ARCHAEOLOGICAL INVESTIGATIONS AT SEGEDUNUM MUSEUM, BUDDLE STREET, WALLSEND NORTH TYNESIDE, TYNE AND WEAR

March 2016

PRE-CONSTRUCT ARCHAEOLOGY

DOCUMENT VERIFICATION

ARCHAEOLOGICAL INVESTIGATIONS AT SEGEDUNUM MUSEUM, BUDDLE STREET, WALLSEND, NORTH TYNESIDE, TYNE AND WEAR EVALUATION REPORT

Pre-Construct Archaeology Limited Quality Control	
Project Number	K3963
Site Code	SMW15
Report Number	RN11061

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Revision No.	*Date*	*Checked by*	*Approved by*

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Archaeological Investigations at Segedunum Museum, Buddle Street, Wallsend, North Tyneside, Tyne and Wear

Central National Grid Reference: NZ 30109 66045

Site Code: SMW 15

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1. NON-TECHNICAL SUMMARY

1.1 An archaeological evaluation was undertaken April–May 2015 by Pre-Construct Archaeology Limited on land at Segedunum Museum, Wallsend, North Tyneside, Tyne and Wear. The work was carried out to inform the planning authority of the form and depth of any significant archaeological remains to allow a route to be designed for a proposed sewerage main that will minimise the impact on surviving archaeological remains. The work was commissioned by Gardiner & Theobald LLP on behalf of Kier Property.

1.2 The site lies on the north bank of the River Tyne, south of Wallsend and the A187 (Buddle Street), at central National Grid Reference NZ 30109 66045. The proposed scheme of works is to be undertaken within an area occupied by the museum car park to the south and a garden and footpath to the north (the site).

1.3 The site was considered to have high potential for Roman period archaeological remains since it lies immediately to the east of *Segedunum* Roman fort, which has statutory protection under the *Ancient Monuments and Archaeological Areas Act 1979.* The scheduled area of the fort and the site is also incorporated within the Buffer Zone of the Hadrian's Wall component of the transnational *Frontiers of the Roman Empire* World Heritage Site.

1.4 Numerous small scale excavations undertaken in the early 20th century initially highlighted the potential survival of Roman archaeological remains within the area of the fort. Although the area of the Roman fort and its near vicinity was occupied by nineteenth-century terraced housing, extensive excavations undertaken during 1975–85 demonstrated that significant Roman archaeological remains survived here, with this archaeological work broadly identifying the layout of the interior or the fort. Further excavations were undertaken in 1997–1998 with the aim to publically display selected remains of the fort's interior which was previously exposed and to construct a new museum and a reconstruction of the fort bath house.

1.5 The northern area of the proposed works partially lies within an area that was previously excavated as part of the 1997 archaeological works associated with the construction of the museum building. Elements of the outer defensive ditches of the fort and a road or trackway leading to the east gate were encountered in this area.

1.6 The evaluation comprised three machine-excavated trenches (Trenches 1-3). Trench 1 was sited to investigate the location of the proposed manhole and sewerage connections to the Segedunum Museum buildings and to define a safe zone between the fort's outer defensive ditches for the reception pit for trenchless pipe laying, Trench 2 was sited to define a safe zone between the outer defensive ditches for trenchless pipe laying and Trench 3 was sited to identify an appropriate location for the drive pit and proposed manhole.

1.7 Deposits and features encountered within the trenches were placed with four broad phases of activity. The boulder clay 'drift' geological material (Phase 1) was the basal deposit recorded in each trench and generally comprised stiff to firm brownish yellow and reddish brown clay and clayey sand.

1.8 Features and deposits of Roman date (Phase 2) were recorded in Trenches 1 and 2, overlaying the natural clay sub-stratum. In Trench 1 Roman remains were encountered at a depth of *c*. 0.70m below the present ground level. The earliest encountered deposits of Roman date comprised levelling deposits of probable second-century date laid down prior to the establishment of the defensive ditches. A substantial NW-SE aligned ditch truncating the levelling deposits from which third-century pottery was recovered represents the outermost defensive ditch. This ditch had been partially excavated during the 1997 archaeological work and was covered with a breathable membrane prior to its backfilling with sand and stone. In Trench 2 Roman remains were encountered at a depth of *c*. 0.80m below present ground level. Located in the central portion of the trench was a group of four inter-cutting sub-oval features, truncating the natural sub-stratum, which may represent occupation predating the defensive ditches. The postholes were overlain by a sandy clay deposit which was truncated by a NNE-SSW aligned ditch and ditch re-cut, the fills of which both produced second-century pottery. This may represent a field boundary or drainage feature associated with agricultural activity prior to the excavation of the third outer defensive ditch. At the eastern extent of Trench 2 a further element of the outer defensive ditch was partially exposed; this also produced third-century pottery.

1.9 Phase 3 comprises post-medieval remains principally associated with the construction of residential terrace buildings that occupied the site by the late nineteenth century. Building foundations were recorded in Trenches 1 and 2 and levelling and consolidation deposits in all trenches.

1.10 Phase 4 comprises modern activity. Various levelling deposits, structures and service features of modern date were recorded in all trenches. The uppermost deposits recorded in Trenches 2 and 3 were levelling and consolidation deposits and associated surfaces of asphalt forming the museum car park. In Trench 1 the uppermost deposits comprised garden soil and a concrete slab footpath and associated consolidation deposits that formed part of the museums pedestrian access.

1.11 In summary, the evaluation trenches were sited to establish a safe zone between the fort ditches for the proposed sewerage works using a trenchless pipe laying method. Trenches 1 and 3 were sited to establish if archaeological remains of significance survived at the locations of the proposed reception pit to the north, the drive pit to the south and associated manhole locations. Trench 2 was sited specifically to establish the form and depth of any surviving archaeological remains. To this end Trenches 2

and 3 identified Roman period archaeological features and deposits that were considered to be of regional significance. All such archaeological remains were therefore hand excavated and recorded prior to the commencement of the proposed works associated with the new sewerage scheme. No archaeological deposits of significance were identified in Trench 3.

2. INTRODUCTION

2.1 General Background

2.1.1 This report details the methodology and results of an archaeological evaluation undertaken by Pre-Construct Archaeology Limited (PCA) in April–May 2015 on land at Segedunum Museum, Buddle Street, Wallsend, North Tyneside, Tyne and Wear (Figure 1). The work was carried out ahead of a proposed sewerage scheme linking Segedunum museum to a new pumping station being constructed within the former Swan Hunter shipyard with the location of the proposed works within the museum car park and gardens, centred at National Grid Reference NZ 30109 66045. The archaeological work was commissioned by Gardiner & Theobald LLP on behalf of Kier Property.

2.1.2 The high potential for significant archaeological remains for the Roman period being present in this area has previously been established with the proposed works located immediately east of the scheduled area of *Segedunum* Roman fort and within the Buffer Zone of the Hadrian's Wall component of the transnational *Frontiers of the Roman Empire* World heritage Site (Figure 2). The fort itself was extensively excavated in 1975–84 after the demolition of nineteenth-century terraced houses that occupied the site with further excavations undertaken in 1997–1998 associated with the establishment of a visitor centre focused on the Roman fort (Hodgson 2003).

2.1.3 The proposed sewerage works lie partly within an area that had previously been excavated in 1997 as part of the scheme of archaeological works associated with the construction of the museum building. To date the results of the excavation undertaken in this area outside of the east gate of the fort have not been fully published, but an interim statement was provided in the publication detailing the 1997–8 excavation inside the fort (Hodgson 2003, 19–21). At this location elements of the outer defensive ditches of the fort and a road extending north-eastwards from the fort's east gate were identified, with activity dating from the second century to late third–early fourth century.

2.1.4 The work described herein was undertaken according to a Written Scheme of Investigation (WSI) (Amec Foster Wheeler Limited 2015) which was approved by the Tyne and Wear Specialist Conservation Team at Newcastle City Council. The evaluation comprised three machine-excavated trial trenches; all located within the area of the proposed sewerage works within the museum car park to the south and the garden and museum access footpath to the north (Figure 2).

2.1.5 The Site Archive (Site Code: SMW15) is currently held at the Northern Office of PCA and the retained element, comprising the written, drawn and photographic records, as well as a small assemblage of artefactual material, will be deposited with the Tyne and Wear Museums and Archives at Arbeia Roman Fort, South Shields, Tyne and

Wear. The Online Access to the Index of Archaeological Investigations (OASIS) reference number for the project is: preconst1-239092.

2.2 Site Location and Description

2.2.1 The site is located on the north bank of the River Tyne on land at Segedunum Museum, Buddle Street, Wallsend, North Tyneside, Tyne and Wear. The proposed work comprised the installation of a new sewerage services linking Segedunum Museum with a new pumping station being constructed within the former Swan Hunter shipyard to the south. The site is centred at National Grid reference NZ 30109 66045 (Figure 1).

2.2.2 The proposed archaeological evaluation trenches were sited at specific locations within the area between the museum building and the scheduled area of the fort to allow for trenchless pipe laying and to minimise disturbance to surviving archaeological remains. Trench 1 was located for the most part within an area of garden and the museum's pedestrian access footpath to the north and Trenches 2 and 3 were located along the eastern portion of the museum's car park to the south (Figure 2).

2.3 Geology and Topography

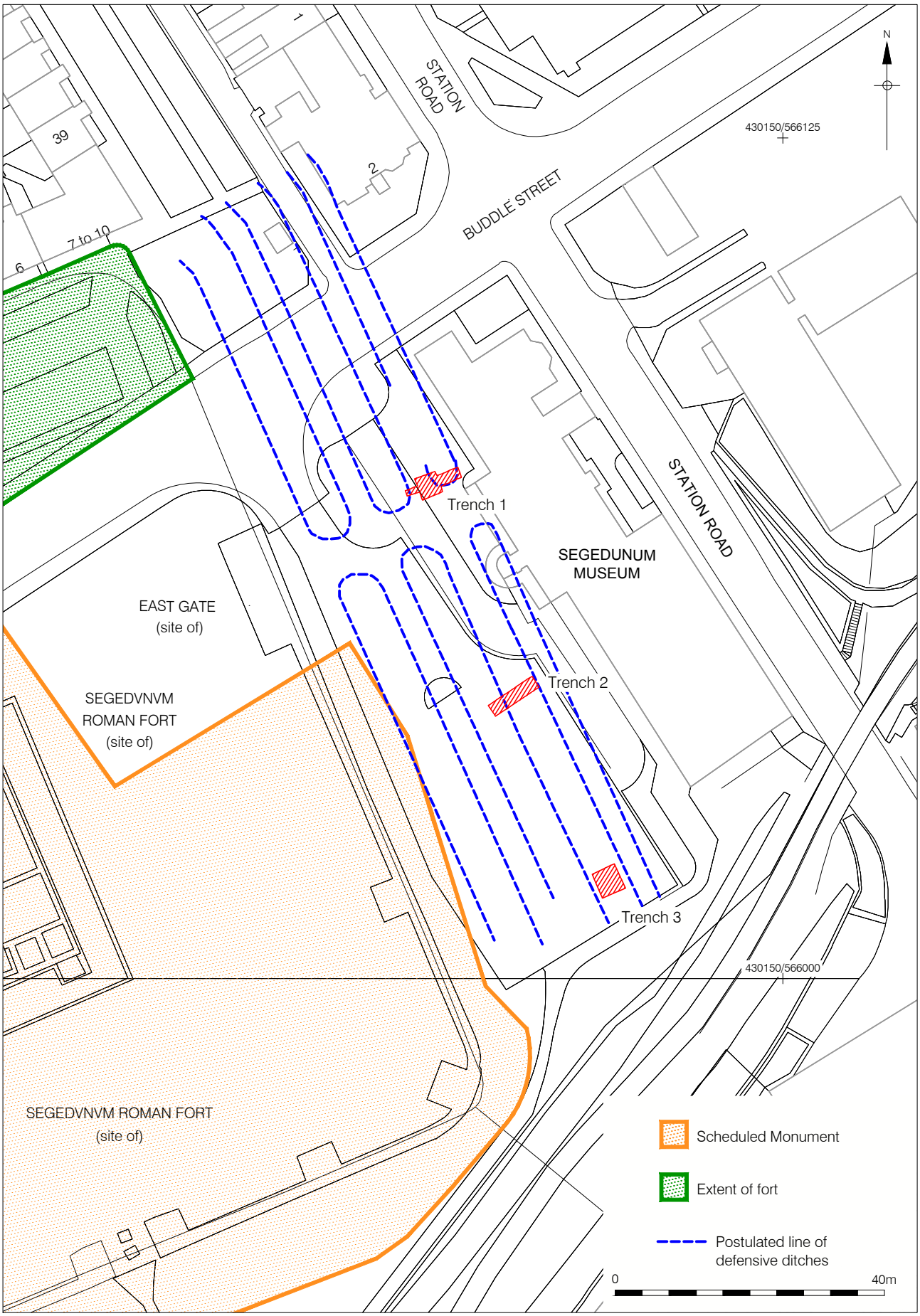
2.3.1 The solid geology of the area of the site comprises sandstone bedrock of the Seventy Fathom Post Member. The drift geology of the area is formed by Pelaw Clay formation (information from the *British Geological Survey* website).

2.3.2 The area of investigation lies on the northern valley side of the River Tyne; the river now lies *c*. 0.3 km to the south-east but the original deep water channel of the River Tyne is thought to have been situated near to the north bank in the Wallsend area, beneath the area formerly occupied by the Swan Hunter site. Groyning works in the early 19th century moved the channel southwards and much of the area developed as the shipyard was reclaimed from the tidal mud flats created by the shifting of the channel.

2.3.3 The topography in the wider area of the site is generally flat with the proposed sewerage works to be undertaken within the area of the museum car park to the south and the garden and museum access footpath to the north. However the ground does slope from north to north reflecting the topography of the northern valley of the River Tyne; present ground level at Trench 1 was recorded at a maximum height of 23.31m OD and at Trench 3 ground level was recorded at a minimum of 21.29m OD.

17/03/16 JS

Figure 1
Site Location
1:2,000,000 & 1:25,000 at A4



17/03/16 JS

Figure 2
Trench Location Plan
1:800 at A4

2.4 Planning Background

2.4.1 The archaeological evaluation was carried out in advance of a sewerage scheme linking Segedunum Museum to a new pumping station being constructed within the former Swan Hunter shipyard. The Tyne and Wear Specialist Conservation Team headed by the County Archaeologist, at Newcastle City Council provides archaeological development control throughout Tyne and Wear. Consultation also took place with the Inspector of Ancient Monuments (Hadrian's Wall) Historic England due to the location of the site.

2.4.2 The site is primarily of archaeological interest for the Roman period with the proposed sewerage works located immediately to the east of the scheduled area of *Segedunum* Roman fort which has statutory protection under the *Ancient Monuments and Archaeological Areas Act 1979* (as amended). Although the proposed sewerage works is located outside of the scheduled area it does lay within the Buffer Zone of the Hadrian's Wall component of the transnational *Frontiers of the Roman Empire* World Heritage Site (WHS). Although the formal WHS status does not extend into the area of the proposed works, archaeological remains of the Roman period within the WHS Buffer Zone relate to the same Roman frontier. It is also worthy of note that the National Planning Policy Framework (NPPF) (Department for Communities and Local Government 2012) makes it clear that non-designated archaeological remains of demonstrably equivalent significance to designated assets should be managed through the planning system as if they were designated (NPPF, paragraph 139).

2.4.3 The requirement to undertake the archaeological investigation is in line with planning policy at a national level, as set out in the *National Planning Policy Framework* (NPPF) (DCLG 2012). The NPPF came into effect in 2012, replacing Planning Policy Statement 5: 'Planning for the Historic Environment' (PPS5), to provide up-dated guidance for LPAs, property owners, developers, *etc*. on the conservation and investigation of the historic environment. Heritage assets - those parts of the historic environment that have significance because of their historic, archaeological, architectural or artistic interest - remain a key concept of the NPPF, retained from PPS5 (despite the deletion of PPS5, the *PPS5 Historic Environment Planning Practice Guide* remains a valid and HM Government endorsed document). Designated heritage assets are those designated under any legislation, for example World Heritage Sites, Scheduled Monuments, Listed Buildings, Conservation Areas, Registered Parks and Gardens, while LPAs are responsible for identifying non-designated heritage assets, these being buildings, monuments, sites, places, areas or landscapes identified as having a degree of significance meriting consideration in planning decisions but which are not formally designated heritage assets.

2.4.4 Chapter 12 of the NPPF 'Conserving and enhancing the historic environment' describes, in paragraph 126, how LPAs should '...*set out in their Local Plan a positive*

strategy for the conservation and enjoyment of the historic environment' and details, in paragraph 128, that 'In determining applications, LPAs should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum, the relevant [Historic Environment Record] *HER should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, LPAs should require developers to submit an appropriate desk-based assessment and where necessary* [the results of] *a field evaluation'*.

2.4.5 North Tyneside Council is currently preparing its Local Development Framework (LDF), which will set out how the city will develop over the next 20 years. The LDF will replace the current Unitary Development Plan (UDP) which was adopted in 2002 and partially amended in 2007. The latter document contains the following relevant policies relating to archaeological remains in 'Chapter 5 – The Environment:

E19

THE LOCAL PLANNING AUTHORITY WILL PROTECT THE SITES AND SETTINGS OF SITES OF ARCHAEOLOGICAL IMPORTANCE FROM DAMAGING DEVELOPMENT; AND WILL SEEK TO ENHANCE THE SETTING AND INTERPRETATION OF SITES OF A RCHAEOLOGICAL IMPORTANCE.

E19/6

WHERE ASSESSMENT AND EVALUATION HAVE ESTABLISHED THAT PROPOSED DEVELOPMENT WILL AFFECT A SITE OR AREA OF ARCHAEOLOGICAL INTEREST THE APPLICANT WILL BE REQUIRED TO PRESERVE ARCHAEOLOGICAL REMAINS IN SITU UNLESS THIS IS CLEARLY INAPPROPRIATE OR DESTRUCTION OF THE REMAINS IS DEMONSTRABLY UNAVOIDABLE, IN WHICH CASE A PROGRAMME OF ARCHAEOLOGICAL WORKS WILL BE REQUIRED TO BE SUBMITTED AND AGREED WITH THE LOCAL PLANNING AUTHORITY BEFORE THE START OF DEVELOPMENT.

2.4.6 A Written Scheme of Investigation (WSI) was produced by Amec Foster Wheeler Environment & Infrastructure UK Limited (Amec Foster Wheeler 2015) and approved by the County Archaeologist and Historic England prior to the commencement of the archaeological evaluation.

2.4.7 The specific aim of the evaluation was, therefore, to inform North Tyneside Council, the County Archaeologist and Historic England about the character, date, extent and degree of survival of any archaeological remains within the location of the proposed

works to allow minimal disturbance and also to inform the future management of the area immediately outside of the scheduled area of the fort.

2.5 Archaeological and Historical Background

Some of the following information is taken from the Swan Hunter Archaeological Evaluation (PCA 2013) and from Sitelines, the online Historic Environment Record (HER) for Tyne and Wear. The work of the individual authors responsible is acknowledged.

Prehistoric

2.5.1 A small assemblage of Late Mesolithic struck flint has been recovered as residual material during excavations undertaken at *Segedunum* fort. A number of pieces had evidently been rejuvenated from earlier struck flakes suggesting that Early Mesolithic or even Late Upper Palaeolithic material was discarded in the area (Waddington in Hodgson 2003, 35).

2.5.2 Excavations undertaken at Wallsend have demonstrated that, prior to the construction of the Roman fort, an extensive area was being used for agricultural activity. Much of the area occupied by the fort was covered with cord-rig cultivation, represented by areas of ridge and furrows and plough marks (Hodgson 2003, 13). Plough marks were recorded running on many different alignments suggesting that the agricultural activity had taken place over a considerable length of time and there was evidence to demonstrate that some of these fields were still in use immediately prior to the building of the fort.

2.5.3 The location of the settlement associated with this recorded agricultural activity remains to be identified, but it is thought most likely to have been situated under the northern part or to the north of the fort.

Roman

2.5.4 The Hadrianic fort of *Segedunum* was situated on an elevated spur of land, which at the time of construction lay at *c*. 29m above sea level and was defined by stream valleys to the east and west (Hodgson 2003, 11). The ground fell away sharply from the southern edge of the fort to the shoreline which in the Roman period, before alteration of the river channel and land reclamation, is estimated to have lain 100m from the south-east corner of the fort and 160m from the south-west corner. The 1.64 acre Hadrianic fort accommodated a cavalry unit and, in the second half of the second century AD, the timber barracks were rebuilt in stone (Hodgson 2009, 69). In the third century AD, the barracks were again rebuilt, their plan rearranged to reflect a major reorganization of the garrison. Little is known of fourth-century AD occupation of the fort as agricultural and industrial activity has resulted in the destruction of much of the upper levels, but it certainly continued to be occupied into the late fourth century AD.

2.5.5 The easternmost section of Hadrian's Wall, running between the south-eastern corner of the fort and the river and generally known as the Branch Wall, was first noted in 1709 by Robert Smith and features in many other antiquarian accounts. These accounts indicate that it was at least 180m long and continued across the foreshore and into the river beyond the low tide mark (Bidwell 2009, 72). The extramural civilian settlement (*vicus*) attached to *Segedunum* fort was located in the area between the fort and the river, to the west of the Branch Wall.

2.5.6 Archaeological work undertaken in 1997 formed an element of the Segedunum Archaeological Project ahead of the construction of the new museum shop, observation tower and café in the area to the east of the fort. The area of archaeological investigation comprised the footprint of the proposed building with extensions to the north, south and west. Trench 1 of the current evaluation lies within the area of the western extension. Four phases of Roman activity were identified during the 1997 excavation including second century agricultural activity (Phase 1), mid to late second century road and associated gully (Phase 2), early third century defensive ditches (Phase 3) and Phase 4 represents the late third–early fourth century backfilling of the defensive ditches and the establishment of a road. The excavations of the area to the east of the fort to date have not been published.

2.5.7 An interim statement on the sequence of the development of the defensive fort ditches was provided in the publication detailing the 1997–8 excavation inside the fort (Hodgson 2003, 19–21). This is based on investigations undertaken in 1929 by the North of England Excavation Committee (Spain *et al.* 1930), in 1977 by Charles Daniels, in 1991 and in 1997. The inner ditch, which was observed in 1929 on all sides of the fort, was *c.* 6.40m wide with an unusually wide berm of *c*. 7m. Excavations in 1997 outside the west gate revealed the inner ditch with a second ditch 2m away which is projected to be 5.20m wide. A third ditch located 1.90m from the second ditch was of smaller proportions being 1.30m wide with a U-shaped profile. The 1997 excavations outside the east gate did not intercept the inner ditch but a 5.20m wide ditch which is presumed to be the second ditch was revealed at a distance of 18m from the fort wall. A third outer ditch at least 4m wide was located 25–27m from the fort wall but as only the terminal was exposed its full width was not established. This outer ditch was constructed during the third century. The alignment of the road leading from the east gate demonstrates that the north portal of the gate was blocked at an early date and at least one building flanked the road in the second century. The main road out of the east gate seems to have been in use in all periods except the mid or later third century when the causeway across the outer ditch was narrowed to 1.50m. By the fourth century the outer two ditches had been infilled and the road was substantial, being at least 12m wide.

2.5.8 Roman activity has been recorded to the north-east of the fort, where excavations in 1993 revealed a series of gullies interpreted as drainage channels or plot boundaries associated with cultivation of the land (Griffiths 1993). Large quarry pits were also encountered in the vicinity. The gullies and pits contained a significant quantity of Roman material dating from the second to early fourth century AD. It is considered most likely that this area of cultivated land was situated to the north of the line of Hadrian's Wall due to the lack of available land in the area to the south; the Tyne ran immediately to the south of the vicus and land to the west of the fort seems to have been occupied by temples (Griffiths 1993, 33). Areas of agricultural land were associated with the frontier forts, so that some supplies could be acquired close at hand.

2.5.9 Also to the north-east of the fort, an evaluation carried out in 2013 revealed a substantial, though horizontally truncated, ditch in trench 8 which was 3.25m wide and was probably aligned east-west (PCA 2013). This potentially represents a roadside ditch situated on the northern side of the road which ran eastwards from the east gate of the fort, or alternatively may represent a field boundary associated with agricultural activity recorded during earlier excavations to the north.

2.5.10 The extramural civilian settlement (*vicus*) attached to *Segedunum* fort was located in the area between the fort and the river, to the west of the Branch Wall. There have been antiquarian accounts of archaeological remains in this area since the eighteenth century. In the first half of the nineteenth century, a bath-house, burials and a possible temple were reported to have been seen in the area immediately to the north-west of the Dry Dock. It is assumed that a riverside landing place or quay would have been located south of the fort (Hodgson 2009, 71).

2.5.11 The scale and nature of the *Segedunum vicus* in the Antonine period are unknown and the one excavated area, located 25m south-west of the fort, did not see development until the late second or early third century AD (Hodgson 2003, 14). By this date there is evidence for intense settlement with closely packed buildings probably fronting onto a road that led south-westwards from the south gate of the fort.

2.5.12 The *vicus* was enclosed in whole or part in the third century by a system of defensive banks and ditches. A north-south aligned rampart and three ditches which led up to Hadrian's Wall 65m west of the fort seems to have been in place by the late second or early third century AD and these are assumed to represent the western side of the *vicus* defences (Hodgson 2003, 15). Investigations in the Swan Hunter site in 2001 revealed lengths of a NE-SW aligned ditch and bank just above the High Water Mark of the Roman period (*ibid*.). Dating evidence from these features demonstrates that the *vicus* was defended along the river bank by the beginning of the third century. Antiquarian accounts also suggest that there was a quay on the foreshore, directly below the south gate or near to the Branch Wall; if this was the case then access

would have been needed through the foreshore defences (*ibid*., 17). Extensive deposits of material, interpreted at the time as Roman midden material, were noted in 1903 within the Swan Hunter site, extending westwards for some 90m from the Branch Wall and similar deposits were noted in 1961 (Speed 2007).

2.5.13 Activity in the *vicus* reached its peak in the mid third century AD when the slope south and west of the fort was densely packed with buildings; the excavated examples probably still fronted onto a road running south-west, possibly to the site of the baths. The south gate of the fort was blocked in the mid third century AD, which meant that there was no direct access at this point from the *vicus* to the fort; the only access point within the defended *vicus* area was via the Minor West Gate.

2.5.14 Like most *vici* on the Wall, the *Segedunum vicus* and its defences were abandoned by the late third century AD. Pottery associated with the abandonment of the defences west of the fort and above the foreshore suggest that this occurred by the AD 270s (Hodgson 2003, 17).

Post-medieval and Post-medieval Industrial

2.5.15 Very little is known about the part of North Tyneside form the period between the end of the Roman occupation and the eighteenth century. The earliest surviving maps demonstrate that by the eighteenth century the location of the fort and the wider riverside area was occupied by open fields.

2.5.16 Wallsend Colliery was established in the late eighteenth century with an exploratory shaft sunk in 1777 on the upper valley side of Tyne, to the immediate west of the Roman fort, in an area known as 'Wall Laws'. By the time of the first edition Ordnance Survey map *c.* 1860, Wallsend Colliery was served by a waggonway which crossed the area now occupied by the Dry Dock and ran to Heaton Staithes on the river. This waggonway branched from the Gosforth and Kenton Waggonway, which served Bigges Main Colliery further to the north-west and ran to Coxlodge Staithes following the line of what is now Benton Way, immediately to the west of the Swan Hunter site. An early timber version of this waggonway - dating to the eighteenth century - was recorded in the summer of 2013 during work in the former Neptune shipyard, off Benton Way, immediately to the west of the former Swan Hunter shipyard site.

2.5.17 By the time of the 1854 Ordnance Survey several substantial building ranges and associated formal gardens were present within the area of the fort and further buildings skirting the northern edge of the fort and immediately to the east and west of the Roman fort. By the late nineteenth century the North Tyneside riverside had become heavily industrialised with the area of the Roman fort and surrounding areas to the north, east and west now occupied by residential terraces.

Early Modern and Modern

2.5.18 In 1914 the Staff Institute building was constructed along the eastern part of the site for Swan Hunters' workers. A canteen was later constructed in 1941 south of the Staff Institute building with the two buildings linked by a gymnasium building.

2.5.19 The residential terrace buildings that occupied the area of the Roman fort were demolished in the 1970–80s to make way for a car park.

2.5.20 In 1997–1998 a program of archaeological and construction work was undertaken across the site to create a new museum centered on *Segedunum* fort. This comprised a museum building, including an observation tower and study centre, consolidation of the fort layout and a bath house reconstruction. Prior to the construction of the museum, the former gymnasium building linking the former Staff Institute building and canteen building was demolished with the latter buildings incorporated into the museum.

3. PROJECT AIMS AND RESEARCH OBJECTIVES

3.1 Project Aims

3.1.1 The aim of the archaeological evaluation was to refine current understanding of the location, depth, extent and significance of archaeological deposits at the site through trial trenching, This was to inform the Local Planning Authority (LPA), as advised by the County Archaeologist, on the most suitable location for the proposed works for the sewerage scheme linking *Segedunum* Museum to a new pumping station being construction in the former Swan Hunter shipyard.

3.1.2 The proposed work was undertaken east of the Scheduled area immediately outside the Roman fort. Although previous archaeological excavations undertaken within the vicinity of the proposed works remain unpublished, the archives were referred to prior to commencement of the archaeological evaluation. To this end previous archaeological investigations identified three parallel defensive ditches identified to the east of the fort and a road extending eastwards from the east gate.

3.1.3 The proposed sewerage scheme is to be located within the car park to the south and within the garden and museum footpath access to the north, between the postulated locations of the two outermost defensive ditches, which would result in the sewerage spur to the north having to cross the outer defensive ditch. The principle sewerage connection can be installed using trenchless techniques between the two outer defensive ditches and below the maximum depth of potential archaeological deposits or features. Therefore the work was specifically designed to establish the depth and extent of any archaeological deposits or features within the location of the enabling pits for the installation of the principle sewerage connection and sewerage spur connecting the existing sewer at the museum.

3.1.4 In sum, the archaeological evaluation was designed to:

- identify the location of the outer fort ditches and to provide information for the proposed sewerage works to allow disturbance of archaeological deposits to be minimised.

3.1.5 Additional aims of the project were:

- to compile a Site Archive consisting of all site and project documentary and photographic records, as well as all artefactual and palaeoenvironmental material recovered;
- to compile a report that contains an assessment of the nature and significance of all data categories, stratigraphic, artefactual, *etc.*

3.2 Research Objectives

3.2.1 The specific research objectives of the archaeological evaluation were principally for the Roman, since the proposed sewerage works lay immediately to the east of the *Segedunum* Roman fort, the majority of which is a scheduled ancient monument and the Branch Wall portion of Hadrian's Wall ran across it from the south-east corner of the fort to the River Tyne (Figure 2). The site also lies within the within the Buffer Zone of the Hadrian's Wall component of the transnational *Frontiers of the Roman Empire* WHS.

3.2.2 As a result of its location the archaeological evaluation was considered to have good potential to make a significant contribution to the existing knowledge of Wallsend in general and of the Roman frontier in particular. Specific research objectives to be addressed by the project were formulated with reference to existing archaeological research frameworks. *Shared Visions: The North-East Regional Research Framework for the Historic Environment* (NERRF), highlights the importance of research as a vital element of development-led archaeological work (Petts and Gerrard 2006). The two-volume *Frontiers of Knowledge: A Research Framework for Hadrian's Wall* (HWRF) also identifies and prioritises an agenda of key themes research for the forts and their surroundings (Symonds and Mason 2009). The Hadrian's Wall Management Plan (HWMP) sets out guidance in relation to the importance of Hadrian's Wall, the need for understanding, monitoring and conservation.

3.2.3 The NERRF identifies the following key priorities within the research agenda for the Roman period which are of direct relevance to this project:

- Riii – The Roman military presence

3.2.4 The Research Strategy of *Frontiers of Knowledge* was compiled to respond to gaps in knowledge pertaining to the archaeology of the Wall and associated extramural settlement activity as highlighted in the Research Agenda (Volume I of the document). A prioritised set of objectives was devised within eight main themes, three of which relate specifically to the forts and there surroundings, S5: The Forts and Extramural Settlement, A4: The Forts and Extramural Settlement and A5: Landscape and Environment

3.2.5 In sum, the archaeological evaluation of the site had the following site-specific research objectives:

- to assess the significance of any buried archaeological remains, specifically those of the Roman period, and to determine whether any remains encountered provide evidence for the forts outer defences and if those can be attributed to those recorded during previous excavations;

- to better understand the sequence and lifespan of the fort ditches in this area;
- to provide information to inform future management of the archaeological remains outside the scheduled boundary;
- to provide information to inform future management of the archaeological remains outside the scheduled boundary.

4. ARCHAEOLOGICAL METHODOLOGY

4.1 Fieldwork

4.1.1 The evaluation fieldwork was undertaken April–May 2015. All fieldwork was undertaken in accordance with the relevant standard and guidance document of the Chartered Institute for Archaeologists (CIfA 2014a). PCA is a CIfA-Registered Organisation. The evaluation was undertaken according to the WSI compiled by Amec Foster Wheeler (included as Appendix 5 to this report) which should be consulted for full details of methodologies employed regarding archaeological evaluation, excavation, recording and sampling.

4.1.2 Archaeological trial trenching was considered as the most appropriate investigative tool to test the archaeological potential of the area. Three trenches (Trenches 1-3) were investigated; Trench 1 was located within the museums garden and access footpath to the north and Trenches 2 and 3 were located within the museum car park to the south (Figure 2).

4.1.3 A summary of the rationale for the trenching (with trench dimensions) is set out below:

- Trench 1 (*c*. 9m x 1m) – sited to investigate proposed sewerage connections to Segedunum museum buildings and define a safe zone between the fort ditches for a reception pit and manhole location.
- Trench 2 (*c*. 8m x 2m) – sited to define a safe zone between the outer fort ditches for trenchless pipe laying.
- Trench 3 (*c*. 4m x 4m) - sited to identify an appropriate location for drive pit.

4.1.4 The central portion of Trench 1 was expanded (*c*. 3.40m x 3.40m) to allow for the location of a manhole and reception pit for the directional drilling rig. At this location archaeological remains were encountered at a relatively high level below present ground level and would have been impacted upon by the excavation of the reception pit. Previous archaeological work undertaken within this area partially excavated archaeological remains. Therefore it was decided that the surviving archaeological remains that would potentially be impacted upon by the excavation of the reception pit were to be fully excavated.

4.1.5 In Trench 2 archaeological features and deposits encountered were partially excavated to establish the date, extent and degree of survival to allow a safe margin for the trenchless excavation. It was established that the trenchless excavation within this area would be carried out at a significantly greater depth than that of the established depths of surviving archaeological remains and it was therefore decided that these archaeological remains would not be impacted on by the proposed

excavation and were left *in-situ*. Where archaeological remains were left *in-situ* a breathable membrane was laid down prior to backfilling the trench.

4.1.6 All trenches were set-out by PCA using a Leica Viva Smart Rover Global Navigation Satellite System (GNSS), with pre-programmed co-ordinate data determined by an office-based CAD Technician. The Smart Rover GNSS provides correct Ordnance Survey co-ordinates in real time, to an accuracy of 1cm.

4.1.7 All trenches were mechanically-excavated by a back-acting 'JCB' with toothless ditching bucket under archaeological supervision. The trenches were excavated to the top of the first significant archaeological horizon, or the clearly defined top of the natural sub-stratum, whichever was reached first.

4.1.8 Hand cleaning was undertaken in all trenches. All potential features were subject to partial or complete excavation within the trenches with photography and archaeological recording taking place at appropriate stages in the process. A selection of digital photographs is included as Appendix 4 to this report. All trenches were recorded, irrespective of whether or not they contained archaeological features.

4.1.9 A Temporary Bench Mark was established at the site using the Smart Rover GNSS instrument. The height of all principal strata and features were calculated relative to Ordnance Datum and indicated on the appropriate plans and sections.

4.2 Post-excavation

4.2.1 The stratigraphic data generated by the project is represented by the written, drawn and photographic records. A total of 78 archaeological contexts were defined in the 3 trenches (Appendix 2). Post-excavation work involved checking and collating site records, grouping contexts and phasing the stratigraphic data (Appendix 1). A written summary of the archaeological sequence was then compiled, as described below in Section 5.

4.2.2 The artefactual material from the evaluation comprised a small assemblage of animal bone, pottery, ceramic building material, glass and metal-working debris. Individual finds of an iron nail shank and a copper-alloy coin were also recovered. Examination of the artefactual material was undertaken and relevant comments integrated into Section 5, with a summary report on the material included as Appendix 3. No other categories of organic or inorganic artefactual material were represented. None of the material recovered during the evaluation required specialist stabilisation or an assessment of its potential for conservation research.

4.2.3 The palaeoenvironmental sampling strategy of the project was to recover bulk samples where appropriate, from well-dated stratified deposits covering the main periods or phases of occupation and the range of feature types represented, with specific reference to the objectives of the evaluation. To this end three bulk samples

were collected, one from the fill of the Roman outer defensive ditch in Trench and two samples from the fills of two postholes in Trench 2. These samples have been retained for assessment if required.

4.2.4 The complete Site Archive will be packaged for long term curation. In preparing the Site Archive for deposition, all relevant standards and guidelines documents referenced in the Archaeological Archives Forum guidelines document (Brown 2007) will be adhered to, in particular a well-established United Kingdom Institute for Conservation (UKIC) document Walker, (UKIC 1990) and the relevant CIfA publication (CIfA 2014b). The depositional requirements of the body to which the Site Archive will be ultimately transferred will be met in full.

5. RESULTS: THE ARCHAEOLOGICAL SEQUENCE

During the evaluation, separate stratigraphic entities were assigned unique and individual 'context' numbers, which are indicated in the following text as, for example [123]. The archaeological sequence is described by placing stratigraphic sequences within broad phases, assigned on a site-wide basis in this case. An attempt has been made to add interpretation to the data, and correlate these phases with recognised historical and geological periods.

5.1 Trench 1 (Figure 3 & Figure 6; Section 1; Plates 1 & 2)

Phase 1: Natural sub-stratum

5.1.1 The natural clay sub-stratum, [115], was exposed for a maximum distance of *c*. 13m by 2.70m across the base of Trench 1. This comprised firm mid brownish yellow clay encountered at maximum and minimum depths below present ground level of *c.* 1.30m and 1.00m, and recorded at maximum and minimum heights of 22.17m OD and 21.88m OD, respectively. This deposit was directly overlain by Phase 2 Roman deposits, suggesting that little if any truncation of natural sub-stratum has occurred at this location.

Phase 2: Roman and undated

5.1.2 Directly overlying the natural sub-stratum was a *c*. 0.34m thick clay silt deposit, [111] (Section 1). This deposit was exposed at the south-western part of the trench for a distance of 3.38m NW-SE by 2.50m NE-SW, at a depth of *c*. 0.80m below the present ground level and was recorded at a maximum height of 22.49m OD. A small assemblage of finds was recovered including a single sherd of second-century samian pottery, ten fragments of ceramic building material and ten fragments of animal bone along with an iron nail shank and a copper-alloy *denarius* coin dating to AD 81 (see Appendix 3).

5.1.3 Located at the south-eastern extent of the trench was a *c*. 0.26m thick clay silt deposit, [119]. This was exposed for a maximum distance of 1.60m NW-SE by 0.70m NE-SW, at a depth of *c*. 0.80m below present ground level and was recorded at a maximum height at 22.51m OD. A small assemblage of artefactual material was recovered from this deposit including three fragments of Roman ceramic building material and a single fragment of animal bone. This deposit directly overlay the natural sub-stratum, [115], and may represent a continuation of deposit [111].

5.1.4 A substantial NE-SW aligned ditch [114] truncated levelling deposits [111] and [119], within the central portion of the trench. It was exposed for a maximum distance of 3.36m NE-SW and was up to *c*. 3.94m wide by up to 0.90m deep with a wide U-shaped base. The ditch was encountered at a depth of *c.* 1.20m below present ground level, at a maximum height of 22.61m OD. A small assemblage of finds was recovered from its single sandy silt fill, [113], including thirteen sherds of pottery broadly dating to the third century AD, twenty-two fragments of ceramic building

material, forty-nine fragments of animal bone and a single piece of window glass. This ditch represents outermost defensive ditch of the fort which was partially exposed and excavated during the 1997 archaeological excavations associated with the expansion of the Museum building.

Phase 3: Post-medieval

5.1.5 The earliest Phase 3 deposits encountered in Trench 1 comprised four levelling and consolidation deposits, [118], [112], [128] and [110], that were probably laid down prior to the construction of the late nineteenth-century residential terraces (Figure 6; Section 1). These deposits comprised variously coloured clayey silts and had a maximum combined thickness of 0.55m with the uppermost strata of these deposits encountered at maximum and minimum heights of 23.01m OD and 22.79m OD, respectively. A small assemblage of post-medieval finds was recovered from these deposits including pottery and a glass bottle.

5.1.6 Located at the north-eastern end of the trench, truncating deposit [112], was a *c*. 0.32m wide NW-SE aligned brick wall [129] built within a narrow construction cut [123]. This was exposed extending across Trench 1 for a distance of 1.60m, continuing beyond the limits of excavation. Only a single course survived to 0.16m high and this was encountered at a maximum height of 22.97m OD. It was built using unfrogged handmade red brick (230mm x 120mm x 70mm), bonded with a light grey lime mortar. No artefactual material was recovered from the clayey silt backfill [130] of the construction cut. This wall probably represents part of a structure associated with nineteenth-century residential terraced buildings that formerly extended across the site.

5.1.7 Two linear features, [121] and [124], which truncated the upper strata of levelling and consolidation deposits probably represent services associated with the nineteenth-century residential terraces. NW-SE aligned linear feature [121] was recorded in section extending across the central part of the trench and was 0.72m wide and 0.30m deep, encountered at a maximum height at 23.01m OD. No artefactual material was recovered from its single sandy silt fill [125].

5.1.8 Located at the north-eastern end of the trench was a NW-SE aligned linear feature, [124], recorded in section. Its north-eastern edge was truncated by a modern service trench, [107], and it was at least 0.30m wide by 0.75m deep, encountered at a maximum height at 22.25m OD. Its single fill, [127], comprised clay silt from which no artefactual material was recovered.

Phase 4: Modern

5.1.9 Located in the central part of the trench was the former archaeological trench, [117], that formed part of the 1997 excavations. This extended NW-SE across Trench 1 and was up to 2.90m wide and 1.40m deep. The area of the former excavation as

exposed in Trench 1 extended across the top of the central portion of the Roman ditch, [114], to the north-west and encompassed a section of the ditch that was fully excavated to the south-east. A breathable membrane had been laid down prior to the backfilling of the excavation area with *c.* 0.17m thick deposit of sand, [109], in turn was overlain by *a* deposit of stone, [108].

5.1.10 The uppermost backfill of the 1997 excavation area was truncated along its north-eastern edge by a NW-SE aligned service trench, [122], measuring 1.42m wide by 0.46m deep. Its single stone fill, [126], contained an orange plastic duct and a blue plastic water pipe that was probably installed immediately after the excavation area had been backfilled; these services were live at the time of the current evaluation.

5.1.11 Two deposits, representing 20th-century levelling activity were recorded in section at the south-western end of Trench 1; a *c*. 0.14m thick sand and a *c*. 0.23m thick deposit of stone, [105] and [116]. The uppermost of these strata was encountered at a maximum height of 23.11m OD. A NW-SE aligned concrete slab, [131], measuring 0.80m wide and up to 0.10m thick directly overlay deposit [105]. It is unclear if this concrete slab represents part of an earlier path or discarded material associated with the concrete kerb located immediately to the south-west.

5.1.12 The present footpath leading to the museum entrance was recorded at the south-western extent of the trench and comprised *c*. 80mm thick concrete slabs, [103], and associated *c*. 70mm thick sand bedding deposit, [104]. Along the north-eastern edge of the footpath were concrete kerb stones and associated concrete bedding, [102].

5.1.13 At the north-eastern extent of the trench part of a substantial brick built manhole was recorded in a broad construction cut, [107], that was backfilled by stone [106].

5.1.14 The present ground level in the area of Trench 1 comprised *c*. 0.30m thick loose sandy silt garden soil, [100], encountered at a maximum height of 23.36m OD.

5.2 Trench 2 (Figure 4 & Figure 6; Sections 2 & 4; Plates 3–6)

Phase 1: Natural sub-stratum

5.2.1 The natural clay sub-stratum was exposed across the base of Trench 2 and comprised firm mid brownish yellow clayey sand, [217]. This was encountered at a depth of *c*. 1.10m below the present ground level, at maximum and minimum heights of 21.39m OD and 21.16m OD, respectively.

Phase 2: Roman and undated

5.2.2 A group of inter-cutting features was located in the central portion of Trench 2, including four presumed to be sub-oval features, [229], [231], [232], [236], a ditch [223] and ditch re-cut [227]. The four sub-oval features truncated the natural sub-stratum on a roughly north-south alignment. Feature [229] was fully excavated and [23] partially excavated, features [232] and [236] remained unexcavated. Feature

[231] measured 1.20m north-south by 0.70m east-west and was up to 0.56m deep. Their fills, [228], [230], [233], [234] and [235], generally comprised variously coloured clayey silt and sandy silt from which only a single fragment of Roman tile was recovered from fill [230]. These features have been interpreted as possible postholes, although definitive interpretation is impossible. If they do represent postholes then they may represent an earlier phase of Roman occupation prior to the establishment of the outer ditch defences.

5.2.3 A 0.48m thick deposit of firm sandy clay deposit, [212], was recorded in section for a distance of 2.40m NE-SW, overlying the natural sub-stratum and the backfill of posthole [231]. This may represent a dump/levelling deposit. Although no artefactual material was recovered from this deposit, it was truncated by a ditch [223] of probable late second-century date so predates this feature.

5.2.4 A NW-SE aligned ditch, [223], extended across Trench 2 for a distance of 1.90m, truncating deposit [212] and posthole [231]. This was up to 1.50m wide and 0.60m deep and had a narrow V-shaped profile. A small assemblage of artefactual material was recovered from its single sandy clay deposit, [211], including two sherds of late second-century AD pottery, one fragment of ceramic building material and three fragments of animal bone (See Appendix 3). The form and size of this ditch suggests that rather than a defensive feature it may represent a boundary or drainage feature associated with the agricultural use of this area prior to the construction of the third fort defensive ditch to the east in the third century.

5.2.5 Truncating the eastern edge of ditch, [223], a similarly aligned re-cut, [227], was exposed for a distance of 1.90m; this was up to 1.38m wide by 0.40m deep. A small assemblage of material was recovered from its single sandy silt fill, [210], including twelve sherds of pottery dating from the second century AD, eight fragments of ceramic building material and twenty-three fragments of animal bone. This feature represents the re-establishment of the earlier boundary, [223], once silted up, and as with ditch [223] probably forms part of a system of boundary or drainage features prior to the excavation of the third outer ditch.

5.2.6 At the north-eastern extent of Trench 2 part of a NW-SE aligned linear feature, [216], truncated the natural sub-stratum. It was exposed for a maximum distance of 1.90m and was at least 1.40m wide and 0.68m deep. This feature is on a similar alignment to ditch [114] recorded in Trench 1 and represents the western side of the third outer defensive ditch of the fort. A small assemblage of finds was recovered from its single clayey silt fill, [215], including five sherds of late third-century AD pottery, two fragments of ceramic building material and twelve fragments of animal bone (see Appendix 3).

Phase 3: Post-medieval

5.2.7 Two levelling and consolidation deposits, [214] and [226], were exposed for a distance of 3.60m NE-SW by 2.00m NW-SE across the central and north-eastern extent of the trench, directly overlying Phase 2 Roman deposits and features (Figure 6; Section 2). These deposits comprised silty clay and clayey silt, respectively, and had a maximum thickness of 0.18m with the uppermost strata of these deposits encountered at maximum and minimum heights of 21.69m OD and 21.59m OD. Although no artefactual material was recovered from these deposits, they were probably laid down sometime in the late nineteenth century as ground preparation prior to the building of residential terraces.

5.2.8 Located at the north-eastern extent of the trench, truncating levelling and consolidation deposits [214] and [226], was a *c*. 0.62m wide NW-SE aligned brick wall, [221], built within a narrow construction cut [222]. This extended across the trench for a distance of 2.00m, continuing beyond the limits of excavation. Only a single course survived; it was built with unfrogged handmade red bricks (230mm x 120mm x 70mm), bonded with a light grey lime mortar. The construction cut was backfilled by *c* 0.16m thick compact gravel, [219], overlain by a *c*. 60mm thick concrete slab, [220], forming the sub-base for the brick wall. This wall probably forms part of the late nineteenth-century residential terraces which formerly extended across the site and is likely to be contemporary with similar walls recorded in Trenches 1 and 3.

5.2.9 In the south-eastern end of the trench, a broad linear feature, [237], truncated levelling and consolidation deposit [226] and the fill [210] of Phase 2 Roman ditch re-cut [227]. It was aligned NW-SE and was *c*. 3.82m wide by up to 0.30m deep, encountered at 0.85m below present ground level, at a maximum height of 21.67m OD. Its lower *c*. 0.34m thick sandy clayey silt fill, [209], produced a single sherd of early post-medieval pottery. No artefactual material was recovered from its *c*. 80mm thick sandy clayey silt upper fill, [208]. Due to the limited exposure of this feature its function is uncertain. Its shallow depth is likely to be the result of horizontal truncation associated with the demolition and subsequent levelling of the residential terraced buildings which occurred during the 1970s.

5.2.10 A NW-SE aligned narrow linear feature, [224], truncated the upper fill of feature [237] and this measured *c*. 0.12m wide and was at least 0.60m deep. Its profile indicates that it probably represents a service trench associated with the terrace of houses.

Phase 4: Modern

5.2.11 Overlying the uppermost Phase 3 brick wall [221] and feature [237] were four deposits, [213], [206], [218] and [225], which represent demolition and levelling activity associated with the demolition of housing in this area in the 1970s. These

deposits comprised various compositions of clay, sand, silt and brick and concrete rubble and had a maximum combined thickness of 0.50m, with the uppermost stratum of these deposits encountered at a maximum height of 21.95m OD.

5.2.12 The demolition and levelling deposits were overlain by three modern levelling deposits, [204], [205] and [207], generally comprising stone with the exception of crushed concrete deposit [204]. These deposits had a combined thickness of *c*. 0.30m.

5.2.13 The present ground level in the area of Trench 2 comprised *c*. 0.18m thick asphalt, [200], encountered at a maximum height of 22.57m OD and associated *c*. 0.12m thick sand, [202], and stone, [203], consolidation deposits.

5.3 Trench 3 (Figure 5 & Figure 6; Section 3; Plates 7–8)

Phase 1: Natural sub-stratum

5.3.1 The natural clay sub-stratum, [306], was exposed for a maximum distance of *c*. 3.60m by 3.40m across the base of Trench 3. This comprised stiff mid reddish brownish clay, encountered at a depth of *c.* 1.30m below present ground level and recorded at a maximum height of 20.11m OD. This deposit was overlain by a substantial levelling/consolidation deposit; it is considered likely that natural sub-stratum had been horizontally truncated by Phase 3 post-medieval activity in this area.

Phase 3: Post-medieval

5.3.2 Levelling and consolidation deposit, [305], was exposed for a distance of 3.50m NW-SE by 3.70m NE-SW and directly overlay the natural sub-stratum (Figure 5; Section 3). It comprised *c*. 0.60m thick silty sand and was encountered at maximum and minimum heights of 20.53m OD and 20.47m OD, respectively. A single sherd of post-medieval pottery was recovered from this deposit which was probably laid down sometime in the late nineteenth century as ground preparation prior to the building of residential terraces.

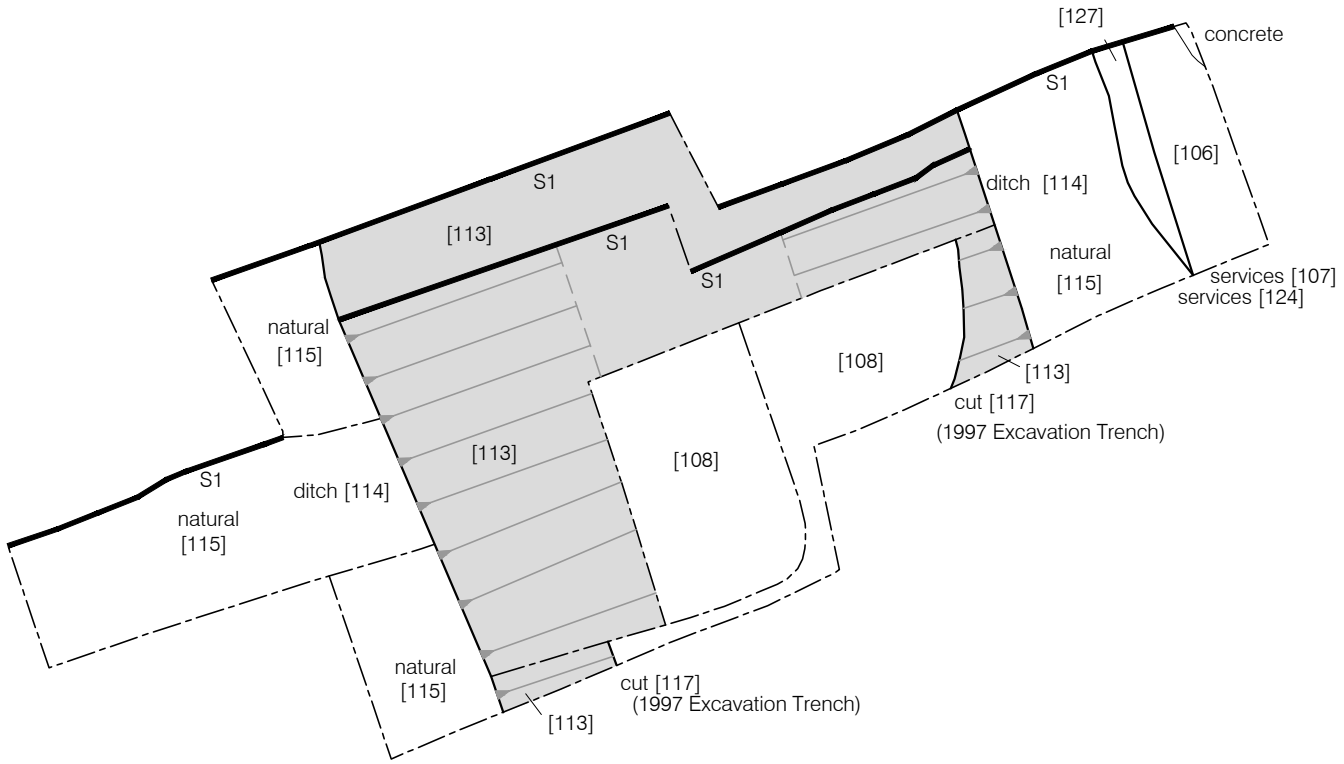
5.3.3 A NE-SW brick wall foundation, [308], was recorded in section within a narrow construction cut, [309], measuring 0.30m wide by 0.31m deep. The wall foundation survived to three courses built in unfrogged red brick (230mm x 120mm x 70mm), bonded with light grey lime mortar. This wall is probably contemporary with walls recorded in Trenches 1 and 2 representing part of a building associated with the late nineteenth-century residential terraces.

Phase 4: Modern

5.3.4 The earliest Phase 4 deposit representing 20th-century levelling activity comprised a *c*. 0.18m thick deposit of sandy silt, [304], which extended across Trench 3, encountered at a maximum height of 20.65m OD.

5.3.5 This was overlain by a buried *c*. 0.12m thick asphalt surface, [302], and associated *c.* 60mm thick sandy gravel consolidation deposit, [303]. The buried asphalt surface was encountered at maximum and minimum heights at 20.81m OD and 20.69m OD.

5.3.6 The present car parking surface in the area of Trench 3 comprised *c*. 0.18m thick asphalt, [300], and associated *c*. 0.46m thick stone, [301], consolidation deposit. A substantial *c.* 0.22m thick concrete slab, [307], was partially exposed at the south-western corner of the trench and probably represents further consolidation for the present surface. The asphalt surface was encountered at a maximum height at 21.43m OD.

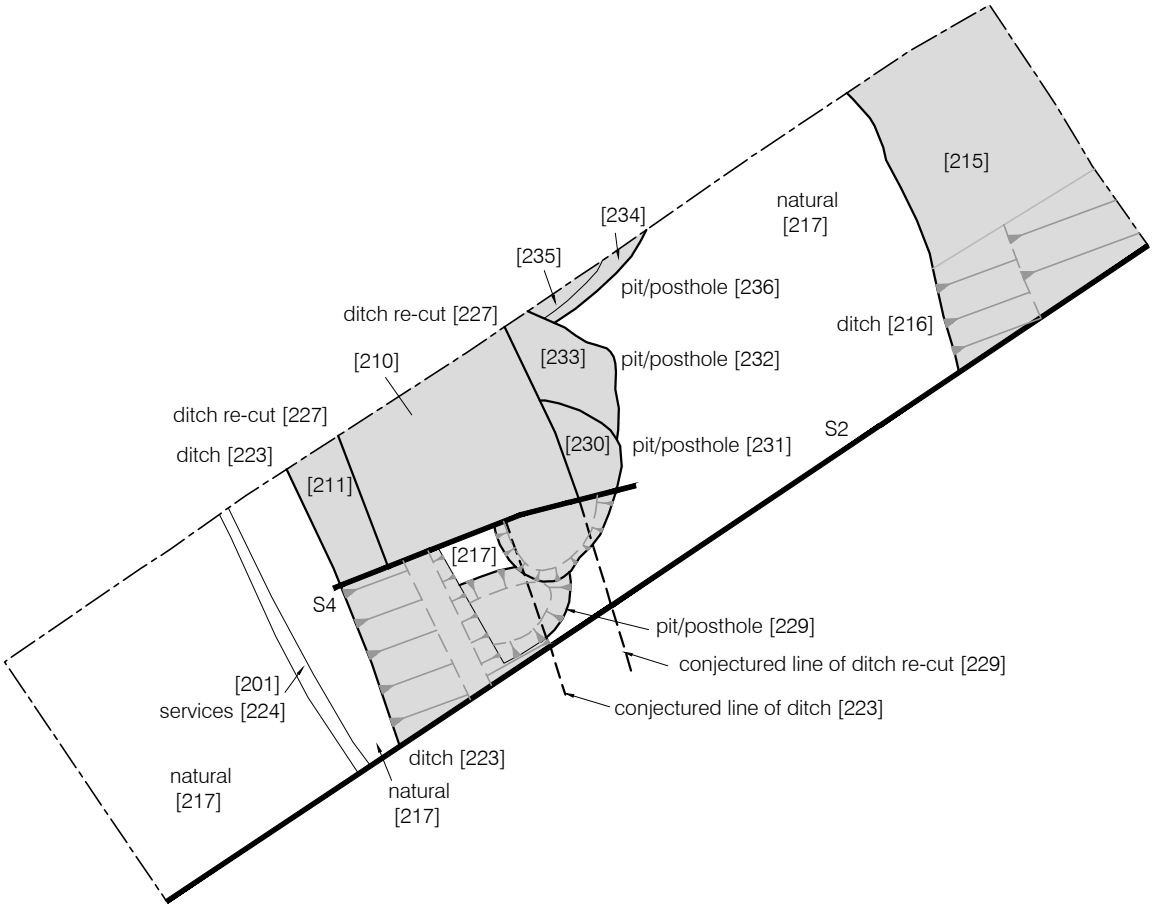


Roman

0 2m

17/03/16 JS

Figure 3
Trench 1 Plan
1:50 at A4

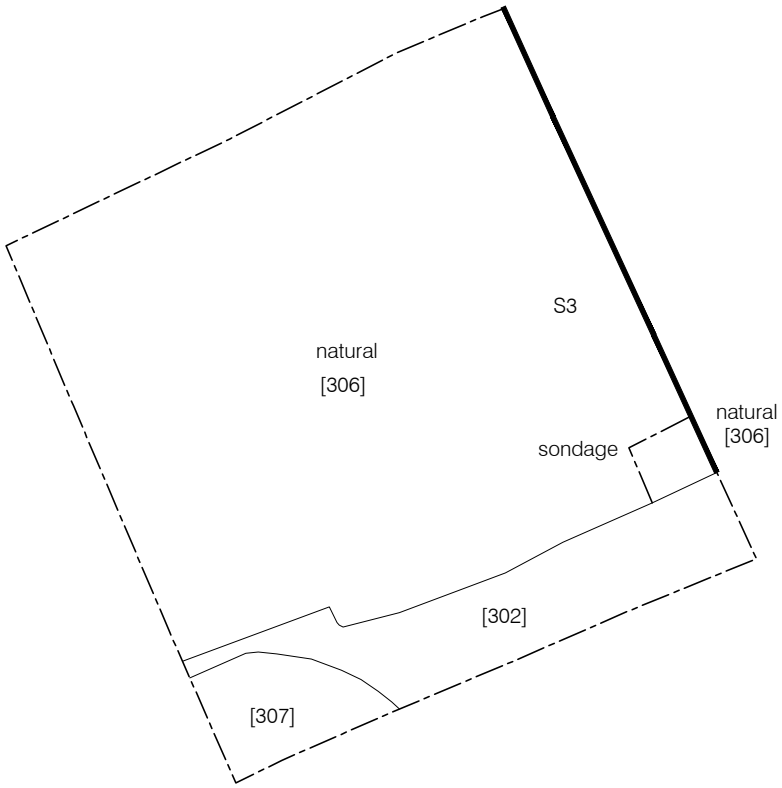


Roman

0 2m

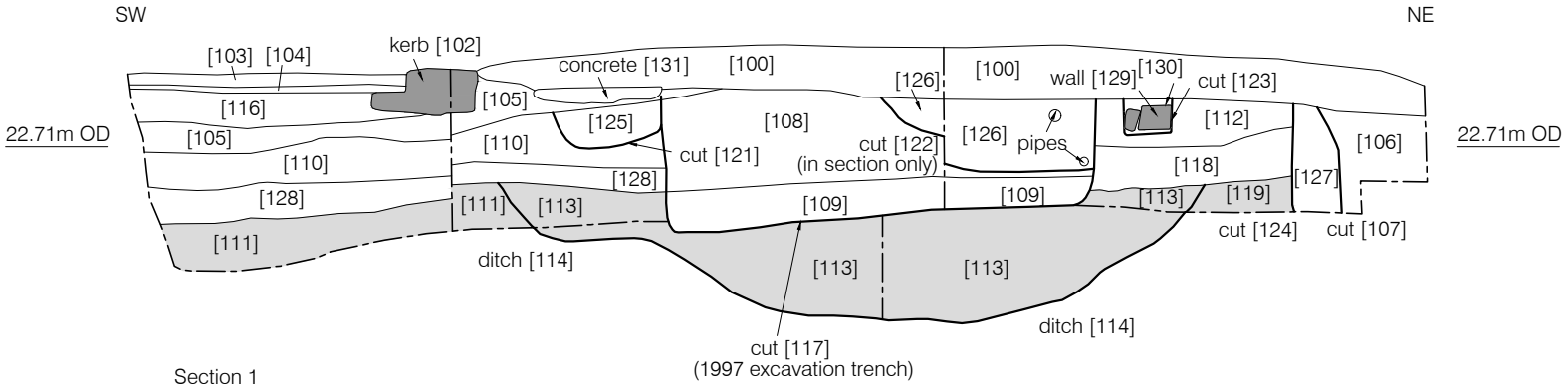
17/03/16 JS

Figure 4
Trench 2 Plan
1:50 at A4

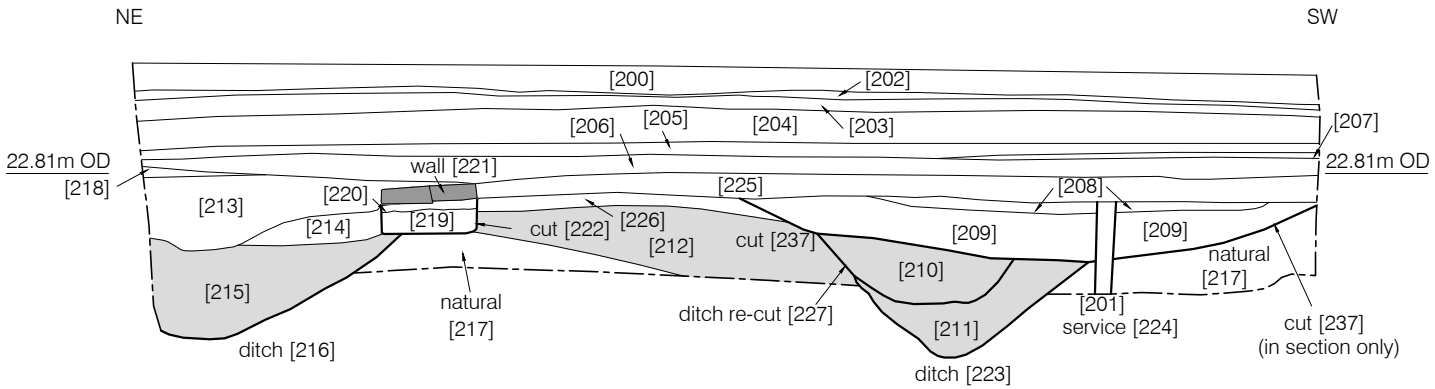


17/03/16 JS

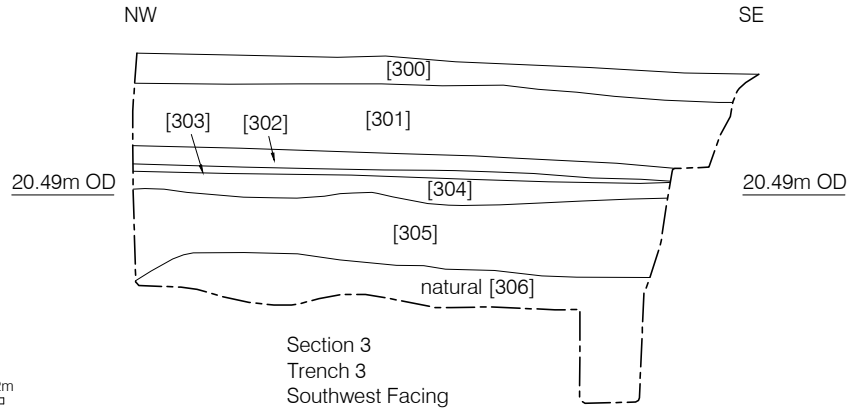
Figure 5
Trench 3 Plan
1:50 at A4



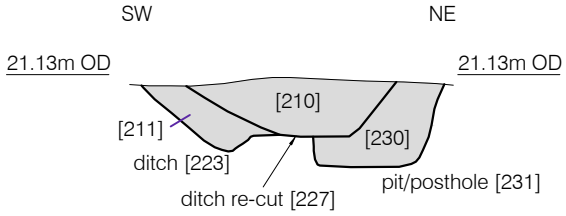
Section 1
Trench 1
Southeast Facing



Section 2
Trench 2
Northwest Facing



Section 3
Trench 3
Southwest Facing



Section 4
Trench 2
Southeast Facing

Masonry
Roman

0 2m

 17/03/16 JS

Figure 6
Sections 1 - 4
1:50 at A4

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

6.1.1 Geological deposits and archaeological deposits and features encountered during the evaluation have been assigned to four phases of activity:

Phase 1: Natural sub-stratum

6.1.2 Boulder clay representing the drift geology of the area was the basal deposit encountered within all three trenches and generally comprised firm to stiff brownish yellow and reddish brown clay and clayey sand. Substantial levelling activity has been undertaken during the nineteenth and twentieth centuries across the area in the vicinity of the trenches; the level at which the natural deposits were encountered reflects the original natural topography.

6.1.3 The fort of Segedunum was situated on an elevated spur of land, which at the time of construction lay at *c.* 29m above sea level and was defined by stream valleys to the east and west (Hodgson 2003, 11). The ground fell away sharply from the southern edge of the fort to the shoreline which in the Roman period, before alteration of the river channel and land reclamation, is estimated to have lain 100m from the south-east corner of the fort and 160m from the south-west corner. The original deep water channel of the River Tyne is thought to have been situated near to the north bank in the Wallsend area, beneath the area formerly occupied by the Swan Hunter site. Groyning works in the early 19th century moved the channel southwards and much of the area developed as the shipyard was reclaimed from the tidal mud flats created by the shifting of the channel.

6.1.4 The maximum height of the natural sub-stratum was 22.17m OD in Trench 1 to the north and the minimum height in the southern portion of the site was 20.11m OD in Trench 3, reflecting the sloping valley side of the Tyne. The depth below present ground level at which the natural sub-stratum was encountered varied from a maximum of *c*. 1.40m in Trench 3 and a minimum of *c*. 1m in Trench 1.

6.1.5 Horizontal truncation of the natural sub-stratum was evident in Trench 3 and to a lesser extent in Trench 2, where truncated features and deposits of Roman date were encountered. No horizontal truncation had occurred within the area of Trench 1 with Phase 2 Roman features and deposits recorded directly overlying the natural sub-stratum.

Phase 2: Roman and undated

6.1.6 Roman remains were recorded in Trenches 1 and 2 which were situated to the north and south of the road leading out of the east gate, respectively, between the projected lines of the second and third fort defensive ditches. A trench excavated during the 1997 excavations was located within Trench 1. Features encountered in

Trench 2 could potentially represent activity prior to the construction of the third outer defensive ditch in the third century and second-century deposits were also recorded in Trench 1.

6.1.7 Dating evidence recovered from the Roman features in the evaluation trenches supports the postulated development of the ditch system outlined in the 2003 publication of the fort excavations (Hodsgon 2003, 18–21). In the Hadrianic period and through the second century AD the eastern side of the fort was surrounded by an inner ditch with a 7m-wide berm between ditch and fort. A second ditch located 2–3m beyond the inner ditch is also considered to be primary. This ditch was exposed in the 1997 excavations close to east gate, 18m from the fort wall, and in this area was 5.20m wide. At least one building flanked the south side of the road leading out of the east gate of the fort in the second century and this would have been north of Hadrian's Wall as the Branch Wall runs south-eastwards to the River Tyne from the south-east corner of the fort. The main road out of the east gate seems to have been in use in all periods except the mid or later third century when the causeway across the outer ditch was narrowed to 1.50m. A third outer ditch was added in the third century, this was located 25–27m from the fort wall. Where excavated in the 1997 trench this was at least 4m wide, but as only the terminal was exposed its full width was not established. By the fourth century the outer two ditches had been infilled and the road leading out of the east gate was substantial, being at least 12m wide.

6.1.8 A group of four inter-cutting postholes or small pits recorded in the central part of Trench 2 did not produce any datable artefactual material. They were overlain by a sandy clay deposit which was truncated by a NW-SE aligned ditch from which second-century pottery was recovered. At 1.50m wide and 0.60m deep this is more likely to represent a boundary or drainage ditch possibly associated with agricultural activity, rather than forming part of the forts outer defences. This ditch had silted-up and been re-cut with second-century pottery also recovered from the fill of the recut. This artefactual material and the location of this group of features between the second and third ditches indicate that the features were associated with activity external to the fort defences in the second century. Agricultural activity has previously been identified to the north-east of the fort; excavations in 1993 revealed a series of gullies interpreted as drainage channels or plot boundaries associated with cultivation of the land (Griffiths 1993). Areas of agricultural land were associated with the frontier forts, so that some supplies could be acquired close at hand. In Trench 1 a deposit of material overlying the natural sub-stratum produced second-century artefactual material and a first-century coin. This was truncated by the outer defensive ditch.

6.1.9 The third outer defensive ditch was exposed in Trenches 1 and 2 at depths of *c.* 1.20m and *c.* 1.10m below existing ground level. It is assumed that the original ground surface in this area had been horizontally truncated, probably in the

nineteenth century during the construction of the terraced houses, truncating the upper part of the Roman ditches. In Trench 1, which was sited in the area of a 1997 excavation trench and close to the ditch terminal adjacent to the road, the ditch was *c*. 4m wide and 0.90m deep. In Trench 2 only the western side of the outer defensive ditch was exposed. Third-century pottery was recovered from the feature in both trenches.

6.1.10 A small assemblage of Roman artefactual material was recovered from the investigations comprising 33 sherds of pottery, 21 pieces of Roman tile, a coin, a nail and a small quantity of animal bone and metal working debris (see Appendix 3). The fabrics represented in the pottery assemblage are typical of those found at Wallsend Roman Fort and include Dressel 20 amphora (olive-oil carrying), 10 sherds of samian and coarse wares. The ceramic building material also includes the range of fabrics typical for Wallsend fort with box tiles, roof tiles and floor tiles present. A voussoir box tile is of interest and adds to the small number of this type of tile recovered from Wallsend; so far the only other examples have been recovered from the area of the Branch Wall. The coin is a Domitian, AD 81, Denarius, mint of Rome.

Phase 3: Post-medieval and undated

6.1.11 Deposits interpreted as representing nineteenth-century consolidation and levelling were recorded overlaying Phase 2 Roman deposits and features in Trenches 1 and 2 and Phase 1 natural sub-stratum in Trench 3. Such deposits were laid down prior to the construction of residential terraced housing that occupied the site by the late nineteenth century and comprised various compositions of clayey silt in Trenches 1 and 2 and silty sand and sandy silt in Trench 3, and ranged in thickness form a maximum and minimum of 0.50m in Trench 2 to 0.70m in Trench 3.

6.1.12 In Trenches 1, 2 and 3, elements brick structures were partially exposed comprising NE-SW and NW-SE aligned foundations. The structural remains recorded in all three trenches probably represent elements of residential terraced buildings that occupied the site by the late nineteenth century. Variously aligned linear features representing services and drainage features were recorded in Trenches 1 and 2. These were probably utilities associated with the nineteenth-century terraced housing. These features were overlain by modern levelling deposits.

Phase 4: Modern

6.1.13 Demolition and levelling deposits with a combined maximum thickness of 0.60cm. were recorded in Trench 2. Brick and concrete rubble in these deposits probably derived from the demolition of the nineteenth-century terraced buildings during the 1970s.

6.1.14 Trench 1 was sited partially within the area of the archaeological excavation that was undertaken in 1997 associated with the construction of the museum buildings. The

former excavation trench extended across the central portion of Trench 1 In this earlier trench part of the forts outer defensive ditch was partially exposed and excavated. The excavated portion of the ditch and the excavation area had been covered with a breathable membrane prior to its backfilling with sand and stone to protect the remaining *in situ* Roman archaeological remains.

6.1.15 Various drainage and service features were recorded in Trench 1, including a construction cut for a brick manhole located immediately to the north-east of the trench that truncated the uppermost strata of Phase 3 levelling and consolidation deposits and modern services that were inserted into the upper strata of the archaeological trenches backfill. All of these were in use at the time of the evaluation.

6.1.16 A buried asphalt surface and associated stone consolidation layer was recorded in Trench 3 directly overlaying Phase 3 levelling and consolidation deposit and is probably of late 20th century date. The present ground surface in Trenches 2 and 3 comprised an asphalt surface and associated stone consolidation deposits that formed the museum car park and in Trench 1 by garden soil, concrete slab footpath and associated consolidation deposits that forming the pedestrian access to the museum.

6.2 Recommendations

6.2.1 In summary, Roman remains of second-century date potentially pre-dating the forts outer defensive ditches were recorded in Trenches 1 and 2. The full width of the third-century outer defensive ditch was exposed in Trench 1 to the north of the road leading out of the gate and the western side of this ditch was exposed to the south of the road in Trench 2.

6.2.2 Previous unpublished excavations within the fort and its outer defences have produced large artefactual assemblages and the evaluation trenches located east of the fort in the current archaeological work have demonstrated that archaeological deposits with significant artefactual assemblages do survive within this area. The results of the archaeological evaluation and previous archaeological excavation indicate that the proposed scheme of works had the potential to disturb Roman archaeological remains of local importance, specifically within the areas of Trenches 1 and 2.

6.2.3 The main broad aim of the evaluation was to inform the Local Planning Authority (LPA), as advised by the T&WSCT and the client regarding the extent, depth and nature of archaeological deposits within the location of the proposed sewerage works with the specific aim of minimising the disturbance of buried archaeological remains and to inform future decisions on the management of the archaeological remains outside of the scheduled area of the Roman fort.

6.2.4 The evaluation has established that although substantial horizontal truncation has occurred across the majority of the area outside of the scheduled area, archaeological remains of local significance associated with the forts outer defences and also Roman period features and deposits that pre-date the third-century defensive features are located to the east of the east gate.

6.2.5 In Trench 1 preservation *in situ* of these remains could not be reasonably warranted. Where archaeological remains of significance were identified they were archaeologically excavated to allow for the proposed works to proceed, therefore no further archaeological fieldwork at this location is recommended.

6.2.6 In Trench 2 the aim was to establish a safe zone to allow for the trenchless pipe laying. To this end the location and depth of Roman archaeological remains was established and partially excavated to allow for the reasonable clearance for the trenchless pipe laying, therefore no further archaeological fieldwork at this location was required.

6.2.7 No archaeological remains were identified at Trench 3 due to the substantial ground levelling that was probably undertaken during the nineteenth century within this area. No further archaeological fieldwork at this location was required.

6.2.8 Further analysis of some elements of the artefactual assemblage from the evaluation is recommended including specialist analysis of the animal bone and metal-working debris. The pottery assemblage requires a fully quantified ceramic archive catalogue which, although too small to be published, should be added to the existing database of Wallsend pottery. As with the pottery assemblage, the tile assemblage should be added to the existing database of the tile material from the *Segedunum* fort site. The coin requires publication.

6.2.9 It is recommended that the results of this evaluation should be included in any future publication detailing the investigations undertaken ahead of the redevelopment of the Swan Hunter shipyard.

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www.twsitelines.info/

8. ACKNOWLEDGEMENTS AND CREDITS

Acknowledgements

Pre-Construct Archaeology would like Gardiner & Theobald LLP for commissioning the archaeological evaluation on behalf of Kier Property.

The roles of Dave Heslop, the Tyne and Wear County Archaeologist (Tyne and Wear Specialist Conservation Team, Newcastle City Council) and Mike Collins, Inspector of Ancient Monuments (Hadrian's Wall) (English Heritage) are acknowledged.

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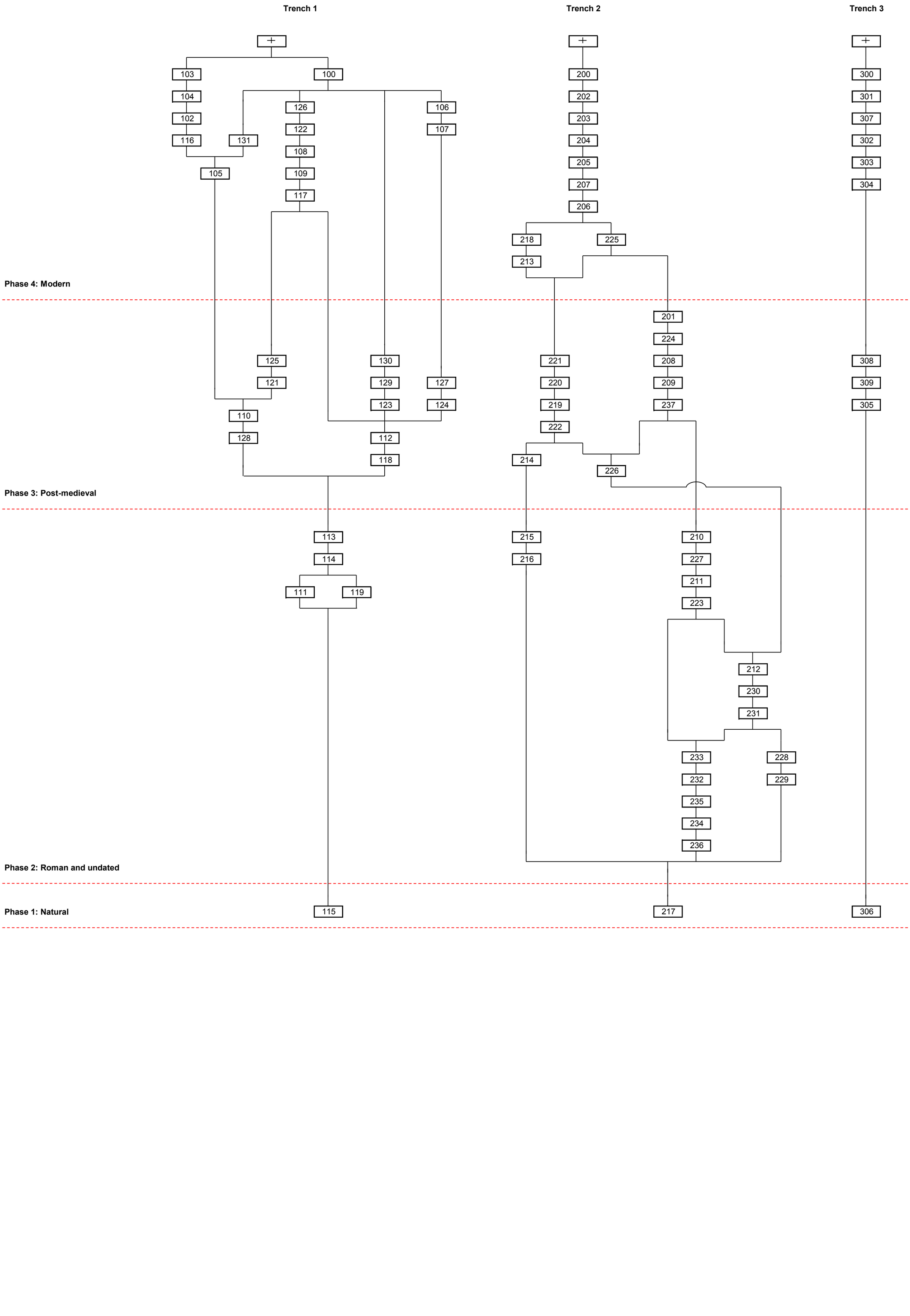
APPENDIX 1
STRATIGRAPHIC MATRICES

SMW 15: STRATIGRAPHIC MATRICES



APPENDIX 2
CONTEXT INDEX

SMW 15: CONTEXT INDEX

Context	*Trench*	*Phase*	*Type 1*	*Type 2*	*Interpretation*
100	1	4	Deposit	layer	Topsoil
101	1				Number not used
102	1	4	Masonry	Footpath	Concrete kerb blocks
103	1	4	Masonry	Footpath	Concrete paving slabs
104	1	4	Deposit	Layer	Bedding for paving slabs [103]
105	1	4	Deposit	Layer	Levelling/consolidation
106	1	4	Deposit	Fill	Fill of services [107]
107	1	4	Cut	Discrete	Modern services filled by [106]
108	1	4	Deposit	Fill	Fill of 1997 excavation trench [117]
109	1	4	Deposit	Fill	Fill of 1997 excavation trench [117]
110	1	3	Deposit	Layer	Levelling/consolidation
111	1	2	Deposit	Layer	Levelling
112	1	3	Deposit	Layer	Levelling/consolidation
113	1	2	Deposit	Fill	Fill of ditch [114]
114	1	2	Cut	Linear	Ditch filled by [113]
115	1	1	Deposit	Layer	Natural boulder clay
116	1	4	Deposit	Layer	Levelling/consolidation
117	1	4	Cut	Linear	1997 excavation trench filled by [108], [109]
118	1	3	Deposit	Layer	Levelling/consolidation
119	1	2	Deposit	Layer	levelling
120	1				Number not used
121	1	3	Cut	Linear	Service trench filled by [125]
122	1	4	Cut	Linear	Modern service trench filled by [126]
123	1	3	Cut	Linear	Construction cut for wall [129]; backfilled by [130]
124	1	3	Cut	Discrete	Modern service filled by [127]
125	1	3	Deposit	Fill	Fill of service trench [121]
126	1	4	Deposit	Fill	Fill of modern service trench [122]
127	1	3	Deposit	Fill	Fill of modern service [124]
128	1	3	Deposit	Layer	Levelling/consolidation
129	1	3	Masonry	Wall	Brick wall in construction cut [123]
130	1	3	Deposit	Fill	Backfill of construction cut [123]
131	1	3	Deposit	Structure	Concrete slab
200	2	4	Deposit	Structure	Asphalt surface
201	2	3	Deposit	Fill	Fill of service trench [224]
202	2	4	Deposit	Layer	Levelling/consolidation for surface [200]
203	2	4	Deposit	Layer	Levelling/consolidation for surface [200]
204	2	4	Deposit	Layer	Levelling/consolidation
205	2	4	Deposit	Layer	Levelling/consolidation
206	2	4	Deposit	Layer	Levelling/consolidation
207	2	4	Deposit	Layer	Levelling/consolidation
208	2	3	Deposit	Fill	Fill of ditch [237]
209	2	3	Deposit	Fill	Fill of ditch [237]
210	2	2	Deposit	Fill	Fill of ditch re-cut [227]
211	2	2	Deposit	Fill	Fill of ditch [223]
212	2	2	Deposit	Layer	?Earthwork bank deposit
213	2	4	Deposit	Layer	Demolition/levelling
214	2	3	Deposit	Layer	Levelling
215	2	2	Deposit	Fill	Fill of ditch [215]
216	2	2	Cut	Linear	Ditch filled by [215]
217	2	1	Deposit	Layer	Natural boulder clay
218	2	4	Deposit	Layer	Levelling
219	2	3	Deposit	Fill	Fill of construction cut [22]; wall [221]
220	2	3	Deposit	Structure	Concrete pad for wall [221]; construction cut [222]
221	2	3	Masonry	Wall	Brick wall in construction cut [222]
222	2	3	Cut	Linear	Construction cut for wall [221]; consolidation [219] and concrete pad [220]
223	2	2	Cut	Linear	Ditch filled by [221]
224	2	3	Cut	Linear	Service trench filled by [201]
225	2	4	Deposit	Layer	Demolition/levelling
226	2	3	Deposit	Layer	Levelling
227	2	2	Cut	linear	Ditch re-cut filled by [210]
228	2	2	Deposit	Fill	Fill of pit/posthole [229]

SMW 15: CONTEXT INDEX

Context	*Trench*	*Phase*	*Type 1*	*Type 2*	*Interpretation*
229	2	2	Cut	Discrete	Pit/posthole filled by [228]
230	2	2	Deposit	Fill	Fill of posthole [231]
231	2	2	Cut	Discrete	Posthole filled by [230]
232	2	2	Cut	Discrete	Posthole filled by [233]
233	2	2	Deposit	Fill	Fill of posthole [232]
234	2	2	Deposit	Fill	Fill of pit/posthole [236]
235	2	2	Deposit	Fill	Fill of pit/posthole [236]
236	2	2	Cut	Discrete	Pit/posthole filled by [234], [235]
237	2	3	Cut	Linear	Ditch filled by [208], [209]
300	3	4	Deposit	Structure	Asphalt surface
301	3	4	Deposit	Layer	Levelling/consolidation
302	3	4	Deposit	Structure	Asphalt surface
303	3	4	Deposit	Layer	Levelling/consolidation
304	3	4	Deposit	Layer	Levelling/consolidation
305	3	3	Deposit	Layer	Levelling/consolidation
306	3	1	Deposit	Layer	Natural boulder clay
307	3	4	Deposit	Structure	Concrete slab
308	3	3	Masonry	Wall	Brick wall in construction cut [309]
309	3	3	Cut	Linear	Construction cut for wall [308]

APPENDIX 3
FINDS IDENTIFICATION

ROMAN POTTERY, TILE AND SMALL FINDS ASSESSMENT

By **Alex Croom**

INTRODUCTION

The assemblage consists of 44 sherds of pottery, 22 fragments of ceramic building material, four small finds, and some metalworking debris and animal bone from trenches in the area of the fort ditches.

SUMMARY

The majority of the Roman pottery dates after the late third century. There is some second-century samian and a first-century coin.

POTTERY

There is one sherd of Dressel 20 amphora (olive-oil carrying), 10 sherds of samian (generally small in size), and one sherd of burnt wallside mortarium. There are no fine wares, and 21 sherds of coarse wares

The fabrics represented are typical of those found at Wallsend Roman Fort.

Context	No.	Pottery	Date
111	1	samian	C2
112	5		post-Roman
113	13	calcite-gritted rounded everted rimmed cooking pot; Crambeck reduced ware flanged bowl	270+
118	4	1 sh early post-medieval	post-Roman
209	1	Early post-medieval	post-roman
210	12	BB1 plain-rimmed dish, grey ware flat-rimmed bowl	C2+
211	2	BB2 base	late C2+
215	5	calcite-gritted ware large cooking pot/storage jar	Prob. 270+
305	1	Samian	post-Roman

Table 1: Pottery spot dating (only the latest dated pottery type is mentioned)

CERAMIC BUILDING MATERIAL

There are 21 pieces of Roman tile, one fragment of modern pantile and 23 scraps.

Type	No.
Imbrex	4
Tegula	12
Box	3
Bessalis	2
Pantile	1
Scraps	23

Table 2: Ceramic building material

The assemblage includes the range of fabrics typical for Wallsend, including very pale orange and scraps over-fired to red and grey. The *tegulae* fragments include a wide flange, a tall flange, and an incomplete cutaway flange (113, 230). The most unusual tile is very thick and has what appears to be an extremely tall flange, but it is unfortunately incomplete (119). There are three fragments of box tile, one of which is a voussoir tile, 110mm wide. This has rough finger-marking keying and the remains of a small circular vent (119). There is a single example of a tile with a dog paw-print impression (113).

ANIMAL BONE

There was no evidence of bone working in the assemblage.

SMALL FINDS

There were two finds of Roman date and one of post-medieval date.

context	object
111	iron nail shank
112	post-medieval bottle
113	blue-green matt/glossy window glass

COIN

obv. IMP CAES DOMITIANVS AVG P[M]
Laureate head, right.

rev. TR P COS VII DES VIII PP
Wreath on curule chair.

Domitian, AD 81
Denarius, mint of Rome, *RIC* 18

METALWORKING DEBRIS

There were three fragments of ferrous metalworking debris, including a piece of probable hearth bottom (306).

DISCUSSION

Most of the pottery comes from the third outer ditch and is late third century or later in date (113, 215). The pottery from other features is second or third century in date. All are typical for the site. The voussoir box tile is an interesting addition to the small number of this type of tile recovered from Wallsend; so far the only other examples have been recovered from the area of the Branch Wall.

RECOMMENDATIONS

ARCHIVE REPORT

The pottery requires a fully quantified Ceramic Archive catalogue (as defined by the *Study Group for Roman Pottery* guidelines: Darling 1999). It could be incorporated into the existing database of Wallsend pottery, which includes identification by fabric and quantification by weight, sherd count and EVE (estimated vessel equivalents). Likewise the tile assemblage, which has some interesting elements to it, although small, should be added to the catalogue of tile from the site.

PUBLICATION REPORT

The assemblage is too small to be considered by itself, but information on the pottery and tile should be included in the existing reports of the finds from outside the fort. The coin requires full publication, but again should be included in the existing report.

CONDITION AND CURATION

The Roman pottery and two sherds of early post-medieval pottery should be retained; the rest can be discarded.

TILE

Most can be discarded; the tiles from 119, 230 and the tile with the paw-print from 113 should be retained.

ANIMAL BONE

The stratified material should be retained.

The post-medieval glass and the iron nail can be discarded.

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APPENDIX 4
PLATES

Plate 1. Trench 1, overview, showing ditch [114], the third outer defensive ditch of the fort, looking north-west (scale 1m)

Plate 2. Trench 1, showing ditch [114], the third outer defensive ditch of the fort looking north-east (scale 1m)

Plate 3. Trench 2, general, pre-excavation showing ditch [223], ditch re-cut [227] and ditch [216], the third outer defensive ditch of the fort in the background, looking north-east (scale 1m)

Plate 4. Trench 2, ditch [216], the third outer defensive ditch of the fort, north-west section (oblique view) , looking east (scale 1m)

Plate 5. Trench 2, ditch [223] and re-cut [227], NW facing section (scale 1m)

Plate 6. Trench 2, ditch [223] and re-cut [227], SSE facing section (oblique), looking north (scale 1m)

Plate 7. Trench 3, overview, looking east (scale 1m)

Plate 8. Trench 3, north-east facing section (scale 1m)

APPENDIX 5
WRITTEN SCHEME OF INVESTIGATION

Northumbrian Water

Segedunum Sewerage Connections

Written Scheme of Investigation for Archaeological Evaluation

March 2015

Amec Foster Wheeler Environment
& Infrastructure UK Limited

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Management systems

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Document revisions

No.	Details	Date
1	Final	12.03.2015

Contents

1. Introduction

This document has been produced by Amec Foster Wheeler E&I UK Ltd for the purpose of providing protocols and standards for archaeological investigations required ahead of a sewerage scheme linking Segedunum Museum to a new pumping station being constructed within the former Swan Hunter shipyard. It has been agreed with the Tyne and Wear County Archaeologist.

The scheme presented below is intended to define best practice for archaeological evaluation and recording and has been compiled with reference to the Chartered Institute for Archaeologists *Code of Conduct* (2014) and *Standard and Guidance Archaeological field evaluation* (2014).

The proposed works lie partly within an area which has previously excavated as part of the long running research excavations carried out by Tyne and Wear Museums in advance of, and as part of the construction of the present museum buildings.

2. Research aims and objectives

The need for archaeological investigation within the area has been established through discussion with the County Archaeologist due to the location of the work immediately to the east of Segedunum Roman Fort.

The proposed works are located to the east of the scheduled area, immediately outside the fort. The earlier excavations have not to date been published, but reference has been made to the archives of these excavations during the formulation of this written scheme. These excavations identified three parallel defensive ditches to the east of the fort, with a road or trackway leading to the east gate of the fort. Some evidence for settlement activity was identified close to this road. Archaeological remains were observed very close to the surface and other than where contained within deep cut features, such as the fort ditches, are not deeply stratified.

The proposed works are to be located within the car park at Segedunum, between the outermost two ditches, meaning that the sewerage spur connecting the sewer to the existing sewer at the museum must cross one of these defensive ditches. The principal sewerage connection can, however, be inserted with trenchless techniques on the same alignment but between the outer defensive ditches and below the maximum depth of archaeological deposits to avoid any further disturbance of buried archaeological features.

The information gained during the evaluation will enable impacts on the site to be minimised and contribute to the continuing protection of the monument. Research is an important element of development-led archaeological work. The North East Regional Research Framework (NERRF) highlights the need for further research into the path of the wall and its contiguous elements in urban Tyneside (Petts & Gerrard, 2006). The NERRF also identifies a number of key foci for research including into the function of forts as well as their impact on the environment and surroundings. The ditches, and the spaces in between them which will be targeted by the evaluation, may yield information which can contribute elements to these research questions. The Hadrian's Wall Research Framework (HWRF) also identifies and prioritises an agenda of key themes for research into the forts and their surroundings (Symonds & Mason, 2002). The Hadrian's Wall Management Plan (HWMP) sets out guidance in relation to the importance of Hadrian's wall, the need for understanding, monitoring and conservation. These works will also be placed into a wider context of site-specific research by the earlier works at Segedunum.

Taking these documents into account, the aims of the evaluation are therefore as follows. The aims have been cross-referenced to the relevant sections of the NERFF, HWMP and HWRF:

- To identify the location of the outer fort ditches and to provide information to allow disturbance of archaeological deposits to be minimised (HWMP Issue 7):
  - The primary aim of the evaluation is to locate the fort ditches accurately to allow for insertion of the new sewerage below the level of any archaeological deposits, thereby minimising any loss of archaeological interest;
  - Information on the location and nature of the fort ditches will feed into the evidence base underpinning proposals for the future management of the fort; and
  - The location and form of the fort ditches to the east of the fort is known only from unpublished excavations carried out in 1999 by Tyne and Wear Museums. The proposed work will provide an opportunity to consider the location of the fort ditches in the area south of these excavations and to allow the previous work to be more securely located.
- Archaeological Research Aim 1: Context:(HWMP Issue 9):
  - The results of the proposed works must be seen in the context of wider research on Hadrian's Wall and on Roman military sites in general; and
  - Reporting and analysis of the findings should reference the 1999 excavations and other pertinent excavations at forts along Hadrian's Wall in order to identify emerging trends and to

contrast observed differences which could help to provide more nuanced interpretation of the remains observed in the evaluation.

- Archaeological Research Aim 2: Understanding extramural settlement activity suggested by unpublished excavations:
  - S5: The forts and extramural settlement (HWRF);
  - A4: The forts and extramural settlement (HWRF);
  - Riii: The Roman military presence (NERFF).
  - The results of the proposed works can be compared with the results of the 1999 excavations to better understand the occupation of the area outwith the fort. This is particularly important as this area would have been on the north side of the Wall away from the more established *vicus* site to the south and west of the Fort; and
  - The work should identify whether occupation is primarily domestic or includes industrial/productive uses.
- Archaeological Research Aim 3: Understanding the past environment:
  - A5: Landscape and environment (HWRF); and
  - Palaeoenvironmental material recovered during the evaluation presents an opportunity to better establish the environment prevailing at the time that the fort was occupied, both on a micro-scale (e.g. whether the area 'outside' the Wall was kept clear, or whether it became overgrown) and on a macro-scale, informing an understanding of the environment of the wider area more generally.
- Archaeological Research Aim 4: To better understand the defensive ditches outside the fort:
  - Riii: The Roman military presence (NERFF); and
  - The sequence and lifespan of the Fort ditches in this area is not clearly understood. The 1999 excavations suggested phases of construction and infilling of the ditches, suggesting that the defensive scheme of this area evolved through the life of the Fort. The proposed works offer opportunities to consider this evolution.
- Archaeological Research Aim 5: To provide information to inform future management of the archaeological remains outside the schedule boundary:
  - Issue 2: The boundaries of the WHS and its Buffer Zone, Issue 4: Protection of the archaeological remains in urban areas (HWMP); and
  - By providing a better understanding of the potential archaeological resource, and the condition of the remains, the evaluation will provide information that will inform proposals for future management and interpretation of the Fort.

3. Method statement

3.1 Trench locations and objectives

Evaluation trenches are needed to inform the planning authority of the depth and course of the defensive ditches, to allow a route for the proposed sewerage that will present a minimum adverse effect on the surviving archaeological remains.

Archaeological evaluation trenches have been located to confirm the location and alignment of the defensive ditches which were identified in unpublished excavations by Tyne and Wear Museums in advance of the construction of the museum buildings.

The evaluation trenches will also allow more information to be gained about the archaeology within the area, which must be preserved through the compilation of a record of archaeological deposits, artefacts and ecofacts into an ordered archive, the analysis and interpretation of which, will be formally reported to the Tyne and Wear Historic Environment Record.

Study of the archived records of the 1999 excavation suggests that remains are likely to be relatively close to the surface, with the first archaeological horizon, comprising late-Roman or post-Roman dark earths and possible plough soils at approximately 0.3-0.5m below the existing car park surface, with boulder clay subsoil observed typically between 0.4 and 0.6m from the surface. The deepest observed feature in the excavations was the outer fort ditch, which was extended to approximately 1.2m depth from the existing car park surface. It is proposed only to excavate the fort ditches and deeper features far enough to confirm their location and nature to minimise any disturbance.

The archaeological investigation will comprise three test pits (Table 2.1).

Table 3.1 Trench locations, dimensions and objectives

	Dimensions	Objective	Contingency
Trench 1	10.0m x 1.0m	To investigate proposed sewerage connections to Segedunum museum buildings and define safe zone between the fort ditches for trenchless pipe laying	Trench length may be extended up to 3m to identify location of fort ditches or investigate archaeological remains which cannot be appropriately recorded within extent of excavation. Trench size reflects size of proposed sewer connection.
Trench 2	8.0m x 1.0m	To define safe zone between the fort ditches for trenchless pipe laying	Trench length may be extended up to 3m to identify location of fort ditches
Trench 3	4.0m by 4.0m	To identify appropriate location for drive pit	Trench may be extended up to 2m in any direction. Trench size reflects size of excavation required for engineering operation.

Trench locations are set out in the plan in Appendix A.

In the event that the initial investigation trenches do not provide sufficient information, and the defensive ditches are not encountered, the investigation pits may be extended. The archaeological contractor should identify an appropriate contingency for this event.

Trenches will be stripped to the first archaeological horizon or to undisturbed subsoil by a back-acting machine equipped with a toothless bucket.

General standards for archaeological evaluation are set out below.

3.2 Fieldwork standards

General standards

All work will be carried out in compliance with the relevant codes of practice of the Chartered Institute for Archaeologists (CIfA) and will follow the CIfA *Standard and Guidance Archaeological field evaluation* (2014).The work will be undertaken according to English Heritage Guidelines - Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide, Project Planning Notes and Technical Guides 2006 (www.english-heritage.org.uk/publications). The work will be undertaken according to MoRPHE Project Planning Notes 2006 - PPN3 – Archaeological Excavation and PPN6 – Development of Procedural standards and guidelines for the historic environment.

The excavation will be carried out by a suitably qualified and experienced archaeological organisation. All staff will be suitably qualified and experienced for their project roles and will understand the project aims and methodologies.

The work will record and environmentally sample any archaeological deposits of importance. Where archaeological deposits are encountered, appropriate records will be compiled in accordance with the standards and guidelines set out below. Where archaeological deposits are not encountered representative sequence descriptions will be recorded and relevant locations shown on an accurate site plan.

A sampling strategy has been agreed with the English Heritage Regional Scientific Advisor and with reference to the stated research aims. Environmental sampling will prioritise the following features and deposits:

- Intact domestic and occupation deposits (e.g. hearths, flues, drains within buildings);
- Ditch deposits including significant organic deposits (e.g. waterlogged deposits, dumps of refuse material or accumulations of organic material);
- Industrial deposits (hearths, deposits of slag other wastes/residues);
- Deposits associated with discrete floor or working surface deposits; and
- Features or deposits which appear to pre-date or post-date the Roman occupation, where sampling should prioritise opportunities for recovery of material suitable for scientific dating techniques.

Other deposits will be sampled where it is considered that samples have the potential to inform the research aims of the investigation.

All identified finds and artefacts will be collected. Certain classes of material, such as modern pottery and building material, will be discarded after recording. All recovered artefacts will be stored in the appropriate packaging and storage conditions.

Archaeological deposits will be sampled systematically with bulk samples where appropriate.

A site diary or day book will be maintained to include details of liaison and monitoring meetings, visits, a record of staff on site and details of progress on a daily basis.

Any significant variations to the proposed methodology beyond this will be discussed and agreed with David Heslop, the Tyne & Wear Archaeology Specialist in advance of implementation.

3.3 Recording

The works subject to observation will be accurately related to the Ordnance Survey grid and located on an appropriately scaled map of the area. All archaeological deposits and features, representative levels for the

current ground surface and base of the intervention will be recorded with an above ordnance datum (aOD) level, as reasonably practicable.

Hand excavation, recording and environmental sampling (as stipulated below) of deposits down to the depth specified above.

Any modern overburden or levelling material can be machined-off using a wide toothless ditching bucket under strict archaeological supervision and the remaining deposits are to be excavated by hand.

All faces of the trench that require examination or recording will be cleaned.

Excavation is to be carried out with a view to avoid damage to any archaeological features which appear to worthy of preservation in-situ.

Excavation is to be carried out by single context planning and recorded on pro forma context sheets. Features over 0.5 m in diameter can be half sectioned.

Environmental sampling (and where relevant scientific dating) are compulsory parts of the evaluation exercise and set out in Appendix B.

Samples will be taken of bricks from any brick-built structures. The dimensions of the bricks and the type of bonding must be recorded.

Scientific investigations should be undertaken in a manner consistent with "The Management of Archaeological Projects", English Heritage 1991 and with "Archaeological Science at PPG16 Interventions: Best Practice for Curators and Commissioning Archaeologists", English Heritage, 2003. Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Jacqui Huntley, English Heritage Regional Advisor for Archaeological Science (jacqui.huntley@english-heritage.org.uk or 07713 400387) before the evaluation begins. See Appendix B for more information.

See Appendix B for guidance on procedures relating to human remains and for guidance on Treasure Act procedures.

A full and proper record (written, graphic and photographic as appropriate) will be made for all work. Context descriptions will be recorded on standardised record sheets. Where stratified deposits are encountered a "Harris"-type matrix will be compiled during the course of the excavation.

Accurate scale plans and section drawings will be drawn at 1:50, 1:20 and 1:10 scales as appropriate.

Finds from all excavated levels will be labelled and bagged on site. Post-1800 unstratified pottery may be discarded on site with a small sample retained for dating evidence as required.

A photographic record will be maintained to illustrate the principal features and finds both in detail and in a general context. The photographic record will also include working shots in a digital format to represent more generally the nature of the fieldwork. Digital photographs with a resolution of at least 5MP will be used. For maximum flexibility digital Single Lens Reflex cameras offer the best solution for power users. 6 megapixels should be considered a minimum requirement. When photographing with digital SLR cameras, there is often a magnifying effect due to smaller sensor sizes.

If the JPEG (Joint Photographic Experts Group) setting is used, set the camera for the largest image size with least compression. The JPEG format discards information in order to reduce file size. If the image is later manipulated, the quality will degrade each time you save the file.

For maximum quality, the preferred option is that the RAW (camera-specific) setting is used. This allows all the information that the camera is capable of producing to be saved. Because all of the camera data is preserved, post processing can include colour temperature, contrast and exposure compensation adjustments at the time of conversion to TIFF (Tagged Interchangeable File Format), thereby retaining maximum photographic quality.

The RAW images must be converted to TIFF before they are deposited with the HER and TWAS because special software from the camera manufacturer is needed to open RAW files.

Uncompressed formats such as TIFF are preferred by most archives that accept digital data.

3.4 Staffing

All stages of the work will be carried out by staff of sufficient competence and experience to perform the tasks to recognised professional standards. All staff will be aware of the requirements of the specification and will understand the aims and methodologies of the project.

3.5 Notification

Appropriate notice will be given to David Heslop, the Tyne & Wear Archaeology Specialist to allow for monitoring of the archaeological works. The archaeological contractor will inform the County Archaeologist of the start and end dates of the evaluation. They will also keep the County Archaeologist informed as to the progress on site. The County Archaeologist must be informed of the degree of archaeological survival and of any significant finds. The principal contractor will give the County Archaeologist reasonable access to the development to undertake monitoring.

The appropriate local archive depository will be contacted to discuss archiving requirements and deposition of records and artefacts, prior to work commencing.

3.6 Reinstatement

Unless otherwise agreed with the Tyne and Wear Archaeologist, trenches will normally be backfilled with arisings laid on geotextile membrane on completion of archaeological works pending restoration to 'as existing' condition by the principal contractor. Where specifically agreed in writing with the Tyne and Wear County Archaeologist, Trench 1 and Trench 3 may be left open to allow pipelaying and directional drilling works to proceed on completion of archaeological works. In this event, responsibility for ensuring that open excavations remain secure will rest with the principal contractor.

3.7 Post-excavation analyses

All retained finds will be subject to analyses appropriate to their character and condition and the aims of the project.

Analyses will be carried out by suitably qualified and experienced staff, who will be appraised of the project design before commencing work.

4. Reporting and archiving

4.1 Presentation of results

The Archaeological Contractor must produce an interim report of 200 words minimum, two weeks after the completion of the field-work, for the Client and the Planning Authority, with a copy for information to the County Archaeologist. This will contain the recommendations for any further work needed on site.

The production of Site Archives and Finds Analysis will be undertaken according to English Heritage Guidelines - Management of Research Projects in the Historic Environment (MoRPHE) 2006.

A full archive report, with the following features should be produced within six months of the completion of the field-work. All drawn work should be to publication standard. The report must include:

- Location plans of trenches and grid reference of site;
- Site narrative – interpretative, structural and stratigraphic history of the site;
- Plans showing major features and deposit spreads, by phase, and section locations;
- Sections of the two main trench axes and through excavated features with levels;
- Elevation drawings of any walls etc. revealed during the excavation;
- Artefact reports – full text, descriptions and illustrations of finds;
- Tables and matrices summarising feature and artefact sequences;
- Archive descriptions of contexts, grouped by phase (not for publication);
- Deposit sequence summary (for publication/deposition);
- Colour photographs of trenches and of archaeological features and finds;
- Laboratory reports and summaries of dating and environmental data, with collection methodology;
- A consideration of the results of the field-work within the wider research context (ref. NERRF);
- Recommendations for further work on site, or further analysis of finds or environmental samples; and
- Copy of this specification.

One bound and collated copy of the report needs to be submitted:

- for deposition in the County HER.

Three digital copies (pdf of the report on CD) must be submitted:

- one for the commissioning client,
- one for deposition in the County HER at the address below. This CD will also include all of the digital images as TIFFs and the accompanying metadata; and
- one for Mike Collins, English Heritage, (Bessie Surtees House, 41-44 Sandhill, Newcastle upon Tyne NE1 3JF)

PLEASE DO NOT ATTACH THE HER'S CD TO THE PAPER REPORT AS THEY ARE STORED SEPARATELY

The report and CD for the HER must be sent by the archaeological consultant or their contractor directly to the address below. If the report is sent via the planning department, every page of the report will be stamped

with the planning application number which ruins the illustrations. The HER is also often sent a photocopy instead of a bound colour original which is unacceptable.

4.2 Publication

Given the location and nature of the works, formal publication of some or all of the work may be appropriate. This requirement will be reviewed by the Tyne and Wear County Archaeologist and the Hadrian's Wall Archaeologist following the submission of the archive report and any reporting on subsequent phases of fieldwork.

Any requirement for and format of publication will be subject to the editorial policies of the appropriate journal.

4.3 Post photography processing

The submitted digital images must be 'finished', ready to be archived.

Post photography processing workflow for RAW images:

- 1 Download images;
- 2 Edit out unwanted shots & rotate;
- 3 Batch re-number;
- 4 Batch caption;
- 5 Batch convert to TIFF;
- 6 Edit in Photoshop or similar;
- 7 Save ready to burn to CD;
- 8 Burn to CD; and
- 9 Dispatch.

Batch caption – the image files should be named to reflect their content, preferably incorporating the site or building name. Consistent file naming strategies should be used. It is good practice not to use spaces, commas or full stops. For advice, go to http://ads.ahds.ac.uk/project/userinfo/deposit.html#filenaming . In order to find images at a future date and for copyright the site or building name, photographer's name and/or archaeological unit etc must be embedded in the picture file. The date can be appended from the EXIF data. Metadata recording this information must be supplied with the image files. A list of images, their content and their file names should be supplied with the image files on the CDs.

Batch conversion to TIFF – any white balance adjustments such as 'daylight' or 'shade' be required then this can be done as part of the conversion process. Ensure that any sharpening settings are set to zero.

Edit in 'Imaging' software such as Photoshop – tonal adjustments (colour, contrast) can be made. Rotate images where necessary, crop them to take out borders, clean the images to remove post-capture irregularities and dust. Check for sensor dust at 100% across the whole image.

Save ready for deposit – convert to TIFF and save. Retain the best colour information possible – at least 24 bit.

If the JPEG setting has been used and the image has been manipulated in any way it should be saved as a TIFF to prevent further image degradation through JPEGing.

Burn to CD – the NMR recommends using Gold CDs. Use an archive quality disk such as MaM-E gold. Gold disks have a lower burn speed than consumer disks.

Disks should be written to the 'Single Session ISO9660 – Joliet Extensions' standard and not UDF/Direct CD. This ensures maximum compatibility with current and future systems.

Images should be placed in the root directory not in a folder.

The CD will be placed in a plastic case which is labelled with the site name, year and name of archaeological contractor.

For more guidance on digital photography see:

- Digital Imaging Guidelines by Ian Leonard, Digital Archive Officer, English Heritage 22 September 2005);
- Understanding Historic Buildings – A guide to good recording practice, English Heritage, 2006;
- Duncan H. Brown, 2007, "Archaeological Archives – A guide to best practice in creation, compilation, transfer and curation";
- IFA, Guidance on the use and preservation of digital photographs;
- FISH (Forum on Information Standards in Heritage), September 2006 v.1, A Six Step Guide to Digital Preservation, FISH Fact Sheet No. 1;
- Visual Arts Data Service and Technical Advisory Service for Images, Creating Digital Resources for the Visual Arts: Standards and Good Practice http://vads.ahds.ac.uk/guides/creating_guide/contents.html; and
- AHDS Guides to Good Practice – Julian Richards and Damian Robinson (eds), Digital Archives from Excavation and Fieldwork: Guide to Good Practice, Second Edition.

Printing the images

In view of the currently unproven archival performance of digital data it is always desirable to create hard copies of images on paper of archival quality.

A selection of the images will be printed in the finished report for the HER, two images per A4 page.

When preparing files for printing, a resolution of 300dpi at the required output size is appropriate.

A **full set** of images will also be professionally printed in black and white and colour for submission as part of the site archive.

Use processing companies that print photos to high specifications. Commercial, automatic processing techniques do not meet archival standards and must not be used.

All prints for the archive must be marked on the back with the project identifier (e.g. site code) and image number.

Store prints in acid-free paper enclosures or polyester sleeves (labelled with image number).

Include an index of all photographs, in the form of running lists of image numbers.

The index should record the image number, title and subject, date the picture was taken and who took it.

The print sleeves and index will either be bound into the paper report or put in an A4 ringbinder which is labelled with the site name, year and archaeological unit on its spine.

4.4 Finds processing and storage

The Archaeological Contractor will process and catalogue the finds in accordance with Museum and Galleries Commissions Guidelines (1992) and the UKIC Conservation Guidelines, and arrange for the long term disposal of the objects on behalf of the Client. A catalogue of finds and a record of discard policies, will be lodged with the finds for ease of curation.

Finds shall be recorded and processed in accordance with the IFA Guidelines for Finds Work.

Finds will be assessed by an experienced finds specialist.

See 'Investigative Conservation. Guidelines on how the detailed examination of artefacts from archaeological sites can shed light on their manufacture and use', English Heritage, 2008.

Human and animal bone assemblages should be assessed by a recognised specialist (see Appendix B)

Industrial slag and metal working debris will be assessed by a specialist.

Assessment should include x-radiography of all iron objects (after initial screening to exclude recent debris) and a selection of non-ferrous artefacts (including all coins). Refer to "Guidelines on the x-radiography of archaeological metalwork, English Heritage, 2006.

Brick dimensions will be measured and a note made of the bonding material.

If necessary, pottery sherds and bricks should be recommended for Thermo-luminescence dating. See 'Luminensence Dating: guidelines on using luminescence dating in archaeology', English Heritage, 2008.

Inductively-coupled plasma spectroscopy (ICPS) and thin sectioning can be used to establish the chemical composition of clay fabric (pottery), which helps to locate production sites and identify the products of known sites.

Finds processing, storage and conservation methods must be broadly in line with current practice, as exemplified by the IFA "Standard and guidance for the collection, documentation, conservation and research of archaeological materials", 2001. Finds should be appropriately packaged and stored under optimum conditions, as detailed in the RESCUE/UKIC publication "First Aid for Finds" (Watkinson and Neal 1998). Proposals for ultimate storage of finds should follow the UKIC publication "Guidelines for the Preparation of Excavation Archives for Long-term Storage" (Walker 1990). Details of methodologies may be requested from the Archaeological Contractor.

Other useful guidance – "A Strategy for the Care and Investigation of Finds", English Heritage, 2003, "Finds and Conservation Training Package", English Heritage, 2003.

All objects must be stored in appropriate materials and conditions to ensure minimal deterioration. Advice can be sought from Jacqui Huntley of English Heritage (07713 400387) where necessary.

4.5 Archiving

The archive should be a record of every aspect of an archaeological project – the aims and methods, information and objects collected, results of analysis, research, interpretation and publication. It must be as complete as possible, including all relevant documents, records, data and objects (Brown 2007).

The site archive (records and materials recovered) should be prepared in accordance with Managing Archaeological Projects, Second Edition, 5.4 and appendix 3 (HBMC 1991), MoRPHE Project Planning Notes 2006 PPN3 – Archaeological Excavation, "Archaeological documentary archives" IFA Paper No. 1, "Archaeological Archives – creation, preparation, transfer and curation" Archaeological Archives Forum etc., Guidelines for the Preparation of Excavation Archives for Long Term Storage (UKIC 1990) and "Archaeological Archives – A guide to best practice in creation, compilation, transfer and curation" by Duncan H. Brown, Archaeological Archives Forum, July 2007.

Documentary archive

The documentary archive comprises all records made during the archaeological project, including those in hard copy and digital form.

This should include written records, indexing, ordering, quantification and checking for consistency of all original context sheets, object records, bulk find records, sample records, skeleton records, photographic records (including negatives, prints, transparencies and x-radiographs), drawing records, drawings, level books, site note-books, spot-dating records and conservation records, publication drafts, published work, publication drawings and photographs etc.

A summary account of the context record, prepared by the supervising archaeologist, should be included.

All paper-based material must at all times be stored in conditions that minimise the risk of damage, deterioration, loss or theft.

Do not fold documents

Do not use self-adhesive labels or adhesive or tape of any kind

High quality paper (low-acid) and permanent writing materials must be used.

Original drawings on film must be made with a hard pencil, at least 4H.

Do not ink over original pencil drawings.

Use polyester based film for drawings (lasts longer than plastic).

Store documents in acid-free, dust-proof cardboard boxes

Store documents flat

All documents must be marked with the project identifier (e.g. site code) and/or the museum accession number.

All types of record must use a consistent terminology and format.

Use non-metal fastenings, and packaging and binding materials that ensure the longevity of documents.

Copies of reports and appropriate drafts, with associated illustrative material, must be submitted for inclusion with the archive.

Material archive

The material archive comprises all objects (artefacts, building materials or environmental remains) and associated samples of contextual materials or objects.

All artefacts and ecofacts retained from the site must be packed in appropriate materials.

All finds must be cleaned as appropriate to ensure their long-term survival.

All metal objects retained with the archive must be recorded by x-radiograph (except gold or lead alloys or lead alloys with a high lead content and objects too thick to be x-rayed effectively etc.)

The archive should include all environmental remains recovered from samples or by hand, all vertebrae remains not used for destructive analysis, environmental remains extracted from specialist samples (such as pollen preparations in silicone oil).

All finds must be marked or labelled with the project and context identifiers and where relevant the small-finds number.

Use tie-on rot-proof labels where necessary.

Bulk finds of the same material type, from the same context, may be packed together in stable paper or polythene bags.

Mark all bags on the outside with site and context identifiers and the material type and include a polyethylene label marked with the same information.

Use permanent ink on bags and labels.

Sensitive finds must be supported, where appropriate, on inert plastic foam or acid-free tissue paper. It is not advisable to wrap objects in tissue as the unwrapping could cause damage.

The archive will be placed in a suitable form in the appropriate museum, the Great North Museum. Contact Andrew Parkin at the Museum of Antiquities (0191 2228996).

A letter will be sent to the County Archaeologist within six months of the report having been submitted, confirming where the archive has been deposited.

Digital archive

Copy of the report on CD as a pdf plus all of the digital images as TIFFs. See MoRPHE Technical Guide 1 – Digital Archiving & Digital Dissemination 2006.

Archaeology Data Service

The digital archive including the image files can, if the appointed archaeologist and commissioning client choose to, be deposited with the ADS (The Archaeology Data Service) which archives, disseminates and catalogues high quality digital resources of long-term interest to archaeologists. The ADS will evaluate datasets before accepting them to maintain rigorous standards (see the ADS Collections Policy). The ADS charge a fee for digital archiving of development-led projects. For this reason deposition of the images with the ADS is optional.

Archaeology Data Service
Department of Archaeology
University of York
King's Manor
York
YO1 7EP
01904 433 954 Web: http://ads.ahds.ac.uk

OASIS

The Tyne and Wear County Archaeologist supports the Online Access to the Index of Archaeological Investigations (OASIS) project. This project aims to provide an online index/access to the large and growing body of archaeological grey literature, created as a result of developer-funded fieldwork.

The archaeological contractor is therefore required to register with OASIS and to complete the online OASIS form for their evaluation at http://www.oasis.ac.uk/. Please ensure that tenders for this work takes into account the time needed to complete the form.

Once the OASIS record has been completed and signed off by the HER and NMR the information will be incorporated into the English Heritage Excavation Index, hosted online by the Archaeology Data Service.

The ultimate aim of OASIS is for an online virtual library of grey literature to be built up, linked to the index. The unit therefore has the option of uploading their grey literature report as part of their OASIS record, as a Microsoft Word document, rich text format, pdf or html format. The grey literature report will only be mounted by the ADS if both the unit and the HER give their agreement. The grey literature report will be made available through a library catalogue facility.

Please ensure that you and the contractor understand this procedure. If you choose to upload your grey literature report please ensure that your client agrees to this in writing to the HER at the address below.

For general enquiries about the OASIS project aims and the use of the form please contact: Mark Barratt at the National Monuments Record (tel. 01793 414600 or oasis@english-heritage.org.uk). For enquiries of a technical nature please contact: Catherine Hardman at the Archaeology Data Service (tel. 01904 433954 or oasis@ads.ahds.ac.uk). Or contact the Tyne and Wear Archaeology Officer at the address below.

5. Health and safety

Health and Safety will take priority over all other requirements. A risk assessment will be agreed prior to commencing works. A conditional aspect of all archaeological work is both safe access to the area of work and a safe working environment.

The project will be carried out in accordance with safe working practices and under the defined Health and Safety Policy of the client. Staff will attend general and/or site-specific health and safety inductions as required by the client.

6. References

- Archaeology Data Service 2000 *Digital Archives from Excavation and Fieldwork: Guide to Good Practice 2nd ed.*
- Brown, D.H. 2007. *Archaeological Archives – A guide to best practice in creation, compilation, transfer and curation.*
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- English Heritage 2002 *Environmental Archaeology* Swindon: English Heritage.
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- English Heritage 2003 *A Strategy for the Care and Investigation of Finds* Swindon: English Heritage.
- English Heritage 2003 *Finds and Conservation Training Package* Swindon: English Heritage.
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- English Heritage 2004 Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record Swindon: English Heritage.
- English Heritage 2006 Management of Research Projects in the Historic Environment (MoRPHE) Swindon: English Heritage.
- English Heritage 2006 *Archaeomagnetic dating* Swindon: English Heritage.
- English Heritage 2006 Understanding Historic Buildings – A guide to good recording practice Swindon: English Heritage.
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- English Heritage and Archaeological Leather Group 1995 *Guidelines for the care of waterlogged archaeological leather* Swindon: English Heritage.

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- Historical Metallurgy Society 2008 *Metals and metalworking: a research framework for archaeometallurgy.*
- IFA n.d. Guidance on the use and preservation of digital photographs.
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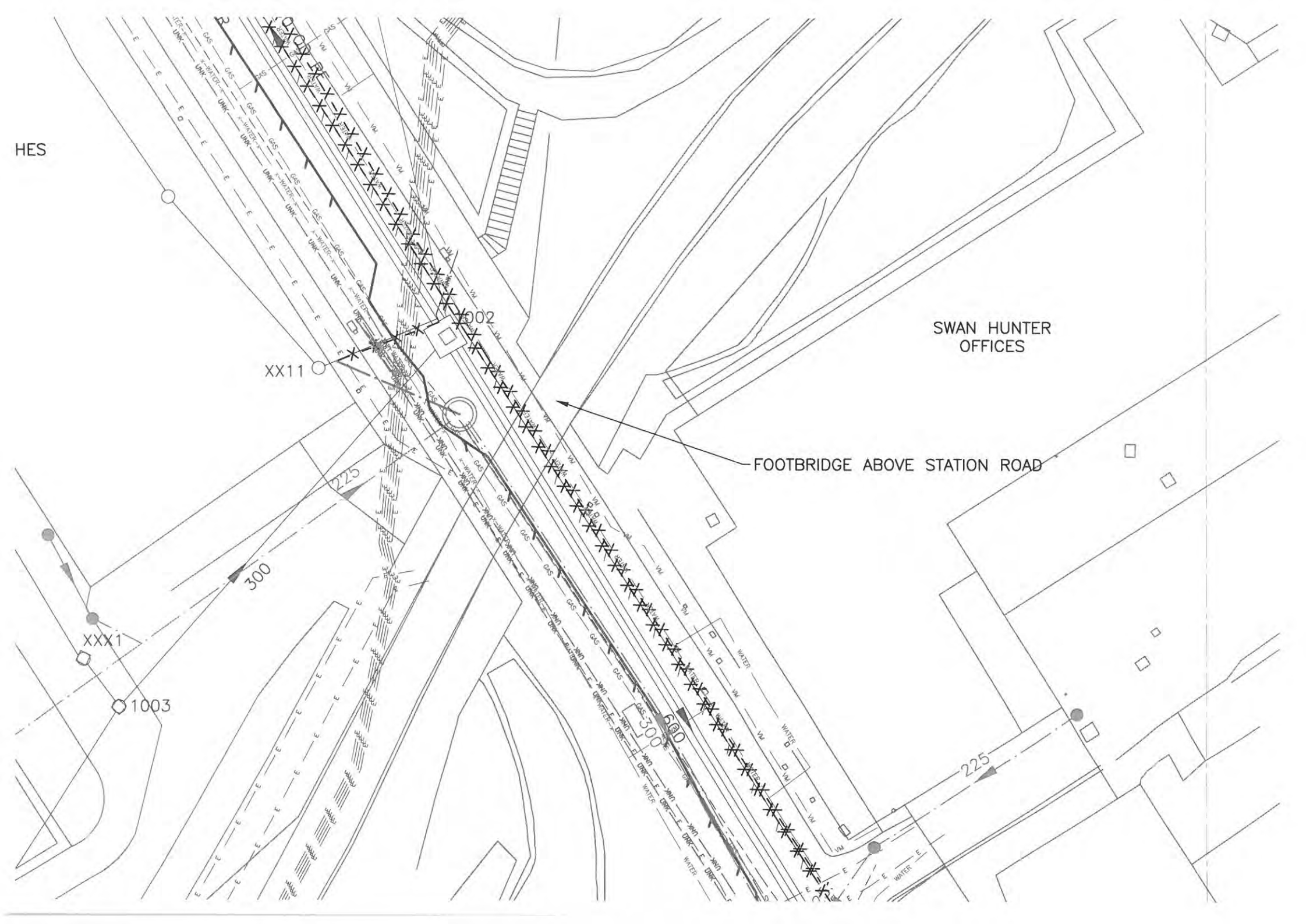
- Petts, D & Gerrard, 2006 *Shared Visions: The North-East Regional Research Framework for the Historic Environment.*
- Roberts, C. 2009 *Human Remains in archaeology: a handbook.* CBA Practical Handbooks in Archaeology No. 19.
- Symonds, M.F.A & Mason, D.J.P 2002 Frontiers of Knowledge: A research framework for Hadrian's Wall, part of the Frontiers of the Roman Empire World Heritage Site Vol II: Agenda and Strategy.
- The Church of England and English Heritage 2005 *Guidance for best practice for treatment of human remains excavated from Christian burial grounds in England.*
- Thompson, J. 1998 Bodies, minds and human remains in Cox, M. (ed) 1998 *Grave concerns: Death and Burial in England 1700-1850* pp 197-201.
- UKIC 1990 *Guidelines for the Preparation of Excavation Archives for Long Term Storage.*
- Visual Arts Data Service and Technical Advisory Service for Images 2011 *Standards and Good Practice* http://vads.ahds.ac.uk/guides/creating_guide/contents.html.

Appendix A
Plan of site with archaeological investigation pit locations


HES
SWAN HUNTER
OFFICES
FOOTBRIDGE ABOVE STATION ROAD
XX11
1002
XXX1
1003
225
300
600
300
225

Appendix B
Specifications

Environmental sampling, scientific analysis and scientific dating

This is a compulsory part of the evaluation exercise

Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Jacqui Huntley, English Heritage Advisor for Archaeological Science (07713 400387) **before** the evaluation begins. The sampling strategy should include a reasoned justification for selection of deposits for sampling.

Scientific investigations should be undertaken in a manner consistent with "The Management of Archaeological Projects", English Heritage 1991 and with "Archaeological Science at PPG16 Interventions: Best Practice for Curators and Commissioning Archaeologists", English Heritage, 2004. See also 'Environmental Archaeology: A guide to the theory and practice of methods, from sampling and recovery to post excavation, English Heritage, 2002.

English Heritage guidance documents on archaeological science can be downloaded as pdf files from www.helm.org.uk or www.English-Heritage.org.uk > Learning and Resources > Publications > Free Publications.

See also the Environmental Archaeology Bibliography (EAB):http://ads.ahds.ac.uk/catalogue/specColl/eab_eh_2004/ and the NMR sciences thesaurus: http://thesaurus.english-heritage.org.uk/thesaurus.asp?thes_no=560

There must be full specialist liaison throughout the project – this need not necessarily be face-to-face.

Sampling should be demonstrated to be both fit for purpose and in-line with the aims and objectives of the project.

The choice of material for assessment should be demonstrated as adequate to address the objectives.

Evaluations and assessment of scientific material should provide clear statements of their potential and significance in addition to descriptive records. These statements should relate to the original objectives but may also lead to new or modified objectives.

Post excavation analysis and interpretation requires sufficient information exchange and discussion to enable scientific specialists to interpret their material within the established intellectual framework.

Archaeological and scientific analyses should be integrated as fully as possible. It is not acceptable to leave the scientific analyses simply as appendices.

Archive reports should include full data from all specialist materials. All reports, including any publications, must present sufficient primary data to support the conclusions drawn.

{From '10 principles of good practice in archaeological science' by English Heritage 2010}.

Types of sample

Flotation samples are used to recover charred and mineral-replaced plant remains, small bones, industrial residues etc. Such samples should be whole earth, 40-60 litres or 100% of small features. The flot mesh size should be 0.25-0.3mm. The residue sieve size should be 0.5-1mm. The flot and <2mm residue should be sorted under the microscope. >2mm residues can be sorted by eye.

Coarse-sieved samples are used to recover small bones (such as bird and fish), bone fragments, molluscs and small finds (beads, pottery, coins etc). Such samples should be 100 or more litres, wet or dry sieved, minimum mesh 2mm. Specialist advice is recommended.

Other types of sample are monoliths, specialist, cores and small spot. These are taken for specific reasons and need specialists.

Aims and objectives

Aims of environmental sampling – to determine the abundance/concentration of the material within the features and how well the material is preserved, to characterise the resource (the site) and each phase, to determine the significance of the material and its group value, what crop processing activities took place on the site? What does this tell us about the nature of the site? Is there any evidence for changes in the farming practice through time? How did people use this landscape? Can we place certain activities at certain locations within the site? Function and date of individual features such as pits, hearths etc. Are the charred assemblages the result of ritual deposition or rubbish? Is the charcoal the result of domestic or industrial fuel?

Deposits should be sampled for retrieval and assessment of the preservation conditions and potential for analysis of biological remains (English Heritage 2002). Flotation samples and samples taken for coarse-mesh sieving from dry deposits should be processed at the time of fieldwork wherever possible. Sieving recovers fish, amphibian, small bird and mammal bone, small parts of adult mammals and young infused bones which may be under-represented otherwise. However it is noted that sticky clay soils in this region make sieving difficult. Discuss the potential for sieving with Regional Advisor for Archaeological Science.

Environmental samples (bulk soil samples of 30-40 litres volume) will be collected by the excavator from suitable (i.e. uncontaminated) deposits. It is suggested that a large number of samples be collected during evaluation from which a selection of the most suitable (uncontaminated) can be processed. All tenders will give a price for the assessment, full analysis, report production and publication per sample.

The full 30-40 litre sample must be assessed by the laboratory, not just a small sub-sample.

The following information should be provided with the environmental samples to be processed – brief account of nature and history of the site, aims and objectives of the project, summary of archaeological results, context types and stratigraphic relationships, phase and dating information, sampling and processing methods, sample locations, preservation conditions, residuality/contamination etc.

Laboratory processing of samples shall only be undertaken if deposits are found to be reasonably well dated, or linked to recognisable features and from contexts the derivation of which can be understood with a degree of confidence.

A range of features, and all phases of activity, need to be sampled for charred plant remains and charcoal. Aceramic features should not be avoided as the plant remains from these features may help to date them. Deep features should be sampled in spits to pick up changes over time. Part or all of each of the contexts should be processed. In general samples should be processed in their entirety. All flots should be scanned, and some of the residues.

Scientific dating

Deposits will be assessed for their potential for radiocarbon, archaeomagnetic and Optically Stimulated Luminescence dating. See 'Archaeomagnetic Dating: Guidelines on producing and interpreting archaeomagnetic dates', English heritage, 2006 and 'Luminescence Dating: guidelines on using luminescence dating in archaeology', English Heritage, 2008.

Timbers will be assessed for their potential for dendrochronology dating. Sampling should follow procedures in "Dendrochronology: guidelines on producing and interpreting dendrochronological dates", Hillam, 1998.

All tenders will quote the price of these techniques per sample.

Industrial activity

Where there is evidence for industrial activity, macroscopic technological residues should be collected by hand. Separate samples should be collected for micro-slags (hammer-scale and spherical droplets). Guidance should be sought from the English Heritage Regional Science Adviser on the sampling strategy for metalworking features and advice on cleaning and packaging. Specialist on-site advice must be sought on identification of metalworking features. Slag and metal working debris must be assessed by a specialist. Scientific analysis (such as x-ray fluorescence, chemical analysis, metallography or scanning electron

microscope) of slag can provide information on the melting temperature, chemical composition (is it iron, zinc, copper etc), microstructure (the type and shape of the crystals), physical properties (the hardness or viscosity), isotopic composition (strontium_87 or strontium_88 etc) and mineralogical composition. See,

- "Archaeomagnetic dating", English Heritage, 2006
- "Guidelines on the X-radiography of archaeological metalwork", English Heritage, 2006.
- Historical Metallurgy Society, 2008, "Metals and metalworking: a research framework for archaeometallurgy".
- Centre for Archaeology Guidelines on 'Archaeometallurgy' 2001.
- 'Science for Historic Industries: Guidelines for the investigation of 17th to 19th century industries', English Heritage, 2006.

Buried soils and sediments

Buried soils and sediment sequences should be inspected and recorded on site by a recognised geoarchaeologist. Procedures and techniques in the English Heritage document "Environmental Archaeology", 2002 and "Geoarchaeology", 2004 should be followed.

See also 'Geoarchaeology. Using earth sciences to understand the archaeological record', English Heritage, 2007.

Wood

Sampling strategies for wooden structures should follow the methodologies presented in "Waterlogged wood. Guidelines on the recording, sampling, conservation and curation of waterlogged wood" R. Brunning, 1996. If timbers are likely to be present on your site, contact a wood specialist beforehand. Pre-excavation planning – determine questions to ask, agree on a sampling strategy, allocate reasonable time and budget. Soil samples should be taken of the sediments surrounding the timber. Keep the timbers wet! Record them asap on-site – plan, photograph, record the size and orientation of the wood (radial, tangential,transverse), any toolmarks, joints, presence of bark, insect damage, recent breaks, and if another piece of wood was on top of or below the piece sampled. Both vertical and horizontal positioning of wattling must be recorded. Wood samples can provide information on woodland management such as medieval coppicing, type of taxa (native or foreign), conversion technology (how the wood was turned into planks), building techniques and type of tools used.

Suitable samples should be submitted for dendrochronological dating. See English Heritage guidelines, 2004, "Dendrochronology".

Leather and organic materials

Waterlogged organic materials should be dealt with following recommendations in "Guidelines for the care of waterlogged archaeological leather", English Heritage and Archaeological Leather Group 1995.

Human remains

Human remains must be treated with care, dignity and respect.

Excavators must comply with the relevant legislation (essentially the Burial Act 1857) and local environmental health concerns. If found, human remains must be left in-situ, covered and protected. The archaeological contractor will be responsible for informing the police, coroner, local Environmental Health department and the County Archaeologist. If it is agreed that removal of the remains is essential, the archaeological contractor will apply for a licence from the Home Office and their regulations must be complied with.

The excavation area must be shielded from public view with screens.

The excavation of human remains is a delicate and time consuming operation. The process can take one or two days per skeleton. If the skeleton cannot be excavated all in one day cover it with plastic sheeting

overnight to prevent it from drying out. The remains should be excavated as completely as possible to give the bioarchaeologist the maximum amount of data.

A bioarchaeologist should be employed for any burial excavation from the start of the project.

A basic diagram of a skeleton should be available on site for staff to consult (such as that in Abrahams et al, 2008, McMinn's the human skeleton).

Once the top of a skeleton is reached, excavation will be undertaken using delicate tools such as paintbrushes, teaspoons, dental equipment and plasterers' leaves.

Recover all teeth, hand and foot bones.

Excavate the pubic symphysis of the pelvis with care as it is needed for age estimation of adults.

The ends of the ribs that meet the sternum are useful for age estimation of adults.

There will be a possibility that gall, bladder and kidney stones may survive.

Sesamoid bones may be present in the hands and feet, calcified cartilages in the neck, on the ribs and on the hyoid bone in the neck.

Foetal bones may be present in the abdominal area of female skeletons.

The bones should be shaded from strong sunlight so they do not dry out and crack.

Bones should be drawn at 1:10 using a planning frame. Manual and digital photographs should be taken with a scale and a magnetic north arrow clearly visible. 3D recording using an EDM may be undertaken.

Site inspection by a recognised osteologist is desirable for isolated burials and essential for cemeteries. The remains will be recorded in-situ and subsequently lifted, washed in water (without additives). They will be marked and packed to standards compatible with "Excavation and post-excavation treatment of cremated and inhumed human remains", McKinley and Roberts, 1993. After excavation, the remains will be subject to specialist assessment.

Analysis of the osteological material should take place according to published guidelines "Human Remains from Archaeological Sites, Guidelines for producing assessment documents and analytical reports, English Heritage, 2002.

Some of the potential benefits from the study of human skeletons – demography, growth profiles, patterns of disease, genetic relationships, activity patterns, diet, burial practices, human evolution. New scientific techniques available include DNA and stable isotope analyses.

Diseases which yield ancient DNA – leprosy, syphilis, tuberculosis, mycobacterium bovis (animal form of TB passed to humans when they shared a living space from Neolithic period onwards).

Cremation destroys the crown of the tooth so it cannot be dated (the closure of the cranium vault can be used in adults for dating instead). Cremation also fragments bone, distorts it due to lack of water, shrinks the bone, causes microstructural alteration and destroys organic components (so DNA analysis not possible).

The final placing of the remains after scientific study and analysis will be a Environmental Sampling, Scientific Analysis and Scientific Dating

Health & safety associated with human remains

Micro-organisms that might cause harm to humans are extremely unlikely to survive beyond about 100 Years.

More recent remains could be more hazardous to health as they may be in sealed lead coffins.

The possible risks of contracting disease from excavated human remains are highly negligible but could include the virus smallpox, tetanus and anthrax spores, the bacterial infection leptospirosis and the fungal disease mycoses (a problem in dry dusty soils and in crypts).

Excavators should be up-to-date with tetanus inoculations.

Anthrax can come from materials derived from animals – coffin pads, pillows or coffin packing.

Working with human remains may cause psychological stress (see J. Thompson, 1998, Bodies, minds and human remains, in M. Cox (ed) 1998, Grave concerns: Death and Burial in England 1700-1850, pp 197-201).

There is a danger of lead poisoning arising from high levels of lead in the atmosphere generated by lead coffins (see H. Needleman, 2004, Lead poisoning in Annual Review of Medicine, 55, pp. 209-22).

Normal hygiene measures should be undertaken – washing hands, wearing masks and gloves. Heavily soiled clothing should be burned at an HSE approved site.

Further guidance is available in:

"Guidance for best practice for treatment of human remains excavated from

Christian burial grounds in England", The Church of England and English Heritage, 2005 (www.english-heritage.org.uk/upload/pdf/16602_HumanRemains1.pdf)

"Church Archaeology: its care and management", Council for the Care of Churches, 1999

Charlotte A. Roberts, 2009, 'Human Remains in archaeology: a handbook', CBA Practical Handbooks in Archaeology No. 19

The Advisory Panel on the Archaeology of Christian burials in England can provide free well-informed advice with consideration of relevant religious, ethical, legal, archaeological and scientific issues. Panel's website:

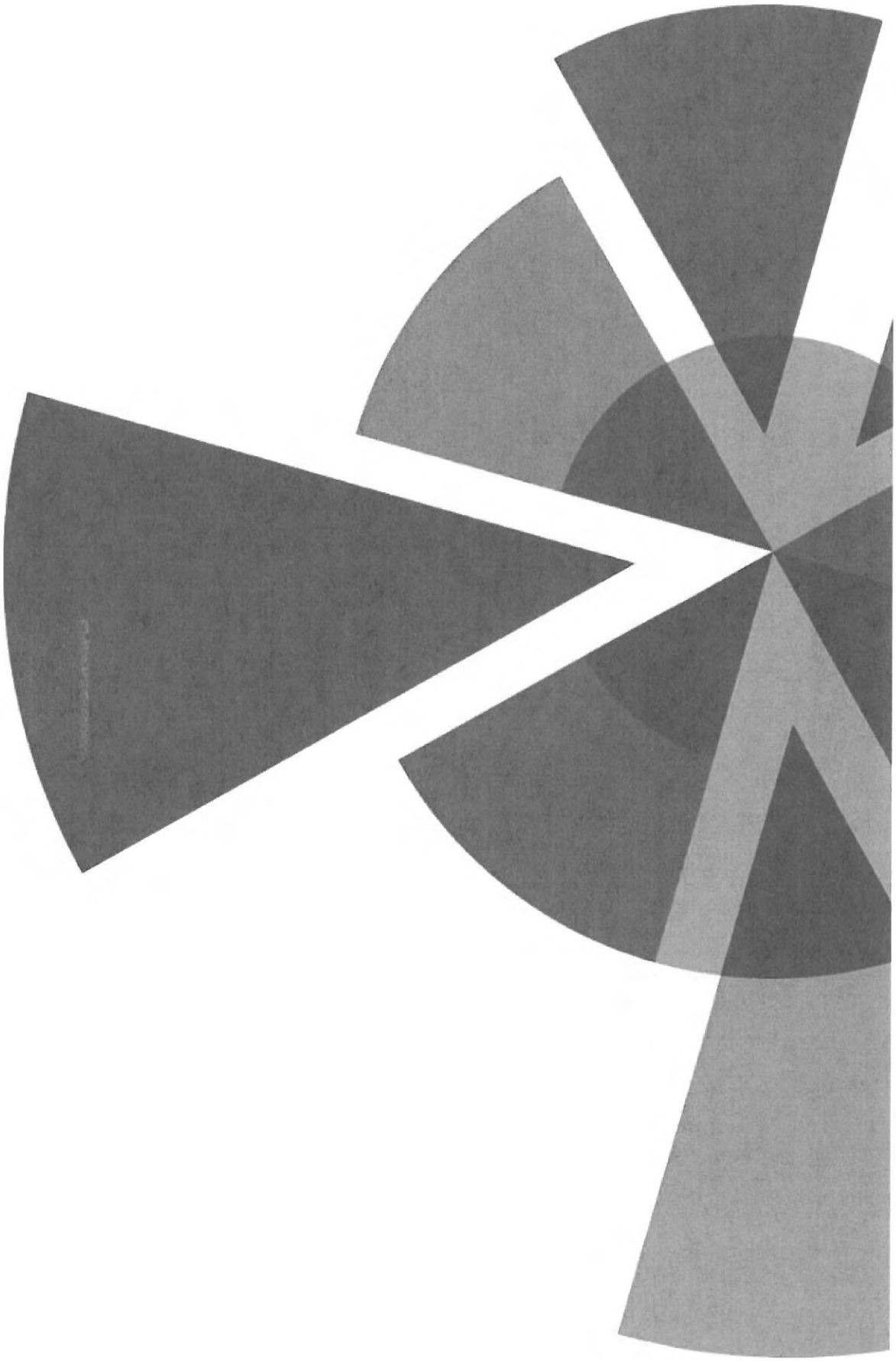
http://www.britarch.ac.uk/churches/humanremains/index.html or email the secretary simon.mays@english-heritage.org.uk

Treasure

Defined as:

- Any metallic object, other than a coin, provided that at least 10% by weight of metal is precious metal and that is at least 300 years old when found
- Any group of two or more metallic objects of any composition of prehistoric date that come from the same find
- All coins from the same find provided that they are at least 300 years old when found, but if the coins contain less than 10% gold or silver there must be at least ten
- Any object, whatever it is made of, that is found in the same place as, or had previously been together with, another object that is Treasure
- Any object that would previously have been treasure trove, but does not fall within the specific categories given above. Only objects that are less than 300 years old, that are made substantially of gold or silver, that have been deliberately hidden with the intention of recovery and whose owners or heirs are unknown will come into this category

If anything is found which could be Treasure, under the Treasure Act 1996, it is a legal requirement to report it to the local coroner within 14 days of discovery. The Archaeological Contractor must comply with the procedures set out in The Treasure Act 1996. Any treasure must be reported to the coroner and to The Portable Antiquities Scheme Finds Liaison Officer, Rob Collins (0191 2225076 or Robert.Collins@newcastle.ac.uk) who can provide guidance on the Treasure Act procedures.



March 2015
Doc Ref. 33921

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