of East and Central Gaulish samian forms, including the form 31 dish and form 45 mortarium.

A single context-group ([604]) belonged to the mid 3rd century or later. This was dated on the basis of a dropped-flange dish in BB1, which was found in association with East Gaulish samian, a Dressel 20 stamped amphora handle, North Kent white-slipped oxidised ware, and a necked jar in a fine reduced fabric.

Phase	Sherd count	% count
Unphased	30	2
Prehistoric/early Roman phase 2a	1	0
Prehistoric/early Roman phase 2b	43	3
Roman phase 3a	18	1
Roman phase 3b	221	17
Roman phase 3c	438	34
Roman/post-Roman phase 3/4	409	31
Post-Roman phase 4	43	3
Post-Roman/post-medieval phase 4/5	15	1
Post-medieval phase 5a	16	1
Post-medieval phase 5b	25	2
Post-medieval phase 5c	47	4
Total	1306	100%

Table 2: Roman pottery by stratigraphic phase. Quantification by sherd count.

The pattern of ceramic phasing is in broad agreement with the phasing obtained from the stratigraphy (Table 2). Five per cent of pottery was from contexts dated to Phase 2a or 2b (prehistoric/early Roman) and Phase 3a, the earliest Roman-period phase. Appropriately, these contexts had ceramic dates spanning the mid 1st to early 2nd century. Some 17% of pottery was recovered from contexts

dated to Phase 3b. These had ceramic dates spanning the late 1st to mid 2nd century. A total of 34% of pottery was from Phase 3c deposits. The ceramic dates for these were concentrated within the period from c AD 120 to 150/200. Eleven per cent of the assemblage by sherd count is residual, being recovered from contexts assigned to post-Roman Phases 4 and 5, while some 31% of pottery was from contexts dated to Phase 3/4.

Potential

The condition of the assemblage was good overall. Surfaces were generally well preserved; decoration, for example on the samian ware, was well-defined, while treatments such as slips and burnishing were intact. The mean sherd weight (weight / count) was 35g, which is relatively high and indicates that context groups often contained large sherds. No doubt heavy amphora fragments contributed significantly to this figure, but the rapid scan of the assemblage nevertheless confirmed that the pottery as was in good condition overall. The average context-group size was 20 sherds and 700g. A number of groups were especially large, and included context [333], which contained some 177 sherds weighing 9,600g, context [343], from which 130 sherds weighing 6,000g were recovered, and context [509], whose 112 sherds weighed 3,500g. As has been noted, while there is a moderate level of residuality, the ceramic and stratigraphic phasing of a number of groups, which are significant in terms of the amount and range of pottery present, coincide. These groups include contexts [333], [343], and [509].

These factors indicate that the assemblage has a level of integrity that makes it suitable for detailed recording and further analysis. There is good potential to refine group dates, identify the pottery more closely, and contribute further to the understanding of the stratigraphic sequence. As a result, the assemblage will make a valuable contribution to our understanding of ceramic supply and use in Roman Southwark. The data will in due course be integrated with other assemblages recovered from the Thameslink project. Analysis of the data will be further enhanced with comparison with other assemblages from Southwark (for example Cowan 2003; Cowan *et al.* 2009; Divers *et al.* 2009; Drummond-Murray *et al.* 2002; Yule 2005) and the City of London. Some of the questions that the pottery from Railway Approach can address with comparison with other sites include status (focusing in particular on the amphorae and samian (Evans 2001; Willis 1998)), trends in functional composition and cultural practice (Evans 2001), pottery use (cf. Biddulph 2008), and supply patterns.

Recommendations for future work

It is recommended that the assemblage be fully recorded to Museum of London standards. MoLA form and fabric codes will be used, and the pottery will be quantified by count, weight, minimum number of vessels based on rims, and estimated vessel equivalents (EVE), also based on rims. Reference will be made to other corpora, including the National Roman Fabric Reference Collection (Tomber & Dore 1988) and the corpus of early Roman pottery from the City of London (Davies *et al.* 1994). A selection of pottery representative of assemblage composition and chronology will be illustrated. In addition, all graffiti and legible potters' stamps will be illustrated by means of a rubbing

or photograph. Samian stamps will be identified and dated with reference to the volumes of *Names on Terra Sigillata* (Hartley & Dickinson 2008-2011) where possible. Rubbings of the decorated samian ware will be taken to aid identification and dating, and a selection of them will be illustrated. The pottery report will focus on questions of pottery supply to the site, pottery use, site status, and the pottery's place in local and regional contexts.

Products and tasks

The products of the pottery analysis will be a database, report and catalogue of illustrated pottery.

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Context	Count	Weight (g)	Comments	Date
0	1	183	Handmade BBS cooking jar. Could be BB1, but fabric not standard. Context marked + (S.4 and S.5)	120-410
0	19	607	Lid (LOXI), Roman SAND jar with everted rim, VCSW, bead-rimmed grey ware jar, SOLL mortarium, BAET. Drag. 33 (SAMLZ), SAND bead-rimmed dish. Context marked + (V.5 North)	120-200
62	1	7	Amphora chip	50-250
104	4	144	SAND, VRW, LOXI	50-70
106	1	100	GAUL	50-250
109	6	72	Body sherds: LOXI, NKGW with panel of barbotine dots, SAND (hard-fired), bead-rimmed jar (SAND)	50-100
116	1	84	Reed-rimmed bowl (SAND)	70-150
123	10	333	Bead-rimmed dish (BB2), VRW, SAND, OXID, BAET	120-160
125	14	340	Body sherd from beaker with barbotine dot decoration, probably HWC. Amphora sherd (GAUL), SAM, VRW mortarium, Reed-rimmed bowl (SAND), VRG, dish base (LOMI)	100-130
127	5	421	Dish base (?BB2), ring-necked flagon, reed-rimmed bowl (half-complete) (VRW), reed-rimmed bowl (SAND), dish (LOMI)	120-160
129	1	9	BB1	120-250
135	2	37	Reeded-rim bowl, burnt externally under rim (VRW), LOXI	70-160
139	7	77	SAND, ?beaker (LOXI), carinated bowl, cf. CAM 210 (FINE)	70-100
140	20	406	Drag. 37, Curle 21 (SAMLZ), jar with everted rim (SAND), dish (BBS), RWS, roughcast cup or beaker (KOLN)	150-200
142	2	24	Jar (VRW), jar or bowl (SAND)	50-160
145	2	12	Curle 11 (SAMLG), dish (SAMMV)	100-130
148	1	10	LOXI	70-160
150	18	165	Roughcast beaker (COLCC), SAND, VRW, HWC, LOXI, RWS, ?COLWW	120-170
151	3	26	Lid (LOXI), SAND, VRW	70-160
152	26	536	Lid (LOXI), SESH, flagon, reed-rimmed bowl (VRW), SAND, ?BLEG, SAMLG (?Drag. 29)	70-110
153	61	2273	Amphora (GAUL), lid, ring-necked flagon (VRW), SAND, beaker body sherd with barbotine dots (FINE), Drag. 27 stamped SAC[...], Drag. 30 (SAM), RWS	70-160
155	6	79	VRW, dish base sherd with graffito (ERMS), FINE, SAMLG (burnt)	50-110
301	5	117	Bead-rimmed dish (BB2), SAND	120-250
305	2	60	NVCC beaker base	170-410
306	3	140	Bead-rimmed dish (BB2), plain-rimmed dish (SAND), Drag. 18/31	120-150

			(SAMLZ)	
307	6	141	Drag. 18 base (SAMLG), LOXI, BAET, HWC	70-110
308	3	243	RWS, ?GAUL	43-410
309	1	11	Bead-rimmed dish (BB2)	120-250
310	10	242	Cooking-pot (FINE), Drag. 37 body sherd, Drag. 33, Drag. 18/31 or 31 (SAMCG), SAND, RWS, large bead-rimmed bowl or dish, AMPH	120-200
312	2	30	BB2, LOXI	120-160
313	1	63	Mortarium body sherd (SAM, probably EG)	160-240
315	15	315	Base of cooking-pot (SAND), jar/bowl base with multiple internal incisions, as if scratched during cleaning or use (FINE), bead-rimmed dish (BB2), beaker with short everted rim (HWC)	120-160
317	4	108	Dish base (BB2), Drag. 18/31 or 31 (SAM), LOXI, AMPH, VCSW	120-160
319	10	208	GROG, SAND, Drag. 18 (SAMLG), VRW	50-70
320	5	50	RWS, SAND	43-410
321	32	599	BB1, dish base with graffito within footring, Drag. 18/31 (SAMLZ), cooking-pot (SAND), COLWW, LOXI, mortarium (VRW), beaker with short everted rim, poppyhead beaker (HWC), amph with graffito (GAUL), plain-rimmed dish (BB2)	120-160
322	140	2147	VRW, HWC, flask (FINE), KOLN, jar base with graffito, funnel/costrel, bead-rimmed cooking jar (SAND), bead-rimmed dish (BB2), cooking jar (BB1), SHEL, ring-necked flagon (LOXI), Drag. 31, 33 (SAMLZ)	150-170
323	5	136	Bead-rimmed dish, plain-rimmed dish (BB2), LOXI, SAMLZ	120-200
325	85	2112	Bead-rimmed dishes (BB2), plain-rimmed and groove-rimmed dishes (BBS/SAND), cup-mouthed flagon (unsourced white ware), Drag. 37, Drag. 18/31 or 31, Drag. 33 (SAMLZ), tazza (LOXI), RWS, cooking-pot (SAND), SHEL, mortarium (VRW), MORT	120-160
326	64	1734	Drag. 18/31 or 31, Drag. 33, stamped VEGET.M or VECET.M (SAMLZ), dish (LOMI), bead-rimmed dishes, groove-rimmed dish (BB2/BBS), cooking-pot (SAND), AMPH	120-200
329	13	287	Bead-rimmed dish (BB2), plain-rimmed dish (BB1), Drag. 18/31R (SAMLZ), COLWW, flanged dish (LOXI), RWS/VCWS	120-160
330	7	326	Bead-rimmed jar (BB1), SAND, flagon base and handles (RWS/VCWS)	120-200
333	128	5653	Bead-rim dishes (BB2, BBS), jar (SAND), London-ware type bowl (fine OXID), beaker (with barb dots), lid (FINE), LOXI, GAUL, BAET, dish, Drag. 37, 33, graffito (SAMLZ)	120-160
333	49	3971	Dropped flanged dish (!) (VRW), ring-necked, disc-mouthed flagons (RWS/VCWS), mortaria (stamped) (VRW, MORT), SHEL	120-160
334	5	90	VRW, ?GROG	50-160
335	19	648	Spike (AMPH), storage jar (NKSU), VRW, VRG, SAND, Drag. 29 with repair hole (SAMLG), SAMLZ	120-150

336	43	3366	BAET, base with internal limescale-type deposit (VRW), RWS/VCWS, bead-rimmed dish (BB2), ?Drag. 18/31R, 18/31 or 31, 37 with mould-maker's signature, 44 (SAMLZ), SAND, mortaria (RVMO, AOMO)	120-200
340	1	26	SHEL	50-150
343	49	1625	Two Drag. 31s, each with name stamps (SAM), very large flanged bowl (?VRW), groove-rimmed dish (BB2), cooking-pots (SAND, BBS), flagon (OXID (sandy brown/buff fabric)), SAMMV	150-170
343	80	4339	Complete Drag. 31R + name stamp, graffito (SAMLZ or EG), mortarium (VRW, ?NFSE), ?Rhodian/Dr.2-4 AMPH, flagon (VRW), bead-rimmed dish (BB2), ring-necked flagon (RWS), poppyhead beaker (FINE), SHEL, GAUL, BAET, SAND, LOXI, KOLN, cooking-pot (BBS)	150-170
502	2	144	Lid (LOXI), groove-rimmed dish (BBS)	120-160
508	1	5	VRW	50-160
509	112	3465	Drag. 29, 18, 18/31, 27, Ritt. 12 (SAMSG), necked jar (AHSU), VRW, GAUL, SAND, bowl with groove on bead rim (SAND, like BB1), Dressel 20 (BAET), ring-necked flagon (LOXI), RWS, GAUL, bead-rimmed jar (SAND (or AHSU)), storage jar (OXID), VRW, NFSE	70-110
511	4	87	VRW, flagon (OXID), Drag. 18R (SAMLG)	50-110
514	15	183	BAET, SAND	50-250
516	9	85	Drag. 27g, 29 (SAMLG), NFSE, micaceous OXID, fine sandy white ware, jar (ERS)	50-110
600	31	1549	Dressel 20 (BAET), Haltern 70 (BAET), AMPH spike, storage jar (NKSH), MORT, necked jar (SAND), VRW, Drag. 29, 18/31 with graffito (SAMLG), CC, FINE	70-110
601	12	649	Drag. 31 (SAMLZ), necked jar (SAND), VRW, CADIZ, mortarium (MORT)	150-160
603	8	489	Bowl with name stamp OF.FEICIS (AD55-85), Drag. 29 (SAMLG), jar base with graffito (SAND), plain-rimmed dish (BB1), groove-rimmed dish (BB2)	120-200
604	34	2219	Dropped flange dish (BB1), plain-rimmed dish, necked jar (FINE), jar with everted rim/cooking-pot-type (SHEL - looks a little medieval), NKWS, SAND, GAUL, Dr. handle with stamp (BAET), mortarium (SOLL), Drag. 37, 27 (SAM - could include EG products)	240-400
605	21	1188	BB1 (?intrusive), bead-rimmed flagon (VRW), HWB, Drag. 15/17 (SAM), ?ERMS, necked jar (ERS), MORT, probably NFSE, NGWH, CC, BAET, AMPH	70-100
606	5	136	NKWS, OXID (micaceous), SAND, VRW	50-160
608	5	302	Incipient bead-and-flanged dish (BB1), OXID (micaceous), GAUL, SAND, BAET	170-250

612	1	4	RWS - could be NKWS	43-410
613	7	89	OXID, VRW, GROG, SAMLG, SAND	50-70
615	30	695	GROG, Ritt. 9 (SAMLG), part of flange from a bowl (SAM), BAET, GAUL, NFSE, SAND, VRW	50-70
616	5	187	Dish (SAMLZ), BAET, NFSE, necked jar (SAND, could be AHSU)	120-200
617	3	23	OXID (fine and rouletted), FINE	43-410
620	3	27	Drag. 27 (SAMLG), jar with everted rim (SAND), NFSE	43-110

Table 3: Summary of Roman pottery by context

APPENDIX 3 POST-ROMAN POTTERY ASSESSMENT

Chris Jarrett

Introduction

A small assemblage of post-Roman pottery was recovered from the site (2 boxes). The pottery dates from the medieval and post-medieval periods. Very few sherds show evidence for abrasion and most were probably deposited fairly rapidly after breakage. The fragmentation of the pottery ranges from sherd material to vessels with complete profiles and one intact item. Pottery was recovered from fourteen contexts and individual deposits produced only small (fewer than 30 sherds) groups of pottery.

All the pottery (60 sherds or 46 ENV and 26 sherds representing 15 ENV are unstratified) was examined macroscopically and microscopically using a binocular microscope (x20), and recorded in an ACCESS 2007 database, by fabric, form, decoration, sherd count and estimated number of vessels (ENVs). The classification of the pottery types is according to Museum of London Archaeology standards. The pottery is discussed by types and its distribution.

The pottery types

Medieval

The medieval pottery comprises three sherds from the same number of ENVs. A single jar rim is present in early medieval shelly ware (EMSH), dated 1050-1150. Single jug sherds are present in Coarse London-type ware (LCOAR), dated 1080-1200 and highly decorated London-type ware (LOND HD), dated 1240-1350.

Post-medieval

There are a total of 57 sherds of post-medieval pottery representing 43 ENVs and the range and quantification of types are shown in Table 1.

Code	Pottery type	Date range	SC	ENV
BONE	Bone china	1794-1900	1	1
BORDY	Surrey/Hampshire border ware with yellow-glaze	1550-1700	1	1
CHPO	Chinese porcelain	1580-1900	1	1
CHPO BW	Chinese blue and white export porcelain	1590-1900	2	2
CREA DEV	Creamware with developed pale	1775-1880	4	3
DUTR	Dutch red earthenware	1300-1650	1	1
ENGS	English stoneware	1700-1900	1	1
ENGS BRST	English stoneware with Bristol glaze	1830-1900	15	5
LONS	London stoneware	1600-1800	2	2
PEAR BW	Pearl ware with blue under-glaze painted decoration	1770-1820	1	1

Code	Pottery type	Date range	SC	ENV
PEAR TR	Pearl ware with under-glaze transfer-printed decoration	1770-1860	5	4
PMR	London-area post-medieval red earthenware	1580-1900	13	11
PMR SLIP	Slipped redware	1800-1900	1	1
RAER	Raeren stoneware	1480-1610	1	1
REFW	Refined white earthenware	1800-1900	2	2
TPW	Transfer-printed whiteware	1780-1900	2	2
WEST	Westerwald stoneware	1590-1900	1	1
YELL	Yellow ware	1820-1900	2	2
YELL SLIP	Yellow ware with slip decoration	1820-1900	1	1

Table 1. Post-medieval pottery types and their quantification

Surrey-Hampshire border wares are as the whiteware (one sherd) and the form is not recognisable. The London coarse red earthenware PMR is noted as thirteen sherds representing 11 ENVs and the only forms noted are flower pots and sugar cone moulds, although a possible bowl and chamber pot may be represented amongst the less diagnostic sherds.

Non-local wares are recorded as a single sherd of a 19th-century North East England slipware dish (PMR SLIP) and three sherds of Yellow ware including a possible sherd of a chamber pot with mocha decoration. British stonewares were noted as generic English stoneware (ENGS) in the form of an intact blacking bottle with a stamp proclaiming its contents. London stoneware (LONS) is noted as a cylindrical bottle. Bristol-glazed stoneware (ENGS BRST) was restricted to fifteen sherds representing some five upright bottles and one has part of a stamp on the shoulder consisting of 'J LETH...' – probably a local victualler.

Imported pottery is restricted to three sources: China, Germany and the Low Countries. Chinese porcelain occurs as a plain closed form sherd and a blue and white flatware. German Raeren stoneware (RAER) and Westerwald stoneware (WEST) occur as single sherds from drinking function forms. Also present is a sherd of Dutch redware (DUTR).

Industrial finewares (eighteen sherds, 16 MNVs) were mostly in the form of dinner plates in the Developed Creamware, Pearl ware and refined whiteware pottery types. Tea wares were noted as bone china, PEAR TR and TPW cups and a saucer. A flared bowl was noted in TPW and a chamber pot is in developed creamware.

Distribution

Table 2 shows the contexts containing post-Roman pottery, the number of sherds, the pottery types in the deposit and a spot date for the group. All the post-Roman pottery was recovered from phase 4 and 5 deposits.

Context	Phase	Trench	SC	ENV	Date range of the pottery types	Date range of the latest pottery type	Pottery types	Spot date	
108	5c	Vault North	5	1	1	1590-1900	1590-1900	CHPO BW	18th/19th C
111	5b	Vault North	5	4	1	1770-1900	1820-1900	BONE, CREA DEV, PEAR BW, REFW, YELL SLIP	1820-1900
113	5a	Vault North	5	12	1	1580-1900	1820-1900	CHPO, CREA DEV, ENGS, PEAR TR, PMR, PMR SLIP, YELL	1820-1830
119	4/5	Vault North	5	1	1	1820-1900	1820-1900	YELL	1820-1900
124	5c	Vault North	5	1	1	1080-1200	1080-1200	LCOAR	1080-1200
125	5b	Vault North	5	4	1	1590-1900	1770-1840	LONS, PEAR TR, WEST	1789-1840
127	5b	Vault North	5	1	1	1780-1900	1780-1900	TPW	1780-1900
129	5b	Vault North	5	1	1	1580-1900	1580-1900	PMR	17th-18th C
143	4/5	Vault North	5	3	1	1240-1650	1480-1610	DUTR, LOND HD, RAER	1480-1610
301	5a	Vault South	5	1	1	1770-1860	1770-1840	PEAR TR	1770-1840
303	5a	Vault South	5	1	1	1580-1900	1580-1900	PMR	1580-1900
308	4	Vault South	5	1	1	1800-1900	1805-1900	REFW	1805-1900
506	5c	Vault North	2	2	1	1580-1900	1670-1900	LONS, PMR	19th C
600	5c	Vault South	2	1	1	1050-1150	1050-1150	EMSH	1050-1150

Table 2. Distribution of pottery types showing individual contexts containing pottery, the phase of the context, the number of sherds, the date range of pottery and the date range of the latest type, the fabrics present and a suggested deposition date. SC: sherd count, ENVs: estimated number of vessels.

Significance of the assemblage

The pottery has little significance at a local level. The stratified assemblage reflects post-Roman activity on the site from c.1050 onwards, although the main body of the assemblage indicates 19th century activity. The pottery is in keeping with the ceramic profile for the London area.

The medieval pottery types recovered from the excavation are as expected for the London area, although this component of the assemblage is residual in post-medieval contexts. The absence of stratified sizable groups of medieval pottery on the site means that no inferences can be drawn regarding activity of this date.

A small group of post-medieval pottery is dated to the 16th century, while the largest quantities of post-Roman pottery are dated to the 19th century. The pottery occurs in such small groups that it is difficult to detect activities related to specific occupations, although the unstratified Bristol-glazed stoneware upright bottles may allude to a local public house or one of the many inns that lined Borough High Street.

Potential

The pottery has the potential to date the features in which it was found and to provide a sequence for them. None of the pottery merits illustration.

The medieval pottery has no potential for further study, except to indicate that activity was occurring on the site during that period. The only medieval forms identified were jugs and a jar/cooking pot. These are the main vessel shapes encountered during this period and do not illuminate activities on the site or in the vicinity at this time.

The post-medieval ceramic assemblage has little potential to inform on particular activities on the site as it is largely mundane, the exception being the stoneware bottles from a probable local inn or public house. Flower pots and sugar cone moulds were the only noticeable post-medieval redware forms and suggest that horticultural pursuits were occurring on or near the site, while the sugar cone moulds probably represent refuse from a local sugar house.

Recommendations for further work

In itself, the post-Roman pottery assemblage from the BVL10 excavation is unremarkable, but it should be briefly considered with the other assemblages of pottery recovered from the other Thameslink excavations.

APPENDIX 4 CLAY TOBACCO PIPE ASSESSMENT

Chris Jarrett

Introduction

A small assemblage of clay tobacco pipes was recovered from the site (one box). All the fragments are in good condition, indicating that they had been deposited soon after breakage. Clay tobacco pipes occur in four contexts as small groups (under 30 fragments).

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

Clay tobacco pipe types

The assemblage from the site consists of three bowls (none of which are maker marked), eleven stems and one nib or mouthpart. The bowl types range in date between 1660 and 1740, although a relief moulded stem with a local clay tobacco pipe maker's name is of 19th-century date.

1660-80

AO18: one straight-sided, heeled bowl with a quarter rim milling and a fair finish.

1680-1710

AO20: one heeled bowl with a rounded profile and a quarter rim milling and a fair finish.

1700-1740

OS10: a single heeled and upright bowl is of this type, defined as having a straight back and rounded front profile and a thick stem.

Decorated stems

There are two decorated stems. The earliest is from context [115] and has around its circumference an incuse rouletted design featuring ovals and a hanging border. The second stem (small find <2>) from context [113] is decorated in relief with lines, dots and scales and bears the name 'CRITCHFIELD 30' and 'SNOW: FIELDS BERM'. This refers to the pipe maker Joseph Critchfield, working 1828-94.

Distribution

Table 1 shows the distribution of the clay tobacco pipes, detailing the number of fragments, the date range of the types and the latest bowl, the types of bowls present, together with a spot date for each context in which pipes occur.

Context	Phase	Trench	No. of fragments	Date range of bowl types	Latest dated bowl type	Bowl types	Spot date
113	5a	Vault 5 North	6				19th century
115	5a	Vault 5 North	3				18th-19th century
127	5b	Vault 5 North	1	1700-1740	1700-1740	OS10	1700-1740
505	5c	Vault 2 North	5	1660-1710	1680-1710	AO18, AO20	1680-1710

Table 1. Distribution of clay tobacco pipes.

Significance of the assemblage

The clay tobacco pipes have little significance at a local level. The bowl forms present are typical for London. The decorated stems are of interest, the incuse design from [115] being an unusual occurrence, while the Joseph Critchfield marked stem from [113] is from an infrequently encountered mould of this long lived pipe maker. His pipes are often excavated on archaeological sites at the southern end of Borough High Street (Jarrett 2009) and in Bermondsey (Jarrett 2010).

Potential and recommendations for further work

The clay tobacco pipes have the potential to date the contexts they were found in. Although the assemblage of clay tobacco pipes from the BVL10 excavation is rather mundane, with the exception of the two decorated stems, it will contribute to an overall publication of the clay tobacco pipes from the Thameslink excavations. Illustrations of the two decorated pipe stems are required to supplement the text.

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APPENDIX 5 GLASS ASSESSMENT

Ian Scott

Methodology

The small glass assemblage has been fully recorded onto a Microsoft Excel spreadsheet and provisionally identified. Much of the glass is in good condition but some pieces are heavily weathered.

Assemblage Composition & Provenance (Tables 1-2)

The assemblage comprises 56 sherds, including 48 sherds of vessel glass, but only 7 sherds of window glass and 1 sherd that cannot be identified with certainty. Almost all the glass is stratified. The exceptions are five sherds of vessel glass, including 2 sherds from modern wine bottles and 3 sherds undiagnostic to form. Most of the glass is from contexts of Phase 4/5 (post Roman or post-medieval) (n sherds = 20), and Phase 5a (post-medieval) (n sherds = 15). The glass from these phases is almost exclusively post-medieval in date.

PHASE	Date	Context	Type			Total
			vessel	window	query	
2b	Prehistoric/ early Roman	620	1			1
		Total	1			1
3b	Roman	605	2			2
		Total	2			2
3c	Roman	153	1			1
		333			1	1
		336	2			2
		601		1		1
		Total	3	1	1	5
3/4	Late Roman/post Roman	150	1			1
		324	1			1
		Total	2			2
4	Post Roman?	315	1			1
		Total	1			1
4/5	Post Roman/ post-medieval	119	16			16
		143		4		4
		Total	16	4		20

5a	Post-medieval	113	5			5
		115	10			10
		Total	15			15
5b	Early 19th century	111	2	1		3
		Total	2	1		3
5c	19th century	104		1		1
		506	1			1
		Total	1	1		2
	unphased	us	5			5
		Total	5			5
Total			48	7	1	56

Table 1: Glass: Summary quantification by phase, context and glass type (sherd count)

PHASE	GLASS DATE										Totals
	RB	?RB	?Med	18C	18C/19C	19C	PM	Mod	PM/Mod	undated	
2b	1										1
3b	1	1									2
3c	4	1									5
³ / ₄										2	2
4	1										1
4/5			4		5				9	2	20
5a				3	2	3			7		15
5b				1				2			3
5c				1			1				2
unph								3		2	5
Total	7	2	4	5	7	3	1	5	16	6	56

Table 2: Glass: Summary quantification by phase and glass date (sherd count)

- Phase 2b (prehistoric/early Roman): single small undiagnostic sherd of vessel glass in blue green metal with a moulded rib (context [620]).
- Phase 3b (Roman): 2 sherds of vessel glass (context [605]) one a body sherd from a square bottle in blue green glass, the other undiagnostic.
- Phase 3c (Roman): 5 sherds of glass, all Roman. These include 3, and possibly 4, sherds of vessel glass: 1 body sherd probably from a square blue green bottle (context [153]), and 2 sherds from tubular rimmed bowls (both context [336]). The sherds appear to be from two different bowls

since their profiles are quite different. The fourth sherd is flat and could be from a square bottle in blue green metal or a piece of blue green window glass (context [333]). There is a sherd of probable Roman window glass (context [601]).

- Phase 3/4 (Late Roman or post-Roman): 2 sherds of undiagnostic vessel glass (contexts [150] and [324])
- Phase 4 (?post-Roman): 1 body sherd from a square blue green bottle of Roman date (context [315]).
- Phase 4/5 (post-Roman or post-medieval): 16 sherds of vessel glass and 4 sherds of window glass. The vessel glass comprises bottle glass, sherds from wine bottles, including bottles of 18th- to 19th-century date, and undiagnostic vessel glass (all context [119]). The 4 sherds of window glass (context [143]) are very weathered and could be medieval in date, but if so are almost certainly residual or redeposited.
- Phase 5a (post-medieval): 15 sherds of vessel glass from contexts [113] and [115]. The glass comprises sherds from 18th- and early 19th-century wine bottles and some thin walled sherds from bottles or flasks.
- Phase 5b (early 19th century): 2 sherds from wine bottles and a sherd of colourless window glass, which could be modern (context [111]).
- Phase 5c (19th century): 1 sherd from the base of an early to mid 18th-century wine bottle (context [506]) and a bull's eye from a sheet of crown glass (context [104]) of post-medieval date.

Significance of the assemblage

The glass assemblage is securely dated, but very small and of limited interest. It has little analytical potential. The presence of Roman glass is worthy of note.

Potential

The glass has some potential to contribute to the dating of contexts. As an assemblage the glass requires no more than a brief note summarising the composition and provenance of the glass assemblage. The two sherds from tubular rimmed bowls (context [336]) should be noted and illustrated.

Further work

The assemblage has been recorded. A brief note summarising the character and composition of the assemblage and its dating, which can be based on the current assessment text, should be published together with a description of the two rim sherds from Roman bowls (context [336]); the sherds should be illustrated.

APPENDIX 6 SMALL FINDS ASSESSMENT

Märit Gaimster

Introduction

Around 30 individual metal and bone small finds, and a single wooden object, were recovered from the excavations; they are listed in Table 1 below. The majority came from contexts dated to the Roman period, but among these finds was also a characteristic medieval copper-alloy mount (sf 32). A handful of finds came from post-medieval contexts.

Phase 2b: prehistoric/Roman

Two finds came from this phase. They comprise part of a wooden writing tablet (sf 23) and a small copper-alloy rivet fixed to a fragment of possible carbonised wood, this may be the remnant of a casket or a piece of furniture.

Phase 3 & Phase 3/4: Roman

It is likely that the majority of the 22 finds from these two phases are Roman, as suggested by three corroded copper-alloy coins (sf 2, 14 and 30) and an iron strap hinge with central pin (sf 16; cf. Manning 1985, fig. 31.3). The assemblage also includes a complete bone needle (sf 11) and a possible hairpin of bone (sf 12) and copper alloy (sf 19) along with several further fittings or objects of copper alloy and iron, notably iron nails.

Phase 4: post-Roman

Of particular interest is an openwork mount belonging to a group of similar objects identified as cross-staff heads. Consisting of a circular double-shell head with openwork, and a rectangular socket for fixing, these mounts appear to date from the 11th to 12th centuries (Bailey 1994). The mount was retrieved from a Phase 3 context, and may be regarded as intrusive here. Similar mounts based on the dodecahedron may date from the Roman period, but these are far smaller than the example here, and have circular sockets (Henig & Leahy 1989).

Phase 5: post-medieval

The handful of post-medieval finds include a small copper-alloy drop handle (sf 1), most likely from a chest of drawers, and part of an iron casket strap mount with a circular finial (sf 22).

Recommendations

The metal and small finds form an integral part of the archaeological data from the site, and should be included where relevant in any further publication. This is relevant for the range of identifiable

finds across the phases, and particularly for the relatively unusual medieval cross-staff mount. A number of finds need further identification and for this purpose should be X-rayed or - in the case of the three coins or possible coins - be cleaned. The wooden writing tablet should be conserved and investigated for any traces of writing. All recommendations for further work are included in the table below.

Bibliography

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Phase	Context	SF	Description	Recommendation
2b	620	31	incomplete wooden writing tablet; ht. 140mm with two rivet holes for fixing extant	conserve
3b	514	20	slip-knot ?bracelet of coarse copper-alloy wire; now snapped and distorted; L 275mm	further id
3b	604	30	copper-alloy coin; complete but heavily corroded; diam. 25 mm	x-ray/clean for id
3b	604	32	copper-alloy openwork cross-staff head; rectangular socket with rivet for fixing; incomplete; diam. c.55mm; ht. 65mm+; 11th–12th centuries AD	x-ray
3b	605	33	bronze ?vessel; rim fragment only; 30 x 50mm	x-ray
3c	330	bulk	iron ?object; two pieces	x-ray
3c	333	13	copper-alloy sheet/disc; incomplete; diam. c.25mm	x-ray
3c	333	14	copper-alloy coin; complete but heavily corroded; diam. 25 mm	x-ray/clean for id
3c	333	15	copper-alloy ?vessel; two pieces	x-ray
3c	333	bulk	two lumps of iron-working slag	
3c	333	bulk	iron nail; incomplete	discard
3c	343	16	iron strap hinge with central pin; strap L 55 and 65mm+	x-ray
3 or 4	151	4	copper-alloy crescent-shaped ?harness pendant; incomplete; W 50mm	x-ray
3 or 4	152	2	copper-alloy ?coin; complete but heavily corroded; diam. 25 mm	x-ray/clean for id
4	306	bulk	iron nail; incomplete	discard
3 or 4	321	bulk	iron ?nail/fitting; L 55mm+	x-ray

3 or 4	322	11	bone needle; complete with figure-of-eight drilled eye; L 98mm	
3 or 4	322	12	bone ?needle/hairpin; incomplete; L 90mm+	
3 or 4	322	bulk	iron nails; two incomplete	discard
3 or 4	324	bulk	iron nail/bar; L 95mm+	x-ray
3 or 4	325	17	small copper-alloy openwork fitting or object, corroded onto a pebble; L 18mm	x-ray
3 or 4	325	18	copper-alloy strap/fitting with ?perforated end; L 42mm; W 8mm	x-ray
3 or 4	326	19	copper-alloy ?hairpin; incomplete distorted into U-shape; L 95mm+	x-ray
4 or 5	119	21	rectangular iron ?strap fitting; W 20mm; L 80mm+	x-ray
4 or 5	143	bulk	iron ?nail; L 65mm+	x-ray
5a	113	bulk	iron nail; incomplete	discard
5a	301	bulk	iron nail/bar; L 70mm+	x-ray
5b	125	bulk	iron ?nail/fitting; L 50mm+	x-ray
5c	107	1	small copper-alloy coffin grip or furniture drop handle, Christ Church Spitalfield Type 2a; W 70mm	
5c	506	22	iron ?furniture mount; rectangular strap W 15mm; circular 30mm diam. finial with small hole for fixing; full L 85mm+	further id

Table 1: Summary of metal and other small finds

APPENDIX 7 BUILDING MATERIALS ASSESSMENT

Kevin Hayward

Introduction and Aims

Twenty boxes and part of one crate of ceramic building material, stone, wall plaster, mortar and daub were retained from excavation from the site of Railway Approach, Southwark (BVL10). This moderate sized assemblage (497 examples 113.2kg) was assessed in order to:

- Identify (under binocular microscope) the fabrics and forms of the Roman, medieval and post-medieval ceramic building material, (brick, roofing tile, floor tile, mortar, daub, painted wall plaster) in order to verify, refine or revise the phasing of the site and to produce a list of spot dates
- Correlate the archaeological sequence with a number of adjoining Borough Thameslink Viaduct sites
- Identify (under binocular microscope) the fabric and forms of stone samples to determine the geological character and source and (where possible) the function of the stone
- Review the plaster retained from the assemblage
- Make recommendations for further study, illustration and publication as appropriate

Methodology

One whole brick sample was retained from each structure in order to determine its construction date. For the remaining contexts, especially from the earlier Roman, medieval and post-medieval features, tile, brick, stone, plaster, mortar and daub was retained.

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

Roman Ceramic Building Material 379 examples 83.8kg

Large dumps of Roman ceramic building material made from many different (mainly early) fabrics were recovered mainly from later Roman pit fills [333] [336] [343] from Vault 5 South and also from earlier Roman demolition layers [509], and organic layers [515] from Vault 2 North and Vault 2 South [601] [603] [604]. The key fabrics and their proportion summarised below are broadly consistent with the percentages noted from other sites at Southwark (Pringle 2009, 191).

Fabrics

Early London Sandy Fabric Group 2815 (AD 55-160) 246 examples 56.4kg

2452; 2459a; 3004; 3006

By far the most common fabrics (67% by weight) both here and in Roman London are the early (AD 50-160) 2815 red group using local brick earth with coarse moulding sand. The very fine vitrified fabric 2452 is especially common – as also seen in an adjacent site BVK11 in complete bessalis brick from a circular structure at 11-15 Borough High Street. They are also used in box-flues, nearly all imbrices and tesserae and most of the tile throughout the site.

Later London Sandy Fabric Group 2459b (AD 120-250) 5 examples 1.3kg

By contrast examples of ceramic building material with a much finer moulding sand associated with the mica rich later London group are conspicuous by their absence. They are only used in tile mainly in later Roman dumps from Vault 5 south [333] [336] [343].

Eccles Sandy Fabric 2454; 3022 (AD 50-80) 18 examples 3.7kg

This very fine early cream-pink fabric, manufactured in the area of the Eccles villa during the mid-late 1st century, has an uneven distribution with discrete pockets in the early contexts from Vault 2 South and North [500s] [600s], the area in which there is more early box flue tile and brick. All the tegulae made from this fabric have a distinctive undercut flange profile (no. 8). A nail is represented in one tile [515], while examples of large bricks and box flue from [509] are all likely to relate to an early heated room or bath-house structure.

Radlett Iron oxide Group: early 3023; 3060 (AD 50-120) 71 examples 14kg; later 3023b; 3060b (AD 170-230) 7 examples 1.3kg

Roman ceramic building made from the very early Hertfordshire fabric group 3023 (AD 50-120), which has frequent black iron oxide and small lumps of silt, forms the second most common group at BVL10 (14kg). Here nearly all of the material is tile (tegulae) with very little used to make brick. Like the Eccles fabric it forms a higher proportion of the Roman fabrics in Vault 2 South and North [500s] [600s], suggesting that it is in this area that the earliest Roman levels concentrate.

Where the coarser, later Hertfordshire group 3023b (AD 170-230) is found it is only in small quantities as tile redeposited in later Roman dumps in Vaults 5 [153] and 2 [600]. The small round flange profile in [600] is typical of later Roman tegulae.

Silty Fabric 3018 (AD 100-120); 3238 (AD 71-100) 4 examples 285g

Banded silty Wealden fabrics are rare, forming only a background component to the overall assemblage.

Hampshire fabrics 3009 (AD 100-120) 5 examples 1.4kg

The very few early 2nd century tiles manufactured from the distinctive silty Hampshire fabric concentrate in Vault 2 South where the highest concentration of late 1st century Eccles and Radlett groups can be found.

East Sussex fabrics 3054 (AD 70-140); 3057 (AD 100-140) 5 examples 927g

This group of early chaff grog tempered bricks only appear as a background component to the overall assemblage.

Red silt/corky fabric (AD 50-200) 12 examples 3.4kg

Not yet designated a code, this group of fabrics with a porous red silty character can be found throughout London and Southwark and appears to be 2nd century in date. They only appear as a background component to the overall assemblage.

Reigate fabric 3050 (AD 140-230) 1 example 14g

This distinctive late fabric with rock inclusions had only one representative example redeposited in a post-medieval pit [502].

Calcareous Fabrics 2457; 3026 (AD 140-300) 2 examples 245g

As with other late 2nd and 3rd century ceramic building material fabrics at BVL10 (2459b; 3023b; 3050), these are poorly represented, and where they do occur they concentrate in late Roman pits in Vault 5 [301] [321] away from the main focus of early Roman activity in Vault 2.

Forms

Box Flue 7 examples

A small but extremely varied group of scored, combed, roller stamped and half-box flue tile is summarised below in Table 1 They are all made from early London sandy fabrics either the red 2815 group (2452, 3006) (AD 50-160) or the very early yellow Eccles fabric (AD 50-80) Some, like the scored example from phase 3-4 levelling [326] and half boxed examples in the phase 3-4 demolition [322] and a possible phase 3b half boxed example in the early cream Eccles fabric 2454 [509] are very early, i.e. mid to late 1st century¹. One of the two roller-stamped dies, resembling die 76 of Betts *et al.* (1997) is very rare. This group, along with fragments of numerous small bessalis type bricks, a possible opus spicatum brick fragment from the phase 3b pit fill [333], a possible cuneatus solid

¹ Box flue tile in the later fabric have been recorded elsewhere in London (Pringle 2009)

voussoir brick [343]² (Brodrribb 1987), inlays in Carrara marble, Purbeck marble and Sparta porphyry and tesserae all suggest a very early high status (heated) building(s), possibly a bath-house in the vicinity. Furthermore, the presence of such a varied group of early fabrics, keyed daub and mud-brick could place some of these early structure(s) to before the late 1st century.

Type of Die	Context	Description	Fabric	Date
Scored	Phase 3-4 Dump-Levelling [326]	Scored 40x43mm	Fine sandy some chaff 2452	AD 55-160 prob mid-late first century
Combed	1. Phase 3-4 Dump-Levelling [326] 2. Phase 3b Gravel surface [603]	Coarse comb 25mm across Coarse comb 25mm across	Fine sandy 2452 Coarse sandy 3006	AD 55-160 AD 50-160
Roller Stamp	Phase 5c post medieval made-ground [600] Phase 3b gravel surface [603]	Plain chevron design probably die 44 (Betts <i>et al.</i> 1997) Complex swirly die possibly rare die 76 (Betts <i>et al.</i> 1997)	Fine sandy 2452 Coarse sandy 3006	Dated to mid 2 nd century on context from other sites AD 50-160 probably 2 nd century as dies later fashion
Thin wall half box	1. Phase 3-4 Demolition [322] 2. Phase 3b Dump-levelling [509]	Thin-walled tapered 13mm Thin walled 18mm possible half box	Coarse sandy 3006 Coarse Cream yellow 3022 Eccles	AD 50-160 prob mid-late first century AD 50-80

Table 1. Summary of box flue tiles

Brick 78 examples 31.4kg

A feature of the assemblage throughout the site are the large quantities (over 30kg) of early broken up small (28-35mm) bessalis bricks in the common sandy fabric 2815 with occasional fragmentary larger thicker (50mm+) pedalis, lydion or even sesquipedalis bricks concentrated in Vault 2 South from phase 3b dump levelling layer [509] and phase 2b organic layer [515]. A common use for these larger bricks is to form the caps or bases of hypocaust systems (Brodrribb 1987). No stamps were recognised although some standard signature marks have been identified.

Roofing Material - Imbrex 50 examples 6.4kg

Quantities of fragmentary imbrex are high nearly always in the early sandy fabric group 2815 (AD 55-160), especially the very fine fabric 2452, with these examples always having a very coarse moulding sand. The exception is an example with a later iron oxide fabric 3060b (AD 170-230) in a phase 3c gully fill.

² Wedge shaped brick used to carry hot air across vaulted ceilings recorded at Cotton's Wharf (Pringle 2009)

Roofing Material - Tegulae/Tile 228 examples 43.4kg

Consistency in the form of the flange profile (Type 1) and large size suggest that most of the tegulae are of late 1st to 2nd century date. They form a higher proportion of the Roman assemblage in phase 3 contexts in Vault 5 South [300s] relative to the phase 3 Vault 2 areas [500s] [600s].

Tesserae 7 examples 155g

Scattered throughout the site are occasional examples of medium square and sub-rectangular red border tesserae, mainly in early sandy fabric group 2815.

Brickearth floor slabs 3 examples 1.1kg

Intermixed with numerous early Roman ceramic building fabrics in the phase 2b organic layer [515] from Vault 2 North is a small group of poorly shaped bricks or possible loomweights. Although having the same open orange earthy, chaff-rich fabric as the daub and keyed daub seen elsewhere, these examples contain numerous burnt red and white flint inclusions with coarse quartz. These objects may be Iron Age in date (e.g. 'Belgic brick'), though of course there is the possibility of them being some sort of early Roman mud brick or brickearth floor. Of additional interest is their similarity in fabric with early Neronian tile stamps at Silchester (Hayward pers. obs.). Further analysis and parallels are required in London to ascertain their function.

Painted wall plaster 23 examples 1.2kg

The small quantity of Roman painted wall plaster that has survived was in a poor condition with only traces of colour, splash and patterning. Nevertheless, there is a range of colours in the thin fresco layer including maroon, pink, olive green, grey-slaty blue and yellow, suggesting part of a rather complex design. They are backed by thick (3mm) intonaco plaster and thick (30mm) hard grey flinty, Kentish ragstone rich arricio layers.

Wall plaster concentrates in the mid Roman (phase 3b) mortar surface [334] and in the absence of any Roman structure on site probably represents dumped material from an early high status building. Studies elsewhere in Southwark (Cowan 1992; Yule 2005; Cowan *et al.* 2009) show how abundant early wall plaster wall was.

Opus signinum 3104 7 examples 2.9kg

Chunks of reused hard, white cream-pink Roman concrete vary in their constituency according to the size (2-30mm) of the angular ceramic building material inclusions and the amount of dark grey to black flint. They concentrate in early [336] and later Roman [343] pit fills and levelling layers [153] [601] [605] and would have been used as flooring surface but also as a waterproof coating around

bessalis bricks as seen at the nearby site BVK11 (Hayward pers. obs.). It is likely that the example attached to an early (AD 50-160) brick from [601] came from such a structure.

Relief Patterned Daub 3102 20 examples 1.4kg

A feature of the ceramic building material from this site was the large quantity of keyed daub in an orange earthy fabric with lots of chaff marks on the upper surface reused in post-Roman demolition layers [306] and medieval pits [301] from Vault 5 South. Two discrete designs were observed. One design is as a double straight line border with the lines 25mm apart, the other a staggered V-shaped chevron design (also 25mm across) (see Russell 1997, figure 26b). The survivability of relief patterned daub relates to the effect of intensive heat in accidental fires (Russell 1997, 47) on wattle and daub walling. It is also worth noting that relief pattern daub has not been identified in the province after AD 200 (Russell 1997, 50) probably due to the preference (certainly in London) for building in stone after that date.

Medieval Ceramic Building Material 22 examples 2.9kg

Only a scattering of medieval peg tile and brick is present, which is surprising given the proximity of St Thomas's Hospital and Southwark Cathedral. These fragments were mostly of later medieval date and all were recovered from Vault 5 North.

Brick 2 examples 168g

3031 (1350-1450); 3041 (1360-1400)

From the phase 4/5 fill of a pit [149] is a small (33mm) red-maroon brick with black vitrified chunks and lumpy clay inclusions, typical of a locally produced rare late medieval fabric. This has been identified at other sites in London such as Cheapside.

Another more common medieval brick recovered from an unstratified context is in the pale yellow calcareous rich Flemish fabric 3031 (Ryan 1996). These bricks were often associated with late medieval ecclesiastical construction in wells and culverts, as at Bermondsey Abbey and Merton Priory, and it is possible that this piece originated from St Thomas's Hospital.

Peg Tile 21 examples 2.3kg

2587 (1240-1450); 2271 (1180-1800)

Broken up glazed and unglazed medieval roofing peg tiles, intermixed with Roman fabrics, are present in the phase 4/5 fills of pits [133] [143].

Floor Tile 1 example 89g

2497 Calcareous Flemish Tile (1300-1500)

Further evidence for later medieval activity was the presence of a thin (20mm) abraded calcareous Flemish tile from an unstratified context in the area of pile 6. Complete *in-situ* glazed late medieval Flemish tiles have been uncovered in the adjacent site at BVK11 (Hayward pers. obs.) and are likely to be associated with flooring from St Thomas's Hospital.

Post-Medieval Ceramic Building Material 30 examples 14.8kg

Post-medieval activity is not only represented by three 17th and 18th century brick structures from Vault 5 North [117] and Vault 2 North [500] [503] but also by groups of roofing tile and brick in pits and construction cuts intermixed with Roman ceramic building material and stone from Vault 5 North [107] [113] [143] [148] [149].

Brick 9 examples 9.8kg

Most of the bricks recorded from these excavations had a fabric and form typical of manufacture during the 17th and 18th centuries. This was verified by the types of mortar associated with them (see below).

Tudor Red Bricks 3046; 3065 (1450-1700), 4 examples 4.4kg

The Tudor-Stuart red brick fabrics recovered from these excavations are either the poorly made very red sandy 3046 or the comparable 3065 (with flint nodules), both made from London brickearth. Their width (102-107mm) and thickness (52-60mm) are typical of 17th century rather than Tudor construction. They are used in the brick soakaway [503] from Vault 2 North and pit [143].

Intermediate fabrics 3032nr3033 (1666-1725), 2 examples 2.9kg

Shallow, wide hard maroon bricks with sunken margins have a limited late 17th to early 18th century date of manufacture. Therefore their use in wall [500] dates it to this period.

Post-Great Fire fabric 3032 (1666-1900), 3 examples 2.9kg

Following the Great Fire of London, poorly made clinker-rich unfrogged purple bricks were manufactured in large quantities. The example from the phase 5a brick surface [117] is poorly made with a sunken margin and is likely to date from the mid 17th to mid 18th century. Later machined examples, with a frog, from the phase 5c post-medieval pit fill [105] which dates from 1850-1900 may represent refuse associated with the construction of the nearby London Bridge viaduct.

Roofing Tile 17 examples 3.2kg

Peg Tile 2276 (1480-1900); 2586 (1180-1800)

The widely dated post-medieval London sandy 2276 and iron oxide 2586 peg tile fabrics with fine moulding sand are abundant throughout the site in post-medieval pits.

Pan Tile 2586 (1630-1800) 2279 (1630-1850)

Examples of curved nibbed roofing tile introduced from Holland in the early 17th century occur in phase 5c post-medieval pits [107] [113]

Floor Tile

Only one modern encaustic floor tile, manufactured from Upper Carboniferous clays in Staffordshire, was recovered from an unstratified context.

Mortar and Concrete

A summary of mortar types and concrete as well as their period of use from the excavations at BVL10 is given below and provides a chronological framework which, along with the brick and other building material, helps to subdivide the post-medieval phases at BVL10. The brown softer mortar (Type 2) is associated with earlier phase 5a post-medieval material whilst the late 18th-early 19th brick, clinker mortar (Type 4) is associated with the phase 5c wall [500] and soakaway [503].

Mortar/concrete type	Description	Use at BVL10
<i>Hard coarse white Roman mortar (Type 1)</i>	Coarse white cream mortar with tiny flecks (1mm) of rock fragments (Kentish ragstone), flint, coarse quartz some flint very large 30-40mm often burnt	Roman - Intonaco backing for painted wall plaster and as separate chunks of mortar in post Roman features [151] and mortar surface [334]
<i>Friable brown mortar (Type 2)</i>	Fine fawn sandy mortar with tiny chunks of chalk	Early post-medieval (Phase 5a) associated with fabric 16 th -17 th century brick fabric 3065 [301] [303]
<i>White Lime mortar (Type 3)</i>	White lime mortar with a lot of quartz	Early post-medieval brick [113] used on reused post great fire brick 3032nr3033 therefore 18th century
<i>Brick clinker mortar (Type 4)</i>	Busy fabric soft brick clinker mortar with some shell	Later post-medieval (Mid 18 th -Mid 19 th) century Phase 5c [500] wall and soakaway [503]
<i>Grey concrete (Type 5)</i>	Hard dark grey concrete often as mortared breccia	Late 19 th century onward Unstratified contexts attached to modern floor tile

Table 2: listing of mortar types

Stone 11 examples 5.6kg

A small but diverse range of stone types (nine) was recovered. The types and quality of the flooring stone are typical of a high status Roman building(s) in the vicinity. The geological character and source of each type (grouped by function) are summarised below.

Inlay and Paving

Carrara marble – *fine white sugary* – Metamorphic limestone, Tuscany, used in inlay from a late Roman 3c ditch fill from Vault 2 South [601].

Purbeck marble – *condensed micritic limestone packed full of small freshwater gastropod Viviparus cariniferus* - Lower Cretaceous (Purbeckian), Isle of Purbeck, eg Durlston Head, Swanage. Weathered “bleached” inlay with opus signinum from a phase 5a post-medieval pit from Vault 5 South [301].

York stone – *Olive green banded fine micaceous sandstone*. Upper Carboniferous (Namurian-Westphalian), Yorkshire. Paving from fill of post-medieval phase 5b pit from Vault 5 North [111].

Green Porphyry – *laths of pale green (altered) feldspar set in an olive green fine grained crystalline matrix* - Sparta, Greece. Fine polished inlay (or mixing palette) from an early Roman 3b dump/levelling layer from Vault 2 South [605].

Tesserae

Indurated chalk – *Fine white calcareous micritic limestone* – Upper Cretaceous chalk, with many possible sources in Southern England. Includes a small (10x10x10mm) design tessera from a Phase 3c Roman pit fill from Vault 5 South [333].

Mortar

Purbeck limestone – *dark shelly oyster fragments set in a fine dark micritic limestone matrix* – Upper Jurassic (Purbeckian), Isle of Purbeck e.g. Winspit Quarry/St Aldhelm’s Head. Slightly curved from an unstratified layer [+].

Quernstone

Nediermendig lavastone – *dark grey hard coarse vesicular lavastone* – Tertiary Eifel Mountains, Rhineland. Used in a rotary quernstone fragment from the fill of a late Roman pit fill from Vault 5 South [331].

Rubble

Kentish ragstone – *hard dark grey calcareous sandstone* – Hythe Beds. Lower Cretaceous (Lower Greensand) Maidstone area, North Downs. Examples of rubble from a late Roman (phase 3c) [343] and Roman/post Roman levelling layers [326] in Vault 5 South as well as a post-medieval pit [124].

Ashlar

Portland white bed – *Hard fine very light grey oolitic limestone*. Upper Jurassic (Portlandian) Isle of Portland, Dorset, from an unstratified sawn ashlar fragment [+].

Summary

Much of this small stone assemblage consists of flooring material and inlay typical of high-status Roman buildings in London (Purbeck marble; Sparta Porphyry, Carrara marble; indurated chalk) (Gnoli 1971; Pritchard 1986; Sudds 2008; Pringle 2009; Hayward in prep.) from early Roman phase 3b and later Roman phase 3c pits as well as redeposited in later post-medieval features. Furthermore, a German Lavastone quern, Purbeck limestone mortar and Kentish ragstone rubble are typical of materials from the Roman provincial capital. The site's position close to riverine (Thames bridging point) and road access no doubt made it easy to acquire so many stone materials. Stone assemblages at Winchester Palace (Yule 2005), Calverts Building (Cowan 1992), Tabard Square (Hayward in prep.) as well as sites from Borough High Street (Pringle 2009) all have examples of dumped early high status flooring and inlay materials indicating important early public/private building(s) in the vicinity. This stone assemblage merely reinforces the evidence for the presence of such a building nearby.

Phase Summary

A review of the building material from BVL10 has established how much Roman tile and brick there is (75% by weight) not only in the main Roman (phase 3) layers but also in underlying prehistoric/Roman (phase 2) and the overlying post-Roman phases (phase 4). With this in mind some revision of the phasing appears necessary (see spot dates – distribution).

Phase 3a Early Roman (1st century)

Because all of the building material recorded in the phase 2b organic layers in Vault 2 North (e.g. [515] [516]) and Vault 2 South (e.g. [611] [619]) is of early Roman date (AD 50-120) it is easier to combine this with the material recovered from Phase 3a early Roman pit fills [606] [613]. This small assemblage is characterised by an intermixing of very early Eccles sandy fabrics (AD 50-80), tile manufactured from the Radlett group (AD 50-120) and some London sandy fabric 2815. A feature of this part of the assemblage is the presence of possible brickearth floor slabs [515]. They are similar in fabric to early Neronian tile stamps at Silchester (Hayward pers. obs.). There is no bath-house material.

Phase 3b and Later Roman (2nd–4th century)

A very large group of dumped deposits, pit fills and possible mortar surfaces in Vaults 2 and 5 contains reused early Roman ceramic building material fabrics intermixed with rarer later 3rd and 4th century Roman material. It was necessary to group all of the phase 3-4 Roman/post Roman and phase 4 post-Roman ceramic building material from Vault 5 here, as none was found to contain medieval or post-medieval deposits. A feature of the assemblage was the quantity of high quality building materials, including dumped stone inlay material (Marble, Greek Porphyry; Purbeck marble), most of the box flue fragments, painted wall plaster from the mortar surface [334], relief patterned daub and opus signinum. In all probability a proportion of this group represents dumped bath-house material or is derived from a large under floor heated building such as the adjoining structure in BVK11.

Phase 5a Early post-medieval (1650-1700)

There is a major hiatus in deposition with the next group of building material being at least early post-Great Fire in date (1666-1750). Any Saxon or medieval activity has been truncated, and a small quantity of late medieval brick and peg tile is intermixed with Roman and post-medieval building material. In all probability this medieval material was related to the construction of St Thomas's Hospital. For this reason it was necessary to group phase 4/5 post-Roman/Early post-medieval building material from Vault 5 with phase 5a building material from this vault. The only structure present here, the brick floor [117], consists of early post-medieval brick with an early brown sandy lime mortar.

Phase 5b Later post-medieval (1750-1900)

Later post-medieval activity (here grouped together as one phase - 5b) is characterised by a harder Regency/Victorian brick, clinker mortar bonding post-Great Fire bricks such as those used in soakaway [503] and wall [500] in Vault 2 and dumps in Vault 5.

Summary

The four trenches excavated to natural encountered large dumps of Roman ceramic building material, opus signinum, painted wall plaster, keyed daub, brick earth floor slabs and worked stone that together constitute upwards of 80% of the building material assemblage at BVL10. Given that only Roman material was encountered in the underlying phase 2 LIA/ERB levels and phase 4 post-Roman levels it would seem logical that these too can be grouped together as Roman (see spot dates - distribution).

In these demolition layers and pit fills mid 1st to mid 2nd century tile fabrics (AD 50-160) dominate (98%+) with only the occasional 3rd century calcareous and sandy fabric in the Vault 2 area. There is a considerable range of early fabrics, especially in the Vault 5 area (e.g. contexts [509] [515]), derived

from a range of kiln sites in southern England. Not only are there the local 2815 sandy fabrics, there are tiles manufactured in Hertfordshire (Radlett group, AD 50-120), Kent (Eccles, AD 50-80; silty wares, AD 70-140) and Hampshire (AD 100-120). This is not surprising given the site's excellent position near the bridgehead at Southwark with good road links south of the river as well as to the Roman provincial capital and beyond.

Of interest too are the variety of high-status coloured native (Purbeck marble - grey) and continental (Sparta Porphyry – green; Carrara marble – white) stone inlays encountered in these layers. Together with a small but extremely varied group of box flue tiles (including half-box, combed, roller stamp and scored), painted wall plaster (maroon, slate blue, yellow, pink, olive-green), a possible opus spicatum brick fragment from the phase 3b mortar surface [333] and a possible cuneatus solid voussoir brick [343] provide indications of an early high status heated building or buildings(s) in the vicinity. One candidate could be the masonry structure just revealed from the on-going adjacent excavation at 11-15 Borough High Street (BVK11), composed of many stacked complete bessalis bricks coated with opus signinum. Both of these materials are common in dumps at BVL10.

Other individual items of interest (which are commented on more fully below) include rare keyed daub from [301] [306]. The survivability of relief patterned daub relates to the effect of intensive heat in accidental fires (Russell 1997, 47) on wattle and daub walling and demonstrates that at least some of the buildings fronting Watling Street were not masonry structures. The presence of relief patterned daub also provides further evidence for early dumped Roman material as building in this tradition seems to discontinue after AD 200 (Russell 1997).

Possible brickearth floor slabs have been recovered from a phase 2b organic layer [515] in Vault 2. These are rare, although other examples may have been encountered in the nearby site at BVB10 and could relate to an early hearth. Of additional interest is the similarity in fabric with early Neronian tile stamps at Silchester (Hayward pers. obs.). Further analysis and parallels are required in London to ascertain their function.

The small medieval assemblage appears to be late (1350+) based on the presence of small calcareous Flemish floor tiles and bricks and could well relate to St Thomas's Hospital. It was all recovered from Vault 5.

On the basis of mortar and brick type it is possible to sub-divide the three post-medieval structures, the wall [500], soakaway [503] and brick surface [117], into two phases of construction. Both are post-Great Fire in date with the brick surface phase 5a [117] having a sandier lime mortar that probably dates it to between 1666 and 1750. The wall and soakaway are probably contemporary, bonded with a clinker brick mortar common between 1750 and 1850.

Distribution

Context	Fabric	Form	No.	Date range of material		Latest dated material		Spot date
0	3100; 3110PM 3036; 2276; 2279; 2497; 2587; 2452; 3022; 3023; 3126; 3006	Concrete; pan and peg tile Roman tile and brick; tesserae early fabrics, Purbeck limestone mortar	18	50	1900	1480	1950	1900-1950
104	2271; 2276 2452; 3023	Glazed med peg tile and post-med peg tile cms early Roman tile	5	50	1900	1480	1900	1480-1800
107	3032; 2586	Pan tile and machined frogged machine	2	1630	1900	1850	1900	1850-1900
109	2452; 3006	Roman tile, imbrex and tesserae	5	50	160	50	160	50-160+
111	2276; 3120	York stone paving and peg tile fine moulding sand	2	1480	1950	1700	1950	1750-1950
113	2586; 2276; 3032nr3033	Pan tile and peg tile; maroon brick	3	1480	1900	1480	1900	1666-1800
117	3032	Unfrogged poorly made stock STRUCTURE	1	1666	1750	1666	1750	1666-1750
121	2271; 2276; 2452	Peg tile reuse and Roman tile	3	55	1900	1480	1900	1480-1800
123	2452; 3006; 3022; 3023; 3057; 3102; 3105	Early Roman tile, daub, brick; imbrex; Kentish ragstone	8	50	1950	50	1950	70-300+
125	2452; 3006; 3046	Roman tegula and tesserae, tile, imbrex brick Early post- medieval brick	9	50	1700	1450	1700	1450- 1700+
129	3101; 2452	Pink Roman mortar and broken up Roman tile	9	50	160	50	160	50-160+
133	2271	Unglazed peg tile ridge tile in middle	1	1180	1800	1180	1800	1400-1700
135	2452	Early Roman tesserae and tile	2	50	160	50	160	50-160+
139	2452; 3023	Early Roman brick and tile	8	50	160	50	160	50-160+
140	2452; 3023; 3100	Early Roman tile; painted wall plaster	3	50	400	50	400	50-400
143	2271; 2276; 2597; 3046; 3032	Medieval peg tile and early post-med peg tile, early medieval and post great fire brick sunken margin	18	1180	1900	1666	1900	1666-1750

Context	Fabric	Form	No.	Date range of material		Latest dated material		Spot date
145	2452; 2459a; 3023	Early Reused Roman tile, brick, imbrex and tegulae	11	50	160	50	160	50-160+
148	2276	Peg tile fine moulding sand	1	1480	1900	1480	1900	1600-1900
150	2452; 2459a; 3023; 3100	Early Roman tegulae and imbrex; Roman wall plaster	12	50	400	50	400	50-400
151	2452; 2459a; 3060; 3100	Roman painted wall plaster; Early Roman tile	10	50	400	50	400	50-400
152	2452; 2459a; 3006; RED SILT	Reused Early Roman tile and tegulae	4	50	200	50	200	50-200
153	3104; 2459a; 3060b	Opus signinum; Roman tile; tegulae; imbrex	9	50	400	50	400	170-400
155	2452	Roman tile	1	50	160	50	160	50-160
301	2452; 2459a; 3026; 3104; 3112PM ; 3102	Keyed daub, Early Roman tile; op. sig; Late Roman calcareous tile	9	50	400	50	400	140-300
303	3065	Early post-medieval brick white mortar	1	1450	1700	1450	1700	1450-1700
306	3102	Keyed daub	4	50	200	50	200	50-200+
307	3100	Painted wall plaster	1	50	400	50	400	50-400
308	3006	Early Roman tile	2	50	160	50	160	50-160+
309	3057	Early Roman brick chunk	1	70	140	70	140	70-140+
310	3102; 3006; 3009; 3060b	Keyed daub; Early and mid Roman Tile	5	50	230	50	230	170-230+
312	3006; 2452	Roman tile and imbrex	2	50	160	50	160	55-160+
313	2452	Roman imbrex	1	50	160	50	160	50-160+
317	3102	Daub	1	1500bc	1666	1500bc	1600	50-400
319	2452	Roman Tegulae	1	55	160	55	160	55-160
321	2457	Late Roman tegulae	1	140	300	140	300	140-300
322	3023;3006; REDSILT; 3018; 2452;	Early Roman tile, brick, box flue tile, tegulae	13	50	200	50	200	100-200+
323	2452	Roman brick	1	55	160	55	160	55-160+
324	2452	Roman tegula	1	55	160	55	160	55-160+
325	3104; 2452	Opus signinum Reused early Roman tegula	2	55	400	100	400	100-400
326	2452; 3105; 3023;	Scored and combed early box flue tile, Kent ragstone, Early Roman tile and tessera	13	50	1666	50	1666	50-100+
327	3101 2452	Reused early Roman tile and mortar	2	50	160	50	160	50-160+
329	2452; 3006	Reused early Roman brick,	6	50	160	55	160	55-160+

Context	Fabric	Form	No.	Date range of material		Latest dated material		Spot date
		tile and imbrex						
330	2452	Reused early Roman tile, brick, tegulae	3	50	160	50	160	55-160+
333	2452; 2459a; 3006; 3023; 3238; REDSILT; 2459b; 3125	Reused and fresh early Roman tile, brick, tegula; imbrex. Opus spicatum.stone tesserae	37	50	400	50	400	120-250
334	3104	Roman painted wall plaster	8	50	400	50	400	50-250
335	3023	Reused Roman tile and tegula	2	50	120	50	120	50-120+
336	3104; 3006; 2459b; 3023; 3004; 2459a 3100	Opus signinum, Early and Middle Roman tile and tegula, brick; imbrex; painted wall plaster	21	50	400	100	400	120-400
343	3101; 2452; 2459a; 2459B; 3006; 3023; 3105; 3104; 3123R ; REDSILT; 3100	Early reused and fresh Roman tile, brick, tesserae, lava quernstone, Kentish ragstone; op sig, mortar; painted wall plaster	39	50	400	100	400	120-400
344	2452; 2459a; 3006; 3023; Corky; REDSILT	Reused REDSILT; Roman tile; tegulae	10	50	200	50	200	50-200+
500	3032nr3033	Reused early post great fire brick STRUCTURE	1	1666	1725	1666	1725	1750-1850
502	2452; 2459a; 3050	Roman tegulae and tile, early and late tile	4	50	230	140	230	140-230+
503	3065	Possible reused early med brick mortar brick, clinker shell STRUCTURE	1	1450	1700	1450	1700	1750-1850
509	3102; 2452; 2454 2459a; 3009; 3022; 3023; 3060; REDSILT	Some reused Early Roman tile lots of Eccles, daub, tegulae, imbrex, box flue, brick	35	50	200	50	200	50-100+
515	2454; 3023; 3054; 2452; 3006 Daub rich early Roman tile, brick, mould	Some early LIA/ER daub rich fabrics; Very early Eccles, and other brick, tegulae, tile fabrics	19	50BC	160	50	160	70-100
516	3023' 3102	Daub; Reused Early Roman tile	6	1500bc	1666	1500bc	1666	50-120+

Context	Fabric	Form	No.	Date range of material		Latest dated material		Spot date
600	2452; 2454; 2459a; 2459b; 3004 3006; 3009; 3018; 3023; 3023b	Some reused early inc Eccles and mid Roman tile, imbrex, roller stamp, tegulae, brick	24	50	230	170	230	170-230+
601	2452; 3006; 3022; REDSILT; 3114R	Reused early Eccles Roman brick, tile, Carrara marble inlay	10	50	1950	50	1950	50-200
603	2452; 3006	Roller stamp and comb; box flue tile die; Roman tile; tegula, brick; imbrex	10	50	160	50	160	50-160
604	2452; 2459a; 3057; REDSILT	Early Roman reused and fresh tile, brick, tegula, imbrex, tesserae	12	50	200	50	200	70-200+
605	3104; 2452; 3006; 3023; 3120	Polished green Sparta porphyry inlay, opus signinum, Roman tile, opus signinum	8	50	400	100	400	100-400
606	3023	Roman brick	1	50	120	50	120	50-120+
608	2452; 3006; 3023	Reused early Roman tile, brick	4	50	160	50	160	50-160+
611	3023	Early Roman tegula	1	50	120	50	120	50-120
613	2459a; 3006; 3022	Early Roman tegula and imbrex including Eccles	3	50	160	50	160	50-100+
619	2459a; 3023	Early Roman tegula and tile	2	50	160	50	160	50-160
620	3006	Early Roman tile	1	50	160	50	160	50-160
621	3006; 3023	Early Roman tile and imbrex	2	50	160	50	160	50-160

Significance

It was shown in the summary that the quantity (80%), variety of tile fabrics (18) and quality of material types (rare Sparta porphyry, Carrara marble, Purbeck marble, scored, combed and roller stamped box flue tiles, tesserae, painted wall plaster, keyed daub, brickearth tiles) that this is a very important Roman assemblage. In the absence of any structure, it is clear that the materials represent demolition of an early building or buildings in the vicinity. These probably had some sort of underfloor heating. Vault 2 (closer to the apsidal structure at BVK11) had particularly high concentrations of mid 1st to mid 2nd century tile and brick, with 3rd century fabrics representing just 2% of the total. Given the similarity in fabrics and forms (bessalis bricks, opus signinum) between the structure and the dumped material from BVK11 it is quite possible that at least some of this material could represent demolition/repair to the adjoining masonry structure at 11-15 Borough High Street. Whatever type of building the material may have come from it lay at an important intersection/hub of the town and would clearly

have been a public or private building of some importance. It is clear from studies of stone and ceramic building material from elsewhere in Southwark (Crowley 1995; 2005; Pringle 2009) that high status building materials were common from at least the middle of the 1st century onwards.

All of the medieval material recovered probably dates from at least the middle of the 14th century onwards. Some of it may have derived from the closely adjacent St Thomas's Hospital.

Recommendations for further research, publication and illustration

This assessment of the building material from BVL10 has shown a large quantity and a wide variety of dumped Roman ceramic building material and fabric – some of belonging to a building or building(s) of some importance. The results from this study need to be published as part of an overall review of Roman building materials associated with sites from the Thameslink Borough Viaduct Project. In addition, individual items requiring further research include

- The use of Green Porphyry in London (especially in light of the recent discovery of stone palette made from this material at Tobacco Dock). (Hayward pers. obs.)
- Analysis of the form and fabric of the relief patterned daub and brickearth floor slabs (looking for parallel use of the latter group) in London and further afield (e.g. Silchester)
- Identification of the different dies of roller stamped box-flue tile from the site. Are these new to Southwark? It is recommended that these should be examined by Ian Betts at the Museum of London.
- Illustration of the keyed daub, brickearth floor slabs, box flue tiles (all types), mortar and inlay stone.

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APPENDIX 8 HUMAN BONE ASSESSMENT

Helen Webb & Kevin Rielly

Two human bones were recovered. One came from organic layer [516], provisionally dated to the prehistoric or early Roman period. This context also yielded 20 animal bones. A second bone, from the overlying context [515], was recovered from amongst wood samples and was recorded separately (see below).

Methodology

The human bone was assessed in accordance with national guidelines, set out by Mays *et al.* (2005) and with reference to standard protocols for examining human skeletal remains from archaeological sites (Brickley & McKinley 2004; Buikstra & Ubelaker 1994; Cox & Mays 2000). The condition was assessed according to the degree of erosion of the bone surface, and assigned a preservation grade 0 - 5+, according to McKinley (2004, 16).

Results

The human bone fragment from layer [516] comprised part of the left innominate (pelvis) bone, and incorporated parts of the ilium, ischium and ilio-pubic ramus, as well as the acetabulum (the socket for the head of the femur).

The bone surface condition was excellent and scored as Grade 0, meaning that the surface of the bone was fresh in appearance with no modifications (McKinley 2004, 16). The bone was generally dark in colour, a probable result of it having been deposited in an organic-rich context. The broken edges of the bone fragment were also dark in colour, indicating that the breaks had occurred in antiquity.

The innominate fragment was that of an adult, and a significant portion of the auricular surface was present allowing a more specific age to be estimated. It was estimated that the individual was approximately 30-39 years of age at the time of death.

A small number of features could be observed that allowed the sex of the individual to be estimated. The sciatic notch was fairly wide, the auricular surface was relatively narrow, and the acetabulum was small. In addition, the overall size of the bone was rather petite. It was therefore estimated that this bone was probably from a female skeleton. No pathological lesions or non-metric traits were observed.

A single human femur was recovered from waterlogged deposit [515] Sample No. 26, intertwined with a piece of wattling. This bone is clearly from an adult individual, aged at least 17 years, as shown by the fusion of the proximal end (after Schmid 1972, 75). While the distal end is missing it is possible to suggest an approximate total length of 410mm. Other measurements include the vertical diameter of the femoral head of 39.8mm and the medial-lateral and antero-posterior shortest breadth of the shaft of 26.3 and 24.8mm respectively.

Recommendations

No further work is recommended.

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APPENDIX 9 ANIMAL BONE ASSESSMENT

Lena Strid

The assemblage from Thameslink comprised an estimated 601 animal bone fragments from features dated to prehistoric and Roman periods. Of these, 421 fragments (70%) were hand collected and 180 (30%) were recovered from sieved bulk samples. The assessment is based on a full recording of the hand-collected bones, documented in a Microsoft Access database, which will be incorporated with the site archive.

Methodology

The bones were identified at Oxford Archaeology using a comparative skeletal reference collection, in addition to standard osteological identification manuals, such as Cohen and Serjeantson (1996), Hillson (1992) and Schmid (1972). All animal remains were counted and weighed, and where possible identified to species, element, side and zone, the latter by using Serjeantson's (1996) and Worley's (forthcoming) zoning guide. With the exception of horn cores and metapodials (Boessneck *et al.* 1964; Prummel and Frisch 1986), sheep and goat bones were not identified to species at this stage, but rather classified as 'sheep/goat'. Ribs and vertebrae, with the exception of atlas and axis, were classified by size: 'large mammal' representing cattle, horse and deer; and 'medium mammal' representing sheep/goat, pig and large dog.

The condition of the bone was graded on a 6-point system (0-5). Grade 0 equating to very well preserved bone, and grade 5 indicating that the bone had suffered such structural and attritional damage as to make it unrecognisable (Table 1).

Grade 0	Excellent preservation. Entire bone surface complete.
Grade 1	Good preservation. Almost all bone surface complete. No cracks in bone.
Grade 2	Fair preservation.
Grade 3	Poor preservation. Most bone surface destroyed.
Grade 4	Very poor preservation. No surface structure remaining.
Grade 5	Extremely poor preservation. Unlikely to be able to identify element.

Table 1. Animal bone preservation grading methodology

For ageing, Habermehl's (1975) data on epiphyseal fusion were used. Tooth wear was recorded using Grant's tooth wear stages (Grant 1982), and correlated with tooth eruption (Habermehl 1975). Sex estimation was carried out on morphological differences on cattle and sheep/goat pelvises, sheep horn cores and pig canine teeth, using data from Vretemark (1997), Prummel and Frisch (1986), and Schmid (1972). Measurements were taken according to von den Driesch (1976), using digital callipers

with an accuracy of 0.01mm. Large bones were measured using an osteometric board, with an accuracy of 1mm.

Overview of assemblage

The assessed assemblage comes from features dated to three periods: prehistoric/early Roman, Roman and late Roman/post-Roman, comprising 85, 191 and 145 fragments each. The prehistoric/early Roman and Roman periods are in turn divided into stratigraphic phases (Table 2).

	Hand retrieved bones	Sieved bones	Total
Phase 2a	2	16	18
Phase 2b	83	8	91
Phase 3a	5	47	52
Phase 3b	128	54	182
Phase 3c	58	55	113
Phase 3/4	145		145
Total fragment count	421	180	601
Total weight (g)	17901	2029	19930

Table 2. Number of hand retrieved and sieved bones, including weight

The sieved bones, recovered from sample residues sorted at the time of writing, were rapidly scanned and included one ageable pig mandible from Phase 3c and a sternum from a medium-sized wild bird from Phase 2b.

Bone condition was very good in all phases (Table 3), thus facilitating the recording and analysis of butchery marks and pathologies. Bones with gnaw marks were fairly common in Phase 3c and Phase 3/4. There were relatively fewer examples of very well preserved bone in these two phases; a possible indication that in the later/post-Roman period organic waste was less rapidly and securely disposed of than in the previous periods. The assemblage did not contain any burnt bones.

	n	0	1	2	3	4	5
Phase 2a	2		100.0%				
Phase 2b	83	1.2%	94.0%	3.6%	1.2%		
Phase 3a	5	20.0%	80.0%				
Phase 3b	128	1.6%	90.6%	7.8%			
Phase 3c	58	1.7%	51.7%	43.1%	3.4%		
Phase 3/4	145	1.4%	55.9%	41.4%	1.4%		

Table 3. Preservation level for hand-collected bones from all phases

Species

Of the 421 bones included in the assessment, an estimated 194 (46.1%) could be speciated (Table 4). The identified animals included cattle, sheep/goat, pig, horse, dog, red deer, roe deer, domestic fowl, goose and raven. A tibia from a fox or small slender dog was found in Roman pit [331].

Species	Prehistoric/ early Roman		Roman			Late Roman/ post-Roman
	2a	2b	3a	3b	3c	3/4
Cattle	1	25	2	50	18	26
Sheep/goat		2		1	3	7
Sheep				2		
Pig		5	1	2	13	19
Horse		2				
Dog					1	
Dog/fox					1	
Red deer		2				
Roe deer		1		1		
Domestic fowl				2	1	4
Goose				1		1
Raven		1				
Bird						1
Medium mammal		2		4	5	5
Large mammal	1	37		39	14	58
Indeterminate		7	2	26	2	24
Total fragment count	2	83	5	128	58	145
Identifiable to species	1	38	3	59	36	57
Total weight (g)	38	3800	281	7240	3131	3411

Table 4. Presence of identified species for all phases of the hand-collected assemblage

Cattle is the most common animal in the assemblage by number of identified fragments, followed by pig. All other mammals and birds are scarce. This species ratio is typical for a Roman urban settlement (Maltby 2010, 255-265). A total of 91 bones and teeth, mainly from cattle, could be aged (Table 5). The abundance of bones with butchery marks (Table 5) suggests that the assemblage was intensely utilized. Most of the butchered bones show axial splitting and coarse meat removal by the use of cleavers, indicative of the high demand for meat in urban environments (Maltby 2007).

	Ageable teeth	Ageable bones	Sexable bones	Measureable bones	Butchered bones	Pathological bones
Phase 2a						
Phase 2b	2	15		4	42	1
Phase 3a	1	1	1		1	
Phase 3b	7	22	6	9	50	
Phase 3c	5	12	2	2	7	
Phase 3/4	3	22	1	4	17	3

Table 5. Bones and teeth suitable for ageing, sexing, biometric analysis, butchery and pathology

Recommendations

The assemblage is very small compared to contemporary assemblages from London, in Southwark as well as within the city walls (cf. Ainsley 2002; Maltby 2010, 264). Nevertheless, the species frequency and distribution of butchery marks are similar to those recorded from other Roman urban assemblages. While the BVL10 assemblage is of little value on its own for understanding animal husbandry in suburban *Londinium*, it should be considered alongside others from the Thameslink project. Full analysis of Roman assemblages from the Thameslink project would contribute to wider research into animal husbandry and utilisation in and around Roman London. The sieved bones should be included in this analysis.

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APPENDIX 10 FISH BONE ASSESSMENT

Rebecca Nicholson

Introduction

No fish remains were recovered by hand during the excavations, but a small number of fish bones were recovered from the dried residues after soil samples had been processed by water flotation.

Methodology

After processing soil samples by water flotation to 0.5mm (residue) and 0.25mm (flot), all residues were air dried and sorted to to 10mm and a number were sorted down to 4mm. Where small bones or other ecofacts were observed, the finer fractions were retained for specialist scanning and sorting if appropriate. For this assessment, following a rapid scan of all retained fine fraction residues, a fraction (1/6th) of the 4-2mm and 2-0.5mm residue from sieved bulk sample 31 was rapidly sorted by the author and a number of fish bones extracted, in addition to fragments of eggshell and mineralised seeds/fruit stones.

Results

Sample 31 came from context [609], a fill within Roman pit [610] (phase 3a) in Vault 2 South. The fish remains comprised a number of eel (*Anguilla anguilla*) vertebrae, a significant proportion of which were crushed in a manner consistent with a faecal origin. It is likely, therefore, that this feature contained human excrement.

Fish remains were also observed in the fine residues from three other samples: sample 5 (Roman fill context [333]), sample 22 (Roman dump layer [509]) and sample 33 (prehistoric/early Roman layer), although they were uncommon.

Recommendations

Although a few significant collections of fish bones have been recovered from towns in Roman Britain, Roman fish remains are still relatively uncommon (Locker 2007) and prehistoric assemblages are even rarer. Hence it is worth fully reporting any recovered fish remains of prehistoric or Roman date. Since only 1/6th of the finer residue from this 30 litre sample was considered for this assessment, it is recommended that the remaining residue from sample 31 is fully sorted and the remains reported during the next stage of work. It is also recommended that the residues from samples 5, 22 and 33 are fully sorted and the remains reported.

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APPENDIX 11 LEATHER ASSESSMENT

Kevin Trott

Five leather fragments were retrieved from two contexts ([509] & [514]) during the excavations on the 2-4 Bedale Street site of the Thameslink project in Southwark, London.

The three pieces of leather recovered from Context [509] consist of narrow square-in-section strips of leather that resemble trimming waste, although the uniformity and dimensions of the leather may have once derived from a single thong from a sandal similar to the thong encountered on a sandal from Billingsgate Buildings in Lower Thames Street, London (Rhodes 1980, 125-6).

The leather fragments from Context [514] consisted of two conjoining cut fragments from the lobed quarter of a one-piece sandal of a similar style encountered on other Roman sites in Britain (Rhodes 1980; Van Driel-Murray 1998; Mould 1997; 2009). The fragment exhibits the lower half of a lobed quarter, with a slightly asymmetrical cutting pattern that has been partially torn on the opposing lobe. This particular sandal quarter was originally cut away from the remainder of the one-piece-pattern and was probably kept for future repairs to other footwear by a cobbler before it was later discarded.

The fifth item consisted of a flattened and buckled corner fragment of calfskin leather 1.5mm thick. No stitching holes were evident and its thickness in relation to the leather used suggests this fragment derived from form of clothing, bag or protective sheath. Further research will be required on this fragment to identify its form or function.

Recommendations

The leather fragments from Bedale Street should be retained within the site archive. It is recommended that these pieces should be conserved for future consultation and if the site warrants publication the leather should be research on any further potential Roman leather working/cobbling activities in this area of Southwark. Also the potential garment fragment or protective sheath should also be researched to identify possible parallels. Although only a few pieces of leather were found they are an important indicator of what trades were present in this area of London.

Context	Description
509	Three square-in-section strips of leather 2mm Breadth & width, lengths between 45-56mm. Either trimming waste or sandal thong.
514	Two flesh opposing sides from the lobed quarter of a one-piece sandal 4mm thick, 9mm in length and between 39-19mm in width. One torn side and two conjoining angled cuts indicating cobblers waste.

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APPENDIX 12 TIMBER ASSESSMENT

Damian Goodburn

The woodwork discussed here derives from waterlogged cut features and peaty deposits provisionally dated to the Roman period. These notes result from examining the woodwork off site and a review of the site records, plans, timber and other context sheets and *in situ* site photos. The recording carried out was broadly commensurate with the waterlogged wood guidelines issued by English Heritage.

Large partly decayed timber [618]

On close examination this timber was found to have been a very decayed boxed heart oak beam offcut. It had originally been cut off the end of an axe hewn beam c.420 x 260mm and was 1.17m long as found (original dimensions would have been greater). It was found in a pit and lying on-face, and had almost certainly been used as a large post pad, as found at the London amphitheatre and several other Roman London sites. One end of the beam section was axe cross cut and may have been the original felled end. The pith was rather decayed and there were several splits along the rays but a dendrochronology sample was sliced which had c.70 annual rings, showing that the parent tree was of medium growth rate and that it was viable for dating. The presence of sapwood was hard to see due to decay.

The small 'wood' items

A box containing ten small bags labelled ' wood' were opened and examined in good light and brief notes made. Only two bags-actually contained worked wood. This came from context [514] <24>, which produced a small tapered oak plank off-cut with sawn ends, and context [509], which had two decayed oak wood chips. The other bags contained compressed fragments of peat, lumps of charcoal, bark fragments and a human bone (see below). The plank off-cut and bone were retained and the rest discarded.

Further work

This assemblage does not warrant future work, except for the tree-ring analysis of the beam sample [618]. The question of what the post pad beam off-cut had supported needs to be considered.

APPENDIX 13 DENDROCHRONOLOGY

Ian Tyers

A single badly eroded oak sample was provided from this site, context [618].

Methodology

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

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

The tree-ring analysis initially dates the rings present in the timber. The interpretation of these dates relies upon the nature of the final rings in the sequence. Oak timber contains 2 types of wood, heartwood and sapwood, the latter is on the outside of the tree and thus contains the most recent growth rings, this material is softer and is not always preserved under archaeological conditions. If the sample ends in the heartwood of the original tree, a *terminus post quem* (*tpq*) date for the felling of the tree is indicated by the date of the last ring plus the addition of the minimum expected number of sapwood rings which are missing. This *tpq* may be many decades prior to the actual date that a tree was felled, particularly where poor preservation or other loss of outer heartwood has occurred. Where some of the outer sapwood or the heartwood/sapwood boundary survives on the sample, a date range for the felling of a tree can be calculated by using the maximum and minimum number of sapwood rings likely to have been present. For this material the sapwood estimates used are a minimum of 10

and maximum of 46 annual rings, where these figures indicate the 95% confidence limits of the range.

Identifications of wood type are based on the taking of thin sections of the timber in three planes (radial, transverse and tangential sections). The microscopic comparison of these sections with reference slides, or by identification keys, enables secure identification to be made.

Archaeological samples may have problems of degradation during their burial, or even during their storage prior to identification, this may lead to the loss of one or more critical features that prevent any identification being made.

A hand cut thin section was obtained from the samples. This section was placed on a glass slide and examined at between 40x and 1000x magnification. Comparison with permanent reference slides confirmed the identification given below. The temporary slide and sample were then discarded.

Results

The result indicates it is probably a Roman timber that has lost a significant number of its outermost rings through erosion.

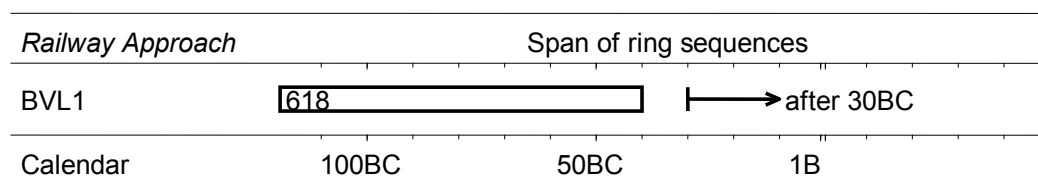


Figure 1. Bar diagram showing the dating position of the oak tree-ring sample from Railway Approach (BVL10). Interpretation using a 10 ring minimum sapwood estimate is also shown. Oak heartwood (white bar).

Context	Rings	Sap rings	Date of measured sequence	Interpreted result
618	80	-	119BC-40BC	after 30BC

Table 1. Details of the oak (*Quercus* spp.) sample. Interpretation using a 10 ring minimum sapwood estimate.

London, Arthur St AUT01 (Tyers 2002)	5.44
London, Drapers Gdns DGT06 (Tyers 2008)	6.13
London, Guildhall Yard GAG87 (Tyers 2001)	5.03

London, Guildhall Yard GYE92 (Tyers 2001)	5.11
London, Poultry ONE94 (Tyers 2000)	5.65
London, Pudding Lane PDN81 (Hillam pers comm.)	5.06
London, Regis House KWS94 (Tyers 1995; Tyers & Boswijk 1996)	5.14
London, Southwark Tabard Sq LLS02 (Tyers 2009)	6.28

Table 2. Showing example t values (Baillie & Pilcher 1973) between the sequence from sample 618 and 8 independent site series.

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APPENDIX 14 CHARCOAL & MACROFOSSILS ASSESSMENT

John Giorgi

Introduction

During archaeological excavations at Thameslink Vaults 2 and 5, Railway Approach, Southwark, environmental bulk soil samples were collected for the potential recovery of biological materials including macro-plant remains. The following report is concerned with the assessment of the charred and waterlogged botanical material in these samples and the potential information that these remains may provide on economic/human activities in the area and possibly the character of the local environment. The samples were also assessed for the presence of identifiable charcoal fragments and insect remains.

Sampling, recovery and identification methods

Nineteen environmental bulk samples from different contexts were selected for assessment with a breakdown by location as follows: Vault 2 North (four samples), Vault 2 South (eight samples), Vault 5 North (two samples) and Vault 5 South (five samples). The samples were collected mainly from pit fills (seven samples) and organic layers (four samples), with two samples each from dump/levelling deposits, burnt horizons and mortar surfaces, and single samples from the fills of a ditch and a posthole. Provisional dating of the sampled features shows that the majority (11) of the samples are from the Roman period (phases 3a-c). Two samples were tentatively dated to the prehistoric period (phase 2a), five samples are assigned to the prehistoric/early Roman period (phase 2b) and one sample to the post-Roman period (phase 4).

The volume of individual soil samples ranged from three to 38 litres although the majority were between ten and 30 litres. Part of the soil (between three and 30 litres) from 17 samples was processed for the recovery of charred plant remains by flotation, using mesh sizes of 0.25mm and 0.5mm for the recovery of the flot and residue respectively. One litre sub-samples from eight contexts were separately processed for the retrieval of waterlogged organic material by 'washover' onto a 0.25mm mesh followed by wet-sieving of the residue also through a 0.25mm sieve. Wet and dry flots were produced for six samples. Processing details for individual samples showing volumes of processed and unprocessed soil (in eight samples) are presented in Table 1.

There was insufficient time for the complete sorting of the residues although large charcoal and waterlogged wood fragments were removed, while the presence of mineralized plant remains in sample 31 from Roman pit fill [609] was noted and a subsample (1/6th) extracted for assessment. While it is possible that additional botanical material still requires sorting from the residues, the quantity and quality of the plant remains in the wet and dry flots provides an adequate indication as to the botanical potential of the sampled features. The dried flots measured between 4ml and 600ml

(although almost half were in excess of 250ml) while the wet flots ranged in size from 15 to 100ml. The flots were divided into fractions using a stack of sieves for ease of assessment and scanned using a stereo-binocular microscope, with a magnification of up to x40. Sub-samples of between 5% and 50% were taken for assessment from the smaller fractions (below 1mm) from the eleven largest flots. Individual flot sizes are shown in Table 1.

The presence and abundance of charred plant remains (grain, cereal chaff, wild plants/weed seeds, nutshell etc) was recorded, along with the frequency of charcoal fragments larger and smaller than 2mm, the larger pieces being potentially identifiable and suitable for analysis. The abundance of waterlogged botanical material was also noted, these remains predominantly consisting of fragmented wood and seeds and fruits. A record was also made of the frequency of other biological materials in the flots, which included bones, molluscs and insect (beetle, pupae) remains.

The item frequency of all biological remains was scored using the following scale: + = <5 items; ++ = 5-25 items; +++ = 26-100 items; ++++ = 101-300 items; +++++ = >300 items. Recommendations for analysis was based on the size of the individual plant assemblages (a combination of the charred and 'waterlogged' material) in terms of the number of identifiable items, with the following codes being used to define their potential: A = rich assemblages (containing more than 300 identifiable items); B = good assemblages (100-300 identifiable items); C = moderately good assemblages (50-100 identifiable items); D = poor assemblages (less than 50 and usually less than ten items); and F (unproductive flots with no identifiable plant material). Provisional identification of the botanical remains was carried out during assessment although without direct comparison to reference material and seed reference manuals. Nomenclature follows Stace (1997).

There follows a general discussion of the results and then a breakdown by period and location, followed by an assessment of potential and recommendations for further analysis, based on the quantity and quality of the individual botanical assemblages.

Results

The flot assessment results are presented by period/phase in Table 1, which shows the frequency of the different biological remains in each flot and comments on individual sample assemblages, including provisional identifications of some of the plant materials. Waterlogged remains were the predominant feature of many of the botanical assemblages, consisting mainly of fragmented wood and seeds, largely from wild plants/weeds, with organic preservation not appearing to extend to the survival of more fragile botanical material. There were large quantities of charcoal in a number of samples but other charred plant remains (grain, chaff, and wild plant/weed seeds) were poorly represented.

Charred plant remains

Identifiable charred plant remains consisted mainly of traces or very small numbers of poorly preserved cereal grains in 11 samples from all four locations, with the better preserved material showing the occasional presence of *Triticum spelta* (spelt wheat), *T. dicoccum/spelta* (emmer/spelt wheat), *T. aestivum* type (free-threshing wheat) and *Hordeum vulgare* (hulled six-row barley). A possible *Avena* (oat) grain was noted in one sample. Traces of cereal chaff (*Triticum* glume base) were present in one sample, a few wild plants/weed seeds (*Ranunculus* sp. (buttercup), *Vicia/Lathyrus* (vetch/tare/vetchling), Poaceae (grasses)) in two flots, and *Corylus avellana* (hazelnut) shell in another sample. The best assemblages, albeit only represented by small amounts of material, were in prehistoric/early Roman organic layer [516] (sample 27) and Roman pit fill [511] (sample 21) (both in Vault 2 North) and burnt layer [162] (sample 4) (in Vault 5 North).

Charcoal

Potentially identifiable charcoal (including roundwood) was present in virtually all (18 of the 19) the sampled features, with a number of flots containing large fragments (greater than 10mm). The largest charcoal assemblages were in the following contexts: prehistoric/early Roman layer [516] (sample 27) (Vault 2 North); Roman pit fills [606] (sample 30) (Vault 2 South), [511] (sample 21) (Vault 2 North), [333] (sample 5) (Vault 5 South); mortar surfaces [334] (sample 6) (Vault 5 South) and [514] (sample 23) (Vault 2 North); and dump/levelling deposit [509] (sample 22) (Vault 2 North).

Waterlogged plant remains

Waterlogged plant remains were present in 16 of the 19 samples in both dry and wet flots and particularly in sampled features from Vault 2 North and South, with the material generally consisting of fragmented wood together with seeds from predominantly wild plants/weeds. There was less evidence for the residues of plants used as food and other human activities. The richest assemblages in terms of item frequency and species diversity were from the following ten contexts (all from Vault 2 North and South); prehistoric/early Roman organic layers [516] (sample 27) (Vault 2 North), [615] (sample 33), [621] (sample 36), [620] (sample 37); Roman pit fills [606] (sample 30), [609] (sample 31), [613] (sample 32), [617] (sample 34) (all Vault 2 South); dump/levelling deposit [509] (sample 22); and mortar surface [514] (sample 23) (both Vault 2 North). Five of these samples (22, 23, 27, 33, 36) contained rich numbers of seeds from both dry and wet flots. These assemblages also contained large amounts of wood (including roundwood), particularly in the prehistoric/early Roman organic deposits (samples 27, 33, 36, 37, 30) with fragments greater than 10mm and up to 90mm. Occasional and small amounts of moss (except for a moderate amount in [514] (sample 23)) were present in just over half of the flots. The following discussion also includes mineralized seeds from a Roman pit fill [609].

Plant foods were represented mainly by fruit remains, with definite cultivars including *Ficus carica* (fig), seeds of which were noted in eight samples, and mineralized *Vitis vinifera* (grape) seeds from Roman pit fill [609] (sample 31); this sample also contained calcified seed remains possibly of

Malus/Pyrus (apple/pear) and numerous Rosaceae (*Prunus*) fruit stones. Occasional *Juglans regia* (walnut) shell fragments were noted in Roman mortar surface [514] (sample 23), while hazel nut shell along with fruit stones of *Prunus spinosa* (sloe/blackthorn), *P. avium* (cherry) and *Sambucus* (elder) and *Rubus* (blackberry/raspberry) seeds, may represent the residues of collected wild fruit. There were also interesting finds of *Coriandrum sativum* (coriander) in prehistoric/early Roman organic layer [621] (sample 36) and possible *Cannabis sativa* (hemp) in a similarly dated organic layer [516] (sample 27). Some of the other wild plants in the samples, for example *Papaver somniferum* (opium poppy) seeds, may have also been used as food.

The majority of the waterlogged seeds, however, were from species associated with a wide range of habitats (often more than one), with plants of disturbed (including cultivated) ground and waste places and wetland environments being particularly well represented. Common weeds were *Urtica urens* (small nettle), *U. dioica* (common nettle), *Atriplex/Chenopodium* spp. (oraches/goosefoots etc.), *Rumex* spp. (docks), *Fallopia convolvulus* (black bindweed), *Stellaria media* (chickweeds), *Polygonum aviculare* (knotgrass), *Persicaria lapathifolia* (pale persicaria), *P. maculosa* (redshank) and *Solanum nigrum* (black nightshade). A good range of wetland plants included both aquatic and bankside/marshland taxa, for example, *Ranunculus Batrachium* (crowfoots), *Alisma* sp. (water plantain), *Oenanthe* sp. (water dropworts), *Ranunculus flammula* (lesser spearwort), *Sparganium erectum* (branched bur-reed), *Eleocharis* sp. (spike-rushes), *Carex* sp. (sedge) and *Juncus* sp. (rushes). The last three plants may also indicate grassland habitats along with other species such as *Prunella vulgaris* (self-heal), *Ranunculus acris/repens/bulbosus* (buttercups) and various indeterminate grass (Poaceae) seeds. Some of the wild fruit remains listed above may also be indicative of woodland/hedgerow/scrub vegetation.

Other biological material

Faunal remains in the samples included insect remains in 14 samples, mainly beetle fragments and occasional (mineralized) pupae. A rich insect assemblage was present in Roman mortar surface [514] (sample 23) (Vault 2 North) with moderate numbers of beetle fragments in the waterlogged subsamples from prehistoric/early Roman organic layers [516] (sample 27) (Vault 2 North), [615] (sample 33), [621] (sample 36), [620] (sample 37) and Roman pit fill [613] (sample 32) all from Vault 2 South. Small amounts of fragmented bone (some burnt) were recovered from 16 samples and included large and small mammal and bird bone remains and fish (vertebrae). Molluscan remains were noted in 11 samples consisting mainly of very small amounts of very fragmented oyster shell, for example in Roman pit fill [331] (sample 5), possibly food refuse.

Results by phase and location

?Prehistoric (Phase 2a)

Vault 5 South

Two samples from pit fill [338] (sample 7) and ditch fill [340] (sample 8) produced very few identifiable plant remains except for a poorly preserved grain in the pit fill and small amounts of potentially identifiable charcoal fragments in both flots.

Prehistoric/early Roman (Phase 2b)

Vault 2 North

Sample 27 from organic layer [516] (both wet and dry flots) contained occasional evidence for the residues of food/economic plants (charred grain, cultivated and wild fruits including fig, and possibly hemp) although the majority of the waterlogged seeds were from wild plants/weeds associated particularly with disturbed/waste ground and wetland environments. There was also a large quantity of potentially identifiable charcoal, and in the wet flot a moderate amount of beetle fragments.

Vault 2 South

The three organic layers [615] (sample 33), [620] (sample 37), and [621] (sample 36) (two with both wet and dry flots) produced similar botanical assemblages, with mainly fragmented wood (some large fragments), a moderate amount of identifiable charcoal, and traces of evidence for a few plant foods (occasional grain, fig, wild fruits, coriander). Most of the numerous waterlogged seeds, however, were again from disturbed/waste ground and wetland plants. Moderate quantities of beetle fragments were present in all three samples. The dry flot from dump/levelling deposit [619] (sample 35) contained mainly charcoal (with potentially identifiable fragments) and few other identifiable plant remains other than occasional charred grain, fig and weed seeds.

Roman (Phase 3a)

Vault 2 South

Four samples (three dry, one wet flot), from pit fills ([606] (sample 30), [609] (sample 31), [613] (sample 32) and [617] (sample 34), contained similar botanical assemblages. Again, there was only limited evidence for plant foods, mainly occasional grains and fig seeds in two fills and wild fruit remains in several samples, although pit fill [609] contained mineralized fruit remains of grape, possibly fig, apple/pear and *Prunus* fruit species. Three of the fills produced moderately rich waterlogged seed assemblages, predominantly remains from disturbed/waste ground and wetland species. There was identifiable charcoal in all samples but particularly in pit fill [606] (also containing a large amount of wood), while there was a large amount of wood in the two fills [613] and [617] from pit [614]. There was a moderate amount of beetle fragments in the one wet flot from fill [613].

Roman (Phase 3b)

Vault 2 North

Two samples (both with wet and dry flots) were assessed from a dump/levelling deposit [509] (sample 22) and a mortar surface [514] (sample 23), with the botanical assemblages in both consisting predominantly of wood and charcoal (including a large number of identifiable fragments). There was occasional evidence for plant foods, with traces of charred grain, fig seeds and wild fruit remains, with the mortar layer also containing walnut shell fragments. The moderately rich waterlogged seed assemblages included evidence again mainly from disturbed/waste ground and wetland species but also seeds of grassland plants, some of which may have been collected and used as flooring/bedding materials or possibly fodder. The wet flot from the mortar layer also contained a fairly large number of beetle fragments.

Vault 5 North

A small dry flot from a burnt horizon [162] (sample 4) produced only a small amount of charcoal (with some identifiable fragments) and a few charred grains.

Vault 5 South

A large (370ml) dry flot from a mortar surface [334] (sample 6) consisted virtually entirely of charcoal, with a very large number of identifiable fragments but no other botanical remains.

Roman (Phase 3c)

Vault 2 North

Sample 21 from pit fill [511] (with wet and dry flots) consisted mainly of charcoal (with a large number of identifiable fragments) and some wood in the wet flot. There were a small number of charred grains, weed seeds and evidence for fig, while a few wild fruit remains may represent food refuse. There were few other waterlogged wild plants/weed seeds in either flot other than from occasional wetland species.

Vault 5 North

A small dry flot from a posthole fill [156] (sample 1) contained mainly charcoal with a moderate number of identifiable fragments but virtually no other botanical remains.

Vault 5 South

Sample 5 from pit fill [333] produced a fairly large flot mainly with charcoal and a large number of identifiable fragments but no other botanical material.

Post-Roman (Phase 4)

Vault 5 South

The botanical remains in the one sample (2) from a post-Roman burnt horizon [320] consisted predominantly of charcoal with a moderate number of identifiable fragments together with occasional charred grain and a few waterlogged seeds (from wild fruits and wetland species).

Summary and potential of the biological remains

An overview of the assessment results shows that the rich identifiable botanical assemblages (predominantly containing waterlogged remains) were all from samples associated with Vault 2 North and Vault 2 South while the two Vault 5 locations produced relatively little waterlogged material but mainly charcoal and occasional charred grains. Preliminary assessment of the rich waterlogged assemblages revealed no significant differences in the botanical composition between the different sampled features.

The charred plant remains

Just over half of the samples contained identifiable charred plant remains, with only occasional or very small amounts of charred and often poorly preserved cereal grain in 11 samples, traces of cereal chaff in one sample, hazelnut shell in another and a few wild plant/weed seeds in two flots. Cereals included hulled (spelt) wheat, free-threshing wheat and six-row hulled barley, although the paucity of remains does not allow any comment on the relative importance of these grains. Spelt wheat, with smaller amounts of free-threshing wheat and hulled barley, are the main cereals found on many Roman sites in Southwark but usually only represented by small amounts of grains (Giorgi 2009, 113). The few chaff and weed seeds cannot provide any useful information on crop husbandry and processing. The charred hazelnut shell fragments probably represent food by-products.

Charcoal

Identifiable charcoal was present in virtually all the sampled contexts, with particularly large amounts in seven samples (5, 6, 21, 22, 23, 27 and 30) sample 27 being from phase 2b (prehistoric/early Roman) and the others from phase 3 (Roman period). Identification of this material may establish the range of woods being used at the time although it will be difficult to establish the specific uses (e.g. as fuel, or for construction purposes) of the different species because of the nature of the sampled features from which the charcoal was recovered. Thus, the seven rich charcoal assemblages were from pit fills, mortar surfaces, a dump and an organic layer, while the other contexts containing identifiable charcoal include a ditch fill and burnt horizons; the material in these samples probably represents dumped material or discarded material blowing around the site. An exception may be the charcoal from the post-hole fill [156] if the burnt material in this fill represents the remnants of the post burnt *in situ*.

The waterlogged plant remains

Waterlogged plant assemblages were present in the majority (16) of the samples with all the rich assemblages being from sampled contexts within Vault 2 North and South, with few waterlogged remains in the samples from the Vault 5 locations. The material consisted predominantly of large amounts of fragmented wood and seeds, with little evidence for the survival of more fragile plant remains. The larger wood fragments may be identified to establish the range of species present, although it will again be difficult to establish their use (if any) because of the nature of the sampled features from which the material was recovered. The waterlogged seeds were mainly from wild plants/weeds; there was, however, some evidence for the residues of plant foods in the form of fruits and nuts, both cultivated (fig, grape, possibly apple/pear, walnut) and wild (sloe/blackthorn, cherry, *Prunus* species, elder, blackberry/raspberry, hazelnuts). Fig and grape seeds have frequently been recovered from sites in Roman Southwark while finds of these seeds are ubiquitous on Roman sites in the City (Giorgi 2009, 101); figs and grapes may have been imported as dried fruit although both could have been grown locally. Walnut (previously found in Roman Southwark) may also have been imported as well as home-grown (ibid., 102). Other foodstuffs noted in the assessment were coriander and hemp, the fibres from the latter plant also used for textiles and rope. Thus, detailed analysis of the fruits and seeds within the samples may provide information on diet as well as possibly other economic activities.

The bulk of the waterlogged seed assemblages, however, were from wild plants/weeds associated with a range of habitats, but particularly disturbed and waste ground and wetland environments, although with some evidence for possible areas of grassland and woodland/hedgerow. These remains may provide information on the nature of the local environment within and in the close proximity of these sampled features in Roman Southwark, and any possible differences between the areas (specifically Vault 2 North and South) and between the prehistoric/early Roman (phase 2b) and Roman periods (phase 3b).

There is, however, the problem of differentiating between locally growing wild plants and those imported incidentally or for some specific use, for example, wetland (sedges, rushes) and grassland plants for flooring/building materials etc, or wild fruits remains collected for food from further afield. The nature of the sampled context (and other material within the features) may go some way to addressing this problem; for example, fruit remains in a pit together with other food refuse are probably more likely to be from collected fruit rather than incidentally being deposited there. Previous wild plant/weed seed assemblages from Roman Southwark have also tended to show a high presence of wetland plants reflecting the close proximity of the Thames and the numerous channels running through the area, together with plants from disturbed and waste ground habitats, indicative of human activities (Giorgi 2009, 11).

Other biological remains

Moderately rich insect (beetle) assemblages were present in six samples (mainly from organic layers, plus a pit fill and a mortar surface). These remains may complement the botanical evidence and

provide information on the nature of the local environment within and in the vicinity of the sampled features and on economic/human activities in the area. Unprocessed soil remains from these samples, part of which could be processed by paraffin flotation for the recovery of additional insect remains. Other biological material included poorly preserved small amounts of bone in many of the flots. Most of this is probably unidentifiable, while the very fragmented oyster shell probably simply represents food debris.

Recommendations for the analysis of botanical remains

On the basis of the assessment it is recommended that detailed analysis is carried out on the ten rich waterlogged plant assemblages (all from Vault 2 North and South). This should involve scanning of both the dry as well as the wet flots because the larger amount of soil processed for the dry flots may mean that additional and rarer (economic) species may be recorded (particularly in the larger fractions). Identifiable charred plant remains should also be extracted and quantified, while the wet and dry residues should also be fully sorted for plant remains. The remaining soil from seven of these samples could also be processed in order to potentially increase species range although part of the retained soil could be used for paraffin flotation for the recovery of additional insect remains. A record of the plant remains from the other nine samples should also be made, either using the assessment results and/or by rapid scanning, for use in the general discussion of the botanical evidence. The plant remains may address the following:

- Evidence of diet, including possible imports and exotic foodstuffs
- The use of plants for other economic activities
- The collection and use of wild plants for food and other uses, eg building/flooring materials
- The possible function of the Roman pits on the basis of both the botanical remains and other biological and artefactual data within these features
- The nature of the local environment in this area of Southwark and possible differences between Vault 2 North and South and any changes between the early Roman/prehistoric and Roman periods

There is potentially identifiable charcoal in virtually all the samples with particularly rich assemblages in seven flots although the analysis of this material can only provide general information on the range of woods present at the time but not their specific uses. A charcoal specialist should be consulted as to whether such work should be carried out.

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trench	sample	context	prov. date	phase	feature type	proc. soil vol (l)	unproc. soil (l)	fлот vol (ml)	charcoal		charred		wlg	bone	insect	moll.	PR pot	comments
									>2mm	<2mm	grain	other						
Vault 5 South	7	338	?Prehistoric	2a	Fill of Pit [339]	13	-	4	++	+++++	+			+			D	DRY FLOT; v fragmented charcoal (id'ble) & fine gravel; one grain (<i>Hordeum/Triticum</i> sp.); small mammal bone fragments
Vault 5 South	8	340	?Prehistoric	2a	Fill of Ditch [341]	10	-	30	+++	+++++			+	+		++	F	DRY FLOT; mainly v fragmented charcoal (id'ble) with occ frags 4-10mm, and fine sandy gravel.; occ wlg seeds (<i>Sambucus</i> sp.), oyster flecks & indet small mammal bone
Vault 2 North	27	516	Prehistoric/early Roman	2b	Organic layer	10	9	250	+++++	+++++	++	+	+++++	++	++	++	A	DRY FLOT: mainly charcoal (id'ble) & sediment crumb/gravel; also >v fragmented wood; 5-10 chd grains (<i>Triticum spelta</i> , <i>Hordeum vulgare</i> (6x), <i>Hordeum/Triticum</i> sp.), <i>Triticum</i> sp. glume base; rich w/ seeds (fruits, weeds, wetland spp) (cf <i>Cannabis sativa</i> , <i>Corylus avellana</i> +++ , <i>Ficus carica</i> , <i>Rubus</i> sp., <i>Sambucus</i> sp., <i>Polygonum aviculare</i> , > <i>Polygonum</i> spp., <i>Fallopia convolvulus</i> , <i>Rumex</i> sp., <i>Solanum nigrum</i> , <i>Chenopodium/Atriplex</i> sp., <i>Ranunculus</i> sp., <i>Urtica dioica</i> , <i>U. urens</i> , <i>Papaver somniferum</i> , <i>Carex</i> sp., <i>Oenanthe</i> sp., <i>Ranunculus flammula</i> , <i>Cyperaceae</i> , <i>Eleocharis</i> sp++);

																		occ moss fragments; large mammal &, fish (vertebra) bone; occ beetles & oyster shell fragments; 50% flot<1mm scanned
Vault 2 North	27	516	Prehistori c/ early Roman	2b	Organi c layer	1	9	15	++	++				+++++		+++	A	WET FLOT: > fragmented wood with frags >10mm (including small branch/twig frags); occ charcoal (id'ble); mod rich wl seed assemblage mainly wild plants especially wetland species with occ dist/waste gd and grassland plants; cf <i>Cannabis sativa</i> , <i>Rubus</i> sp., <i>Atriplex/Chenopodium</i> sp., <i>Polygonum aviculare</i> , <i>Rumex</i> sp., <i>R. acetosella</i> , <i>Urtica urens</i> , <i>Stellaria media</i> , <i>Ranunculus</i> sp., <i>Prunella vulgaris</i> , <i>Ranunculus Batrachium</i> , <i>R. flammula</i> , <i>Oenanthe</i> sp., <i>Carex</i> sp., > <i>Eleocharis</i> sp., <i>Juncus</i> sp.; occ moss fragments; mod nos beetle frags; occ pupae; 25% flot<1mm scanned
Vault 2 South	33	615	Prehistori c/ early Roman	2b	Organi c layer	1	6	15	+	++				+++++	+	+++	A	WET FLOT: mainly v fragmented wood (large frags >10mm+++ up to 60mm); occ charcoal (id'ble); mod rich wl seed assemblage mainly wild plants (mainly wetland & dist/waste gd & occ grassland species) <i>Ficus carica</i> , <i>Urtica urens</i> , <i>U dioica</i> , <i>Solanum nigrum</i> , <i>Atriplex/Chenopodium</i> sp., <i>Polygonum aviculare</i> , <i>Stellaria media</i> , <i>Ranunculus</i> sp., <i>Prunella vulgaris</i> , <i>Sonchus</i> sp., <i>Carex</i> sp., <i>Eleocharis</i> sp., <i>Juncus</i> sp., <i>R. Batrachium</i> ; roots/stem fragments; moderate nos beetle frags; occ pupae; occ bone; 25% flot<1mm scanned

Vault 2 South	33	615	Prehistori c/ early Roman	2b	Organi c layer	10	6	280	+++	++++	+				+++++	++	++	++	A	DRY FLOT: Mainly fragmented wood; >wl seeds (fruits,weeds,wetland plants) <i>Prunus</i> sp. fragments, <i>Ficus carica</i> , <i>Rubus</i> sp., <i>Corylus avellana</i> (whole), <i>Stellaria media</i> , > <i>Polygonum/Persicaria</i> species., <i>Urtica dioica</i> , <i>U. urens</i> , <i>Solanum nigrum</i> , <i>Atriplex/Chenopodium</i> sp., <i>Ranunculus</i> sp.,cf. <i>Beta vulgaris</i> spp <i>maritima</i> , <i>Sparganium erectum</i> , <i>Carex</i> sp., <i>Eleocharis</i> sp., <i>R. Batrachium</i> , <i>R flammula</i> , <i>Conium maculatum</i> , Cyperaceae; occ moss; occ chd grain (<i>Triticum dicoccum/spelta</i>); occ small & large mammal bone (occ burnt); occ beetles & oyster shell frags; 25% flot<1mm scanned
Vault 2 South	36	621	Prehistori c/ early Roman	2b	Organi c layer	7	10	245	++++	++++	+				+++++	+++	++	+	A	DRY FLOT: Mainly fragmented wood & some charcoal (id'ble) (some gravel/sediment crumb); Rich wl seeds (mainly dist/waste gd &,wetland plants)(<i>Coriandrum sativum</i> , <i>Sambucus</i> sp., <i>Rubus</i> sp., <i>Stellaria media</i> , <i>Polygonum aviculare</i> , other <i>Polygonum</i> species, <i>Urtica urens</i> , <i>Solanum nigrum</i> , <i>Sonchus</i> sp., <i>Atriplex/Chenopodium</i> sp., <i>Rumex</i> sp., <i>Brassica</i> sp., <i>Ranunculus</i> sp., cf. <i>Beta vulgaris</i> spp <i>maritima</i> , <i>Carex</i> sp., <i>Eleocharis</i> sp., <i>Conium maculatum</i> , <i>Alisma</i> sp., <i>Mentha</i> sp; occ small, large mammal & fish bone; occ beetles, pupae, freshwater snails & oyster shell frags; 50% flot<1mm scanned
Vault	36	621	Prehistori	2b	Organi	1	10	100	++	+++					+++++		++++		A	WET FLOT: mainly fragmented wood with large

2 South			c/ early Roman		c layer														frags/small twigs >10mm+++ up to 90mm); some charcoal (id'ble) & fine sediment crumb; rich wl seed assemblage virtually all wild plants (mainly dist/waste gd & wetland species) <i>Rubus</i> sp., <i>Sambucus</i> sp., <i>Urtica urens</i> , <i>Solanum nigrum</i> , <i>Rumex</i> sp., <i>Atriplex/Chenopodium</i> sp., <i>Polygonum aviculare</i> , <i>P. lapathifolium</i> , <i>P. persicaria</i> , <i>Stellaria media</i> , <i>Ranunculus</i> sp., <i>Sonchus</i> sp., <i>Plantago major</i> , Poaceae, <i>Carex</i> sp., <i>Eleocharis</i> sp., <i>Juncus</i> sp., moss fragments; moderate nos beetle frags; occ pupae; 5-10% flot<1mm scanned
Vault 2 South	37	620	Prehistori c/ early Roman	2b	Organi c layer	1	3	80	+++	+++		+++++	++++			A	WET FLOT: mainly fragmented wood (incl. twigs); some charcoal (id'ble) & fine sediment crumb; rich wl seed assemblage virtually all wild plants (mainly dist/waste gd, some wetland/grassland plants) <i>Corylus avellana</i> fragments, <i>Rubus</i> sp., <i>Sambucus</i> sp., <i>Urtica urens</i> , <i>Solanum nigrum</i> , <i>Rumex</i> sp., <i>Atriplex/Chenopodium</i> sp., <i>Polygonum aviculare</i> , <i>Stellaria media</i> , <i>Ranunculus</i> sp., <i>S. gramineae</i> , <i>Plantago major</i> , Poaceae, <i>Carex</i> sp., <i>Eleocharis</i> sp.; moss & stem fragments; moderate nos beetle frags; occ pupae; 25% flot<1mm scanned		
Vault 2 South	35	619	Prehistori c/ early Roman	2b	Dump/ levellin g	5	-	41	++++	++++ +	+	++	++	+		D	DRY FLOT; mainly charcoal (id'ble) & fine sediment crumb;occ chd grain (6x <i>Hordeum vulgare</i>); small nos wlg seeds (<i>Ficus carica</i> , <i>Sambucus</i> sp., <i>Atriplex</i> sp., <i>Fragaria/Potentilla</i> sp., <i>Urtica urens</i> , <i>Carex</i> sp.); small, large mammal bone & fish vetebra; occ beetle fragments		

Vault 2 South	30	606	Roman	3a	Fill of Pit [607]	13	-	200	+++++	++++ +	+	+	++++	+++	+	++	A	DRY FLOT: mainly charcoal (id'ble) & sediment crumb/gravel;occ chd grain (<i>Hordeum/Triticum</i> sp.), cf <i>Ranunculus</i> sp.; >wood frags >10mm++ up to 45mm (including small twigs); mod wl seeds (fruits, weeds, wetland spp) (<i>Corylus avellana</i> , <i>Prunus spinosa</i> , <i>P. avium</i> , <i>Sambucus</i> sp., <i>Polygonum aviculare</i> , <i>Rumex</i> sp., <i>Solanum nigrum</i> , <i>Stellaria media</i> , <i>Atriplex</i> sp., <i>Ranunculus</i> sp., <i>Eleocharis</i> sp++); large, small mammal, bird, fish bone; occ beetles; oyster shell fragments; 50% flot<1mm scanned;
Vault 2 South	31	609	Roman	3a	Fill of Pit [610]	20	-	15		++++ +	+	+	++++*	++	+		B	DRY FLOT; mainly charcoal flecks & little fine gravel; occ chd grains (<i>Triticum aestivum</i> , cf <i>Triticum</i> sp.) chd <i>Corylus avellana</i> frags; small nos wlg seeds (<i>Rubus</i> sp+., <i>Sambucus</i> sp., <i>Polygonum aviculare</i> , <i>Atriplex</i> sp., <i>Carex</i> sp.); mod nos min fruit remains from residue (1/6 th sorted) Rosaceae fruit stones including <i>Prunus</i> sp., <i>Vitis vinifera</i> , cf <i>Ficus carica</i> , cf <i>Malus/Pyrus</i> sp., small mammal bone & fish vetebra; occ beetle & min pupae.
Vault 2 South	32	613	Roman	3a	Fill of Pit [614]	1	6	30	+++	++++ +			+++++		+++		A	WET FLOT: v fragmented wood, charcoal (id'ble) & fine sediment crumb/gravel; rich wl seed assemblage mainly wild plants (mainly dist/waste gd & wetland species); <i>Rubus</i> sp., <i>Sambucus</i> sp., <i>Urtica urens</i> , <i>Solanum nigrum</i> , <i>Atriplex/Chenopodium</i> sp., <i>Polygonum aviculare</i> , <i>P lapathifolium</i> , <i>P. persicaria</i> , <i>Stellaria media</i> , <i>Ranunculus</i> sp., Poaceae, <i>Carex</i> sp., <i>Eleocharis</i> sp., <i>Juncus</i> sp.; occ

																		moss fragments; moderate nos beetle frags; occ pupae; 25% flot<1mm scanned
Vault 2 South	34	617	Roman	3a	Fill of Pit [614]	10	-	280	++++	++++			+++++	+++	++	+	A	DRY FLOT: Mainly v fragmented wood, moderate charcoal (id'ble), some sediment crumb/gravel; mod rich w/ seeds (mainly disturbed/waste gd & wetland plants)(<i>Ficus carica</i> , <i>Rubus</i> sp., <i>Corylus avellana</i> , <i>Stellaria media</i> , <i>Polygonum aviculare</i> , > <i>Polygonum/Persicaria</i> species., <i>Urtica dioica</i> , <i>U urens</i> , <i>Solanum nigrum</i> , <i>Atriplex/Chenopodium</i> sp., <i>Ranunculus</i> sp., <i>Sonchus</i> sp., <i>Rumex</i> sp., <i>Papaver somniferum</i> , cf. <i>Beta vulgaris</i> spp <i>maritima</i> , <i>Sparganium erectum</i> , <i>Carex</i> sp., <i>Eleocharis</i> sp., <i>R. flammula</i> , occ moss; large mammal bone frags; occ beetles & oyster shell frags; 25% flot<1mm scanned
Vault 2 North	22	509	Roman	3b	dump/ levellin g	5	8	335	+++++	++++ +	+		+++++	+	+		A	DRY FLOT: mainly fragmented wood & charcoal; occ chd grain (<i>Hordeum vulgare</i> , cf. <i>Triticum</i> sp.); mod rich w/ seeds (fruits, occ disturbed/waste gd, wetland & grassland spp) (<i>Corylus avellana</i> (whole & frags), <i>Ficus carica</i> ++, <i>Rubus</i> sp., <i>Polygonum aviculare</i> , <i>Rumex</i> sp., <i>Atriplex</i> sp., > <i>Ranunculus acris/repens/bulbosus</i> , <i>Prunella vulgaris</i> , <i>Carex</i> sp., <i>Oenanthe</i> sp., <i>Ranunculus flammula</i> , <i>Eleocharis</i> sp. <i>Juncus</i> sp.); occ moss fragments; occ large mammal bone; occ beetles; 25% flot<1mm scanned

Vault 2 North	22	509	Roman	3b	dump/ levellin g	1	8	50	+++++	++++ +	+							A	WET FLOT: >charcoal (id'ble) & v fragmented wood & gravel/fine sediment crumb; indet chd grain; mod rich wl seed assemblage (mainly wetland plants; occ grassland species); <i>Ficus carica</i> , <i>Rubus</i> sp., <i>Prunella vulgaris</i> , <i>Ranunculus</i> sp., Poaceae, <i>Carex</i> sp., Cyperaceae, <i>Eleocharis</i> sp., <i>Juncus</i> sp.; occ nos moss fragments; occ beetle frags; 25% flot<1mm scanned
Vault 2 North	23	514	Roman	3b	mortar surface	13	10	600	+++++	++++ +	+							A	DRY FLOT: mainly fragmented wood & charcoal; indet chd grain frags; mod rich wl seeds (fruits, disturbed/waste gd, wetland & grassland spp) (<i>Corylus avellana</i> ++, <i>Juglans regia</i> , <i>Prunus avium</i> , <i>Prunus</i> sp., <i>Ficus carica</i> , <i>Sambucus</i> sp., <i>Rubus</i> sp, <i>Polygonum aviculare</i> , other <i>Polygonum</i> spp., <i>Rumex</i> sp., <i>Raphanus raphanistrum</i> , <i>Chenopodium/Atriplex</i> sp., > <i>Ranunculus acris/repens/bulbosus</i> , <i>Prunella vulgaris</i> , <i>Carex</i> sp., <i>Oenanthe</i> sp., <i>R. flammula</i> , <i>Eleocharis</i> sp.); occ moss fragments; large mammal &, fish bone; occ beetles & oyster shell fragments; 25% flot<1mm scanned
Vault 2 North	23	514	Roman	3b	mortar surface	1	10	60	+++	++++ +								A	WET FLOT: mainly fragmented wood; some charcoal (id'ble); rich wl seed assemblage mainly wild plants (fruits, dist/waste gd, wetland & grassland species); <i>Prunus spinosa</i> , <i>Prunus</i> sp., <i>Ficus carica</i> , <i>Rubus</i> sp., <i>Solanum nigrum</i> , <i>Atriplex/Chenopodium</i> sp., <i>Polygonum aviculare</i> , <i>P. lapathifolium</i> , <i>P. persicaria</i> , Apiaceae, Asteraceae, <i>Rumex</i> sp., <i>R. acetosella</i> , <i>Prunella vulgaris</i> ,

																		<i>Ranunculus</i> sp., <i>Poaceae</i> , <i>Carex</i> sp., <i>Eleocharis</i> sp., <i>Juncus</i> sp.; mod nos moss fragments; occ stems; rich nos beetle frags; occ pupae; 25% flot<1mm scanned	
Vault 5 North	4	162	Roman	3b	burnt horizon	7	-	10	+++	++++ +	++		+				D	DRY FLOT; fragmented charcoal (id'ble) (occ frags 10-20mm++) & fine gravel/sediment crumb; c 5-10 fragmented grain (<i>Triticum</i> sp., cf <i>Hordeum</i> sp.); moss fragments	
Vault 5 South	6	334	Roman	3b	mortar surface	25	-	370	+++++	++++ +					++	+	F	DRY FLOT: virtually all fragmented charcoal (>nos id'ble frags with >nos >10mm+++ up to 60cm including small branch frags); occ large & small mammal bone fragments & oyster shell fragments; some chalky mortar/gravel; 25% flot <1mm scanned	
Vault 2 North	21	511	Roman	3c	Fill of Pit [512]	17	10	172	+++++	++++ +	++	+	++		+++	+	D	DRY FLOT; mainly fragmented charcoal (id'ble) with frags 4-10mm+++ & >10mm++ up to 35mm, fine gravel/sediment crumb; v. frag chd grain (mainly indet)(cf <i>Triticum aestivum</i> , <i>Triticum</i> sp., cf <i>Avena</i> sp. & chd seeds (<i>Vicia/Lathyrus</i> sp., <i>Poaceae</i> (small)); occ wlg seeds (<i>Ficus carica</i> , <i>Sambucus</i> sp., <i>Rubus</i> sp., <i>Ranunculus</i> sp., <i>Carex</i> sp.); indet large (burnt), small mammal & fish (vetebra) bone; occ oyster shell frags	
Vault 2 North	21	511	Roman	3c	Fill of Pit [512]	1	10	80	+++++	++++ +	+		++++		++	++	+	D	WET FLOT: virtually all charcoal (id'ble) & gravel/fine sediment crumb; occ chd grain (<i>Triticum</i> sp.); some fragmented wood & occ wl seeds (<i>Ranunculus</i> sp., <i>Juncus</i> sp.); occ large (incl. burnt) & small mammal

																		bone frags, insect & oyster shell fragments; 25% flot <1mm scanned
Vault 5 North	1	156	Roman	3c	Fill of Post-hole [157]	3	-	24	+++	++++ +			+	++			F	DRY FLOT; fragmented charcoal (id'ble) with occ frags 10-20mm; sediment crumb & gravel; occ indet large, small mammal & fish bone; occ moss fragments
Vault 5 South	5	333	Roman	3c	Fill of Pit [331]	?30	-	130	++++	++++ +				++		++++	F	DRY FLOT; mainly fragmented charcoal (id'ble) with frags >10mm+++ up to 30mm plus fine sand gravel, oyster flecks/small fragments & indet large mammal bone & fish vertebrae
Vault 5 South	2	320	Post-Roman	4	burnt horizon	7	-	28	++++	++++ +	+		+	++	+	+	D	DRY FLOT; fragmented charcoal (id'ble) with occ frags c 10mm; fine gravel/sediment crumb; occ chd grains (cf <i>Triticum dicoccum/spelta</i> , <i>Triticum</i> sp.); occ wlg seeds (<i>Sambucus</i> sp., <i>Carex</i> sp.) & moss fragments; occ indet large, small mammal & fish bone; occ min pupae; oyster shell frags

Table J.1: Environmental samples: Flot Assessment results

Key:

Frequency of items: + = <5; ++ = 5-25; +++ = 26-100; ++++ = 101-300; +++++ =>300 items

Pot PR (potential of plant assemblages): A = rich (more than 300 identifiable items); B = good (100 to 300 identifiable items); C = moderate (50 to 100 identifiable items); D = poor (less than 50, usually less than 10 items); F (no identifiable charred plant remains)

Wlg = waterlogged plant remains (includes fruits, seeds, wood & moss fragments); Charred other (includes seeds, fruits, nuts, cereal chaff fragments); moll=molluscs

* = includes mineralised plant remains in the residue of [609] sample 31

APPENDIX 15 SHELL ASSESSMENT

Rebecca Nicholson

Introduction

In total, a minimum of 102 complete valves or hinged parts of bivalves (1,506g) were collected from 16 contexts. Of these, 32 valves were retrieved by hand collection while the remaining 70 were extracted from the dried residues (>4mm) of sieved soil samples. The great majority of shells were from the native oyster *Ostrea edulis* L and for this shellfish the left (lower) and right (upper) valves were counted separately. Any encrustation and/or parasite damage to the shells was noted (after Winder 1980). Full records will be deposited with the site archive.

Results

In addition to oyster, several fragments of mussel (*Mytilus edulis* L.) shell were recovered together with a tiny clam, a single fragment of possible carpet shell (cf. *Venerupis* sp.) and a smooth periwinkle (*Littorina* cf. *obtusata*). Shells were in variable condition, but most of the oysters had heavily eroded margins. Several valve edges exhibited small notches which may be related to shellfish opening, but due to the poor condition of the shells this is not confirmed.

The majority of the shells came from Roman features (pit fills and layers) in Vaults 2 and 5, North and South. Pits [331] and [512] (both phase 3c) included concentrations of oyster shell, as did Roman levelling context [509] (phase 3b).

Discussion

In general the oysters were of variable size and shape, suggesting some degree of crowding in the oyster bed. An oyster shell from pit [331] was heavily encrusted with barnacles (*Sessilia*), but in general evidence of parasitic infestation and encrustation was rare. In several cases the remains of smaller valves were evident, fused to the external surface of a host left valve. This could be evidence of cultivation, since seeding an area with empty shells, on which juvenile oysters (spat) settle, is a well known technique of oyster cultivation. However, with such small numbers of shells to consider, this suggestion cannot be substantiated.

Recommendations

Given the small size of this assemblage and the ubiquity of oyster shells in Roman deposits throughout England, no further work on this assemblage is necessary. The assemblage should, however, be considered briefly alongside others from the Thameslink excavations.

Bibliography

Winder, J., 1980. The marine mollusca, in P Holdsworth, Excavations at Melbourne Street, Southampton, 1971-76, Southampton Archaeol Res Comm Rep 1, CBA Res Rep 3, 121-127

Catalogue

Context	Vault	Sample No	No. shells	Weight g	Species	Context	Phase	Phase No	No Left valve	No Right valve
104	5 North	n/a	1	45	oyster	fill of pit 106	Post med	5c	1	
127	5 North	n/a	1	29	oyster	fill of construction cut 128	Post-med	5c		1
162	5 North	4	1	1	oyster	natural				
320	5 South	2	1	1	?carpet shell (frag)	burnt horizon	Post Roman	4		
320	5 South	2	2	1	oyster	burnt horizon	Post Roman	4		
333	5 South	n/a	12	195	oyster	fill of pit 331	Roman	3c	5	7
333	5 South	5	20	359	oyster	fill of pit 331	Roman	3c	10	10
338	5 South	n/a	1	5	oyster	fill of pit 339	Prehistoric/Roman	2a	?1	
509	2 North	n/a	16	325	oyster	dump-levelling	Roman	3b	7	9
509	2 North	22	4	41	oyster	dump-levelling	Roman	3b	3	1
509	2 North	22	1	2	mussel	dump-levelling	Roman	3b		
511	2 North	21	14	252	oyster	fill of pit 512	Roman	3c	10	4
511	2 North	21	2	1	mussel	fill of pit 512	Roman	3c		
511	2 North	21	1	1	Smooth periwinkle	fill of pit 512	Roman	3c		
514	2 North	23	5	82	oyster	mortar surface	Roman	3b	3	2
515	2 North	n/a	1	15	oyster	organic layer	Prehistoric/Roman	2b	1	
516	2 North	27	1	1	mussel	organic layer	Prehistoric/Roman	2b		
516	2 North	27	1	1	clam	organic layer	Prehistoric/Roman	2b		
516	2 North	27	2	8	oyster	organic layer	Prehistoric/Roman	2b		
606	2 South	30	3	9	mussel	fill of pit 607	Roman	3a	2	1
606	2 South	30	4	49	oyster	fill of pit 607	Roman	3a	1	3
609	2 South	31	2	42	oyster	fill of pit 610	Roman	3a	2	
609	2 South	31	1	1	mussel	fill of pit 610	Roman	3a		
615	2 South	33	2	2	mussel	organic layer	Prehistoric/Roman	2b		

615	2 South	33	1	12	oyster	organic layer	Prehistoric/Roman	2b		1
617	2 South	34	1	16	oyster	fill of pit 614	Roman	3a	1	
619	2 South	35	1	10	oyster	organic layer	Prehistoric/Roman	2b		

Table 1: List of contexts with marine molluscs

APPENDIX 16 OASIS FORM

OASIS ID: preconst1-138872

Project details

Project name	Archaeological Excavations at Vaults 2, 5 and 9, Railway Approach, London Borough of Southwark
Short description of the project	<p>The archaeological investigations were centred at National Grid Reference TQ 3266 8031 and constitute 'Thameslink Archaeological Assessment #1 - Vaults 2, 5 and 9, Railway Approach'. Archaeological test pits had previously been excavated on site by MoLA (site codes BKV02 and TLK08), whilst archaeological excavations were conducted by OA-PCA within Vault 2 and Vault 5 during 2010, with an archaeological watching brief conducted within Vault 9 during the early part of 2011 (site code BVL10). The investigations encountered the uppermost archaeological horizon between heights of 3.78m OD and 1.75m OD, with a stratified archaeological sequence measuring between 3.20m and 1.70m in thickness recorded beneath. The archaeological sequence comprised a series of stratified Roman deposits, mainly of 1st-2nd century date, deposited above the natural gravel. These included probable mortar floor deposits and other potentially structural features. Mid-late 2nd century deposits contained significant quantities of ceramic and other building material, including tile and stone types derived from a high status building. There was limited evidence for late Roman activity, with no Saxon and medieval deposits present, perhaps as a result of post-medieval truncation. Brick structures of the latter period included a wall and soakaway, a floor and a culvert, mainly associated with deposits of 18th-19th century date.</p>
Project dates	Start: 01-06-2010 End: 28-02-2011
Previous/future work	Yes / No
Any associated project reference codes	BVL10 - Sitecode
Any associated project reference codes	TLK08 - Sitecode
Any associated project reference codes	BKV02 - Sitecode
Type of project	Recording project

Site status	Local Authority Designated Archaeological Area
Current Land use	Other 9 - Subterranean
Current Land use	Other 11 - Thoroughfare
Monument type	ALLUVIUM Roman
Monument type	PITS Roman
Monument type	STRUCTURAL TIMBER Roman
Monument type	DUMP LAYERS Roman
Monument type	MORTAR AND BRICKEARTH SURFACES Roman
Monument type	ROBBER CUTS Early Medieval
Monument type	BRICK SOAKAWAY Post Medieval
Monument type	BRICK WALLS Post Medieval
Monument type	BRICK CULVERT Post Medieval
Monument type	BRICK VAULTS Post Medieval
Significant Finds	POTTERY Roman
Significant Finds	POTTERY Medieval
Significant Finds	POTTERY Post Medieval
Significant Finds	CLAY TOBACCO PIPE Post Medieval
Significant Finds	GLASS Roman
Significant Finds	GLASS Post Medieval

Significant Finds	SMALL FINDS Roman
Significant Finds	SMALL FINDS Medieval
Significant Finds	SMALL FINDS Post Medieval
Significant Finds	BUILDING MATERIALS Roman
Significant Finds	BUILDING MATERIALS Medieval
Significant Finds	BUILDING MATERIALS Post Medieval
Significant Finds	HUMAN BONE Roman
Significant Finds	HUMAN BONE Post Medieval
Significant Finds	ANIMAL BONE Roman
Significant Finds	ANIMAL BONE Post Medieval
Significant Finds	FISH BONE Roman
Significant Finds	TIMBER Roman
Investigation type	"Part Excavation","Watching Brief"
Prompt	Planning condition attached to 'Thameslink - Transport and Works Act Order 2006'

Project location

Country	England
Site location	GREATER LONDON SOUTHWARK SOUTHWARK Thameslink Archaeological Assessment #1: Archaeological Excavations at Vaults 2, 5 and 9, Railway Approach, London Borough of Southwark
Study area	520.00 Square metres
Site coordinates	TQ 3266 8031 51 0 51 30 20 N 000 05 17 W Point

Height OD / Depth Min: 0.09m Max: 0.70m

Project creators

Name of Organisation OA-PCA (Joint Venture)

Project brief originator Network Rail and Southwark Council

Project design originator Dan Poore and Peter Moore

Project director/manager Dan Poore and Peter Moore

Project supervisor Audrey Charvet

Project supervisor Joanna Taylor

Project supervisor Amelia Fairman

Name of sponsor/funding body Network Rail

Project bibliography 1

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