

**AN ARCHAEOLOGICAL EVALUATION OF
THE FORMER SWAN HUNTER SITE,
STATION ROAD, WALLSEND,
NORTH TYNESIDE, TYNE AND WEAR**



PRE-CONSTRUCT ARCHAEOLOGY

DOCUMENT VERIFICATION

THE FORMER SWAN HUNTER SITE, STATION ROAD, WALLSEND, NORTH TYNESIDE, TYNE AND WEAR

EVALUATION REPORT

Pre-Construct Archaeology Limited Quality Control	
<i>Project Number</i>	K3181
<i>Site Code</i>	SHS 13
<i>Report Number</i>	RN11029

<i>Task</i>	<i>Name</i>	<i>Signature</i>	<i>Date</i>
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<i>Revision No.</i>	<i>Date</i>	<i>Checked by</i>	<i>Approved by</i>

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**An Archaeological Evaluation of the Former Swan Hunter Site, Station Road,
Wallsend, North Tyneside, Tyne and Wear**

Central National Grid Reference: NZ 430530 565910

Site Code: SHS 13

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October 2013
Addendum June 2014**

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1. NON-TECHNICAL SUMMARY

- 1.1 An archaeological evaluation was undertaken by Pre-Construct Archaeology at the former Swan Hunter shipyard and adjacent land (collectively 'the site') on the north bank of the River Tyne in Wallsend, North Tyneside, Tyne and Wear. The site is irregular in shape, in two parts covering a total of c. 20 ha, centred at National Grid Reference NZ 430530 565910. The main portion of the site, to the south, was formerly occupied by the shipyard but is now largely vacant since closure in 2007 and acquisition by the Local Planning Authority (LPA), North Tyneside Council.
- 1.2 The site was considered to lie within an area with particular potential for Roman period archaeological remains since its north-westernmost portion lies within the Buffer Zone of the Hadrian's Wall component of the transnational *Frontiers of the Roman Empire* World Heritage Site (WHS). The site lies immediately to the south-east of the Roman fort at Wallsend (*Segedunum*), a section of Hadrian's Wall (known as the 'Branch Wall') ran between the fort and the Tyne across the site, and the western portion of the site encompassed part of the extramural civilian settlement (*vicus*) which developed within the area between the fort and the river, to the west of the Branch Wall.
- 1.3 In addition to the potential for Roman remains, the site was considered highly likely to contain remains of elements of industrial era activity, most notably deposits and structures associated with the use of the site as a shipyard from the 19th century to the modern period, the development of which is depicted on historic mapping. Evidence of further industrial era activity was considered highly likely to be present in the northern portion of the site, probably associated with a railway which ran between Low Walker and Wallsend Colliery and whose line is fossilised in the landscape as Hadrian's Cycleway, the route of which divides the overall site into its smaller northern and larger southern parts.
- 1.4 The site was part of the first round of Enterprise Zones to be declared by UK Government in 2010. A Local Development Order (LDO) was created for the site in 2012 to fulfill the simplified planning system associated with Enterprise Zones. The LDO extended permitted development within the Enterprise Zone for a range of development types and included an approach to deal with archaeological remains via a suite of conditions, attached to the permitted development, requiring a phased approach to the archaeological potential of the site. However, despite the undoubted potential of the site for Roman period remains, the LDO was created without a clear understanding of the significance of any remains that might be present, with the result that potential developers could find the suite of archaeological conditions a deterrent and consider the process of evaluation and mitigation as having too many associated risks, because of unknown costs. As a result, the LPA and English Heritage agreed to fund and pilot an approach, whereby a first phase of archaeological evaluation of the site would explore the likelihood of nationally important archaeological remains being uncovered, with the principal aim of, hopefully, quantifying the degree of risk of developing presented by archaeological remains.

- 1.5 For this site, Capita Symonds acted on behalf of the LPA, in liaison with the Tyne and Wear Specialist Conservation Team and English Heritage, to develop and implement a suitable strategy for archaeological remains, initially involving the first phase of field evaluation. As well as aiming to clarify the location, depth, extent and significance of archaeological deposits within the site, in order to inform its future development, the work provided an opportunity to reflect on approaches to addressing archaeological issues within Enterprise Zones, through the compilation of a 'lessons learned' report, as part of the overall reporting phase of work for the evaluation.
- 1.6 The evaluation was undertaken according to a Brief compiled by Capita Symonds, which included a Specification prepared by the Tyne and Wear County Archaeologist. Ahead of the evaluation, and in liaison with the Inspector of Ancient Monuments (Hadrian's Wall) at English Heritage, the County Archaeologist also compiled a plan of the site, indicating archaeological sensitivity, specifically the potential for Roman archaeological remains (with potential graded 1-3, Grade 1 being the highest potential).
- 1.7 The site has been heavily developed since the mid 19th century, particularly during its use as the Swan Hunter shipyard. This has led to substantial changes in ground level with up to 10m of infilling recorded by geotechnical investigations. Therefore, the southernmost part of the site, a strip adjacent to the Tyne, was considered to have low (Grade 3) potential for Roman remains. The remainder of the site, lying to the north and occupied by the rear of the shipyard deck and terraced ground rising up to Buddle Street and the site of the Roman fort, was determined as having either medium (Grade 2) or high (Grade 1) potential for Roman remains. It was anticipated that post-medieval and modern material would overlie Roman levels, probably to substantial depths in some parts of the site.
- 1.8 Ten evaluation trenches were investigated (Trenches 1-4, 6-11), sited within areas of either medium or high potential for Roman remains. The investigation of a proposed Trench 5 was abandoned prior to work commencing due to Health and Safety considerations. Trenches 3, 8, 9, 10 and 11 were located within areas of moderate potential for Roman remains and Trenches 1, 2, 4, 6 and 7 were located within areas of high potential for Roman remains.
- 1.9 Trench 1 was sited towards the western end of the main portion of the site to ascertain the original position of the river edge, and the presence/absence of Roman riverside remains. Trench 2 was sited towards the north-western boundary of the main portion of the site on elevated ground above the Wet Dock and south of the Hadrian's Cycleway to test the presence/absence of Roman remains associated with the *vicus*. Trench 3 was sited towards the north-western boundary of the main portion of the site, on a terraced area south of the Hadrian's Cycleway, to test the presence/absence of archaeological remains in an area formerly occupied by modern buildings and on the probable line of a Roman road which ran south from the fort. Trench 4 was sited towards the north-western boundary of the main portion of the site, on a grassed slope between a concrete roadway and the north end of the Wet Dock, to ascertain the location of the original river edge and the presence/absence of Roman riverside remains. Trenches 6 and 7 were both sited in the northern central part of the main portion of the site, north of the Dry Dock, to ascertain the presence/absence of the Branch Wall, based on its presumed course.

- 1.10 Trench 8 was sited within a car park in the north-western part of the smaller northern portion of the site adjacent to Buddle Street, on the probable alignment of an eastern road from the fort. Trench 9 was sited towards the central northern boundary of the main portion of the site, on a terrace to the south of Hadrian's Cycleway, to ascertain the effect of modern terracing on the natural ground level and archaeological remains. Trench 10 was sited within the south-eastern part of the smaller northern portion of the site, north of the Hadrian's Cycleway, to test the presence/absence of Roman period remains. Trench 11 was sited within the northernmost part of the main portion of the site, to test the presence/absence of Roman period remains.
- 1.11 The evaluation established that the site appears to have very limited potential for prehistoric, medieval and early post-medieval archaeological remains. Deposits and structures of mid 19th-century and later date were recorded in all trenches, the majority associated with industrial activity. Such remains included a substantial depth of sand and gravel ballast recorded in Trenches 1 and 6 – this being material dumped to infill the area of the former foreshore - and various brick and concrete structures recorded in Trenches 1, 6 and 7. Remains derived from 19th- and early 20th-century railway infrastructure were recorded in the northern extent of the main portion of the site (Trenches 2, 3 and 11) and in the smaller northern portion of the site (Trenches 8 and 10).
- 1.12 The earliest deposit recorded in Trench 6 comprised a probable foreshore deposit, exposed in a machine-excavated slot in the base of the trench. A bulk sample of the deposit demonstrated that significant palaeoenvironmental remains – possibly of late medieval or post-medieval origin - are well preserved in this part of the site, located on the shipyard deck, which would have been within the foreshore prior to industrialisation and land reclamation associated with canalisation of the river.
- 1.13 Roman deposits and features were recorded in Trenches 2, 3, 4 and 8. Stratified deposits were recorded in Trenches 3 and 4, with the uppermost at relatively shallow depths below the existing ground level. In Trench 3, the earliest deposit of possible Roman date was a probable sandstone surface. Although no datable material was recovered, an overlying developed soil yielded a single sherd of Roman pottery. In Trench 4, a significant depth of stratified Roman deposits was recorded at the north-west end of the trench. Deposits with a maximum combined thickness of 2.20m were revealed in section, although these had been almost immediately truncated to the south-west by the cutting for the Wet Dock. The earliest features included two NE-SW aligned ditches and associated re-cuts, possibly representing a second-century AD boundary for the *vicus*. One ditch fill contained significant palaeoenvironmental remains preserved by the waterlogged conditions. The north-westernmost ditch was overlain by a levelling deposit for a stone surface and the recovered pottery suggests that, by the third century AD, occupation in the *vicus* had extended to this area and the boundary had been moved to the south-east, as represented by a defensive bank and ditch identified during earlier investigations at the site. The surface was overlain by a substantial thickness of refuse deposits, presumably deposited when occupation in the *vicus* had contracted or ceased. Small assemblages of Roman pottery and bone were recovered from the majority of these deposits, although the relatively large quantity of unstratified material recovered demonstrated that Roman period deposits in this part of the site contain significant artefactual and ecofactual assemblages.

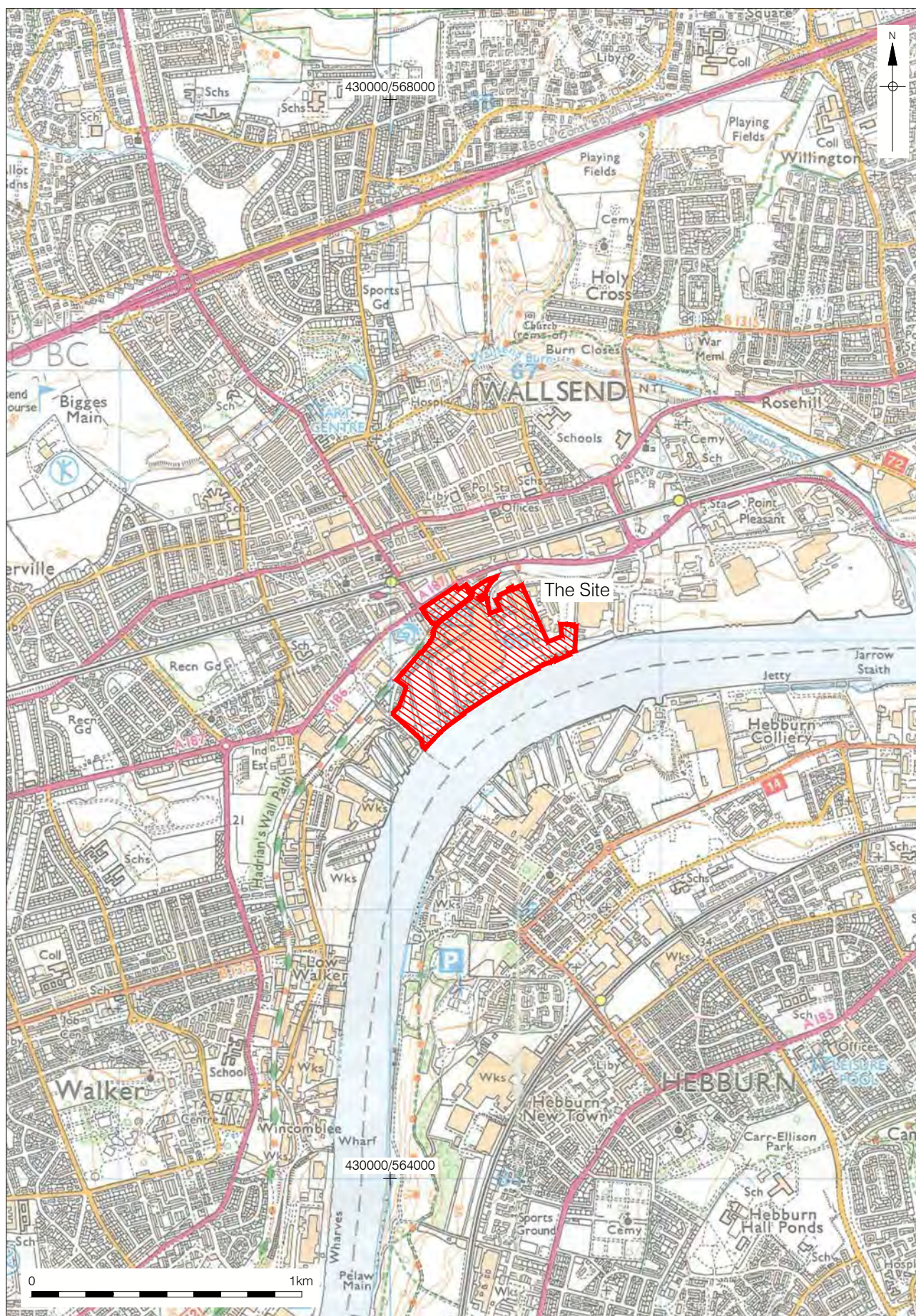
- 1.14 Roman period remains recorded in Trenches 2 and 8 comprised horizontally-truncated features cutting into the natural clay sub-stratum. In Trench 2, intercutting features including a probable 'robbed out' wall, from which ceramic building material and Roman pottery were recovered, and a possible pit. Both features were encountered at a depth of c. 2.20m below existing ground level. In Trench 8, a substantial, probably east-west aligned, ditch 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.
- 1.15 In sum, the evaluation established that despite later post-medieval industrial and modern era activity having had a significant adverse impact upon strata from earlier archaeological eras in the majority of the trenches investigated, archaeological remains of the Roman period do survive at the site, and while of undoubted importance, none of the recorded remains appear to be of national importance. The results of the evaluation have allowed the archaeological sensitivity plan, indicating the potential for Roman remains, to be revised.
- 1.16 In terms of informing future development of the site, the process implemented achieved its objective of reducing uncertainty regarding the risks associated with re-development and was also able, up to a point, to quantify the risk of further archaeological work. The evaluation achieved this by suggesting that most deposits were either too badly truncated to merit preservation, could be preserved *in situ* through foundation design or could simply be the subject of archaeological monitoring during the construction phase of re-development, all required by the suite of archaeological conditions on the LDO.
- 1.17 The overarching lesson learnt as a result of the work is that the adopted approach was successful and clearly has some applicability to other Enterprise Zones. The importance of having a 'baseline' statement of archaeological potential in place at an early stage - and ideally before the decision is made to bid for Enterprise Zone status – has been clearly highlighted by the work. For sites which have not already had historic environment/archaeological desk-based assessments or heritage statements undertaken (informed where possible by geotechnical data), it is recommended that consideration should be given to undertaking such work, which is generally highly informative and will greatly reduce the risk of any sites being promoted for development which might contain nationally important archaeological remains. Pre-determination archaeological evaluation is also important because it helps to determine whether nationally important archaeological remains might constrain development and it is only good planning practice to ensure that this happens before there is an investment in time and money by LPA staff or developers.

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 (PCA) July-August 2013 at the former Swan Hunter shipyard and adjacent land ('the site') in Wallsend, North Tyneside, Tyne and Wear (Figure 1). The evaluation was commissioned by Capita Symonds, on behalf of the site owner, this being the Local Planning Authority (LPA), North Tyneside Council, with English Heritage assisting with the funding of the archaeological work.
- 2.1.2 The site is irregular in shape and has two parts, divided by the Hadrian's Cycleway, with an overall size of c. 20 ha (Figure 2). Its main portion lies to the south, this formerly occupied by the shipyard but now largely vacant, while its smaller portion lies to the north, bounded to the north by Buddle Street. In broad terms, the site is on two distinct levels, with the former shipyard deck at much lower level than the northern parts of the site.
- 2.1.3 The archaeological potential for the site is primarily for the Roman period, since it lies immediately to the south and east of the Roman fort at Wallsend (*Segedunum*), the easternmost section of Hadrian's Wall (known as the 'Branch Wall') ran across the site between the fort and the Tyne, and the western portion of the site encompasses part of the area of the extramural civilian settlement (*vicus*) which developed between the fort and the river, to west of the Branch Wall (Hodgson 2003, 10; Figure 2). The majority of the area of the Roman fort is a scheduled monument, while the site itself partly lies within the Buffer Zone of the Hadrian's Wall component of the transnational *Frontiers of the Roman Empire* World Heritage Site (WHS), which includes the Antonine Wall in Scotland and the German Limes (information from the *MAGIC* and *UNESCO/World Heritage Convention* websites). The site is, therefore, associated with archaeological remains of national and international importance.
- 2.1.4 In addition to its Roman potential, the site was considered highly likely to contain archaeological remains of industrial era activity, most notably derived from its use as a shipyard from the 19th century to the modern period. Further industrial era activity was considered likely in the northern portion of the site, which was crossed by a railway running between Low Walker and Wallsend Colliery and whose line is fossilised in the landscape as the Hadrian's Cycleway.
- 2.1.5 The majority of the former Swan Hunter site has been designated as an Enterprise Zone. In order to bring greater certainty to prospective developers, the designation extends permitted development within the Zone using a Local Development Order (LDO). In this instance, because of its location, the LDO has been designed specifically to deal appropriately with the potential for archaeological remains of the Roman period. As part of the LDO, a condition has been attached to the permitted development requiring a phased approach to addressing the archaeological potential of the site. The first element of this approach is the archaeological evaluation herein described. While the overarching aim of the work is to gain a better understanding of archaeological remains at the site, a specific objective is to explore the likelihood of remains of national importance being present.

- 2.1.6 The Brief for the evaluation (North Tyneside Council and Capita Symonds 2013) included a Specification prepared by the Tyne and Wear County Archaeologist (Tyne and Wear Specialist Conservation Team 2013). The document is included as Appendix 6 to this report.
- 2.1.7 The site has been the subject of several previous archaeological interventions and other work. An archaeological desk-based assessment undertaken in 1998, ahead of a proposed re-development scheme for the western portion of the former shipyard, highlighted the potential for Roman archaeological remains surviving below the shipyard deck, where ground levels have been raised across the area of the former foreshore prior to 19th-century development (TWM 1998 and 1999). A geotechnical desk-based assessment and follow-up site investigation were undertaken as part of the same proposal (Entec 1999 and 2000) and other geotechnical work has been undertaken (*e.g.* White Young Green Environmental 2008).
- 2.1.8 The Tyne and Wear Historic Environment Record (HER) reports that, in 2002, an archaeological excavation was undertaken at the north-western boundary of the main portion of the site (within the vicinity of Trench 4 in the current investigation), in advance of the construction of a proposed new Dry Dock. This work demonstrated the survival of significant Roman remains and recorded a sequence of roughly NE-SW aligned banks and ditches, c. 75m south of the fort and running parallel to the Roman foreshore. The features have been interpreted as forming elements of a defensive cordon that potentially delimits the *vicus* to the south of the fort (Burnham 2002, referenced in HER entry 806 on the *Sitelines* website).
- 2.1.9 An archaeological appraisal of the site, incorporating the results of archaeological monitoring of further geotechnical investigations, was undertaken in 2007 (Speed 2007). This further highlighted the potential for remains of Roman date within the western portion of the site associated with the Branch Wall, the fort *vicus* and the contemporary foreshore and recommended archaeological evaluation to determine the presence/absence of such remains.
- 2.1.10 Ahead of the archaeological evaluation, the Tyne and Wear County Archaeologist, in liaison with the Inspector of Ancient Monuments (Hadrian's Wall) at English Heritage, designed an archaeological sensitivity plan showing the potential for Roman remains across the site, with potential graded from 1-3 (Grade 1 being the highest) (Figure 3). An objective of the evaluation was to use the results of the work to revise this plan. A programme of geotechnical investigations was undertaken ahead of and in conjunction with the evaluation within areas of medium to low (Grades 2 and 3) potential for Roman remains; the results of this work were not available at the time of writing.
- 2.1.11 The evaluation comprised ten machine-excavated archaeological trial trenches (Figure 2). These were located across the site within areas deemed to be of either medium (Grade 2) or high (Grade 1) potential for Roman remains. These were sited either as 'judgment' trenches, to assess the presence/absence of archaeological remains, or to target specific locations with high potential for Roman archaeological remains. The work was carried out in accordance with standards and guidance set out by the Institute for Archaeologists (IfA 2008a).

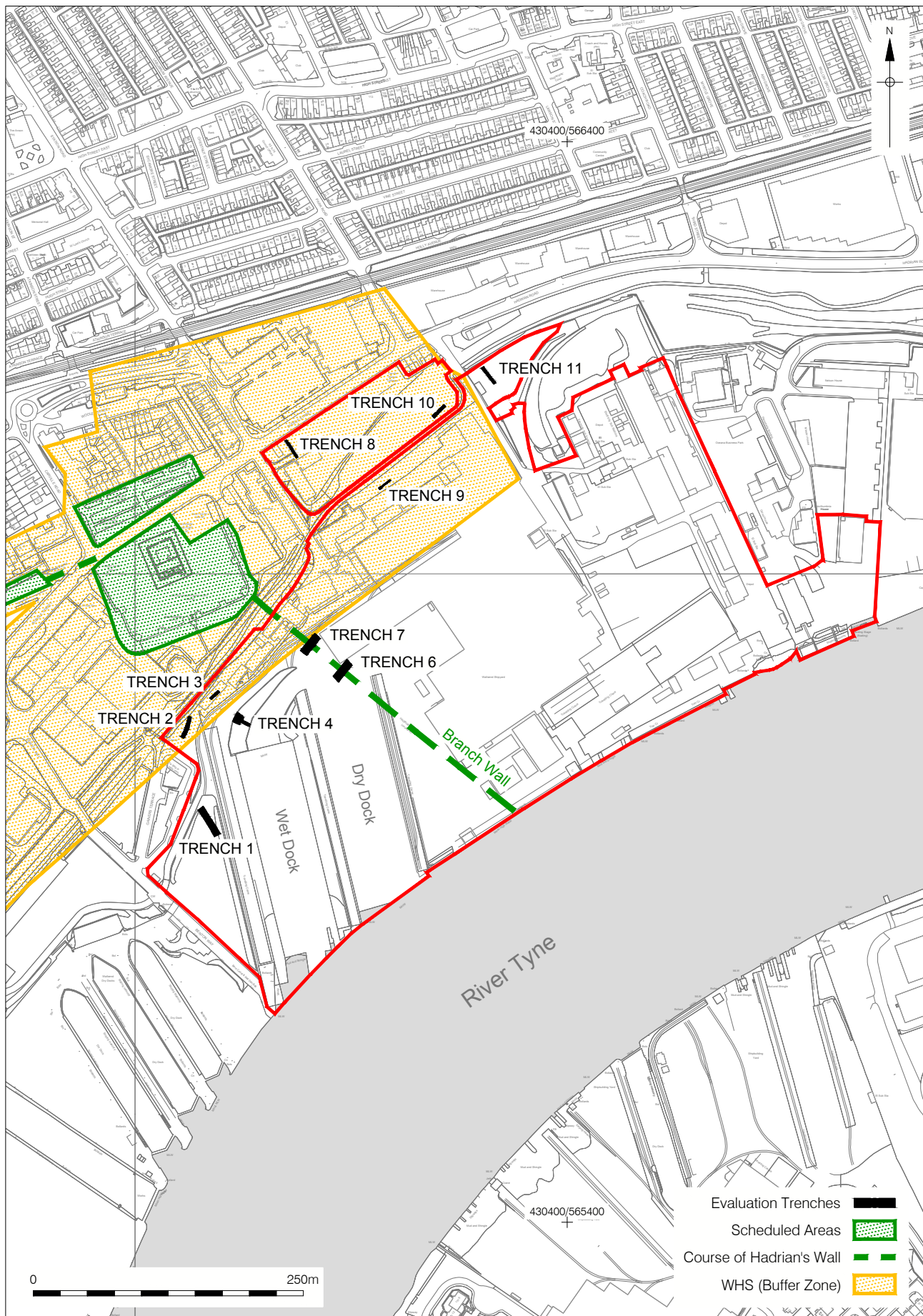


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Figure 1
Site Location
1:20,000 at A4



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Figure 2
Detailed Site and Trench Location
1:5,000 at A4

- 2.1.12 The Brief required, in addition to a report detailing the evaluation results, compilation of a report designed to reflect on 'lessons learned'¹ on the issue of archaeological remains in Enterprise Zones, together with recommendations for how archaeological issues could be approached in these areas in order to enable sustainable growth and maintain standards of conservation. The lessons learned report, compiled by Caroline Hardie of Archaeo-Environment Limited on behalf of PCA, has been integrated into this report.
- 2.1.13 The Site Archive (site code SHS13) is currently held at the Northern Office of PCA and the retained element, comprising the written, drawn and photographic records, as well as the assemblages of artefactual and faunal material and any retained palaeoenvironmental material, will ultimately be deposited with the Tyne and Wear Museums and Archives at Arbeia, South Shields, Tyne and Wear. The Online Access to the Index of Archaeological Investigations (OASIS) reference number for the project is: preconst1-160183.

2.2 Site Location and Description

- 2.2.1 The site is located on the north bank of the River Tyne and comprises the former Swan Hunter shipyard and adjacent land off Station Road, Wallsend, North Tyneside, Tyne and Wear. Centred at National Grid Reference NZ 430530 565910, the site has an irregular shape, formed by two distinct areas, a larger southern portion and a smaller northern portion, these separated by the Hadrian's Cycleway (Figures 1 and 2). Overall, the site covers c. 20.4 ha. To the west, the Hadrian's Cycleway follows the route of a former railway line, while, to the east, the portion which separates the two parts of the site diverts from the line of the railway (which continues to the north-east, effectively bisecting the northern portion of the site, although its presence is largely obscured).
- 2.2.2 The main, southern portion of the site is bounded: to the south by the River Tyne; to the north for the most part by the Hadrian's Cycleway and also (to the west) by the area formerly occupied by the Ship Inn; to the west by Benton Way and; to the east by Oceana Business Park premises and also (to the north) by an area of waste ground. The smaller, northern portion of the site is bounded: to the south by the Hadrian's Cycleway; to the north by Buddle Street; to the east by the 'Carville Gate' access road and; to the west by Station Road, this the main access to the site.
- 2.2.3 In broad terms, the site occupies two distinct levels. To the south, its lower-lying larger portion is mostly occupied by the concrete hardstanding of the former shipyard deck, with an area of waste ground to the extreme west and the Carville Works forming the majority of the easternmost part of this portion of the site. The surviving former office and administration buildings of the shipyard occupy an upper terrace crossing the northern part of the main portion of the site, skirted to the north by the Hadrian's Cycleway. From this elevated terrace, delimited for the most part by a shuttered retaining 'wall', there is a significant drop of several metres down to the shipyard deck or, to the east, buildings overlooking the deck.

¹ The phrase 'lessons learned' originated with PRINCE2 (PRojects IN Controlled Environments), a widely used project management method used extensively by the UK Government (information from the *PRINCE2* website).

- 2.2.4 The eastern part of the shipyard deck extends south to the existing quay wall, while, to the west, the deck incorporates the surviving Wet and Dry Docks (Figure 2). Former construction sheds and other structures on the eastern part of the deck have been demolished in recent years. The northern portion of the site, lying between Buddle Street and the Hadrian's Cycleway, comprises a roughly level area of land occupied, to the west, by the Segedunum Business Centre and, to the east, by waste ground.
- 2.2.5 Previous geotechnical investigations have established that there is a substantial difference in the depth of 'made ground' across the overall site from south to north. Along the line of the quay wall, a depth of c. 10m of material lies above natural geological material. Below the shipyard deck, the depth of material generally decreases to the north, while a depth of only c. 1m of made ground is present across the terraced northern part of the site.

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 Devensian Till (boulder clay) overlain by alluvial soils of the River Tyne (information from the *British Geological Survey* website).
- 2.3.2 As mentioned, the main portion of the site is on two distinct levels created by land reclamation and landscaping activity undertaken from the mid-19th century onwards. To the south, the former shipyard deck slopes upwards imperceptibly from south to north; ground level at Trench 6 was recorded at a height of c. 7.05m OD and at Trench 7 it was recorded at c. 7.75m OD. Trench 4 was sited along the northern edge of the cutting for the Wet Dock and at its north-western end, adjacent to an access road, ground level was recorded at a maximum height of c. 9.30m OD, falling sharply to the south-east.
- 2.3.3 Trench 1 was sited on waste ground immediately to the west of the Wet Dock; ground level was recorded at a maximum height of c. 8.70m OD. To the north of the shipyard deck, immediately behind the retaining wall, ground level was recorded (to the west, Trench 2) at a height of c. 15.05m OD and (centrally, Trench 9) at c. 17.40m OD. The smaller northern portion of the site occupies higher ground north of the Hadrian's Cycleway, further up the valley side of the Tyne. Ground level in the western part of this area was recorded at a maximum of c. 22.90m OD (Trench 8), falling away to the east, beyond the line of the former railway, to a height of c. 19.70m OD (Trench 10). To the north-east, in the northernmost part of the main portion of the site, ground level was recorded at a maximum height of c. 19.65m (Trench 11).

2.4 Planning Context

- 2.4.1 The former Swan Hunter site in North Tyneside was part of the first round of Enterprise Zones to be declared by the UK Government in 2010. There are currently 24 Enterprise Zones in England (and four Enterprise Areas in Scotland and seven Enterprise Zones in Wales), and each zone can include a number of disparate sites within a region. The North Eastern Enterprise Zone covers 115 ha, including ten sites in three clusters, of which the former Swan Hunter site is one (information from the *Enterprise Zones* website). The majority of the site investigated by the archaeological evaluation herein described lies within the Enterprise Zone.

- 2.4.2 Enterprise Zones have been created to aid regeneration and development in the current economic context, with provision for financial assistance and through the implementation of a simplified spatial planning process. The initiative is intended to support and attract investment in key sectors which have been identified as having potential for growth. As well as aiding regeneration, the initiative aims to provide information which can reduce risk and bring greater certainty to potential developers. Enterprise Zones attract business rates relief and a business-ready infrastructure, but from the archaeological point of view, the most important element is the simplified planning process and the consequences this has for any heritage interest within an Enterprise Zone.
- 2.4.3 In order to bring greater certainty to developers, permitted development within the Enterprise Zone is extended for a range of development types and this is achieved through the use of LDOs.² This means that, for specific developments that help deliver the aims of the Enterprise Zone, planning permission will not be required as the principle of development is accepted. For the former Swan Hunter site, the LPA has developed an LDO which, in addition to awarding deemed consent, has also been used to deal with the potential on the site for Roman archaeological remains associated with the Hadrian's Wall frontier – as mentioned, the smaller northern portion of the site and the northern margin of the main portion of the site lie within the Buffer Zone of the Hadrian's Wall component of the transnational *Frontiers of the Roman Empire* WHS (Figure 1). Although the formal WHS status does not extend into the site, archaeological remains of the Roman period within the portion covered by the WHS Buffer Zone (and indeed the remainder of the site) 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).³

² LDOs are an established part of the planning system having been introduced through the Town and Country Planning Act 1990. Their roles and functions have been revised through subsequent legislation as follows: Sections 61A-D and Schedule 4A to the Town and Country Planning Act amended; Planning and Compulsory Purchase Act 2004; Section 188 of the Planning Act 2008; and the Town and Country Planning (Development Management Procedure) (England) Order 2010. LDOs can be a mechanism through which minor development in defined areas can be managed more effectively through an impacts-based approach. They can provide a way to reduce 'unnecessary' planning applications being submitted to local authorities and so benefit customers and service delivery. LDOs can be revoked at any time.

³ The NPPF came into effect in March 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.

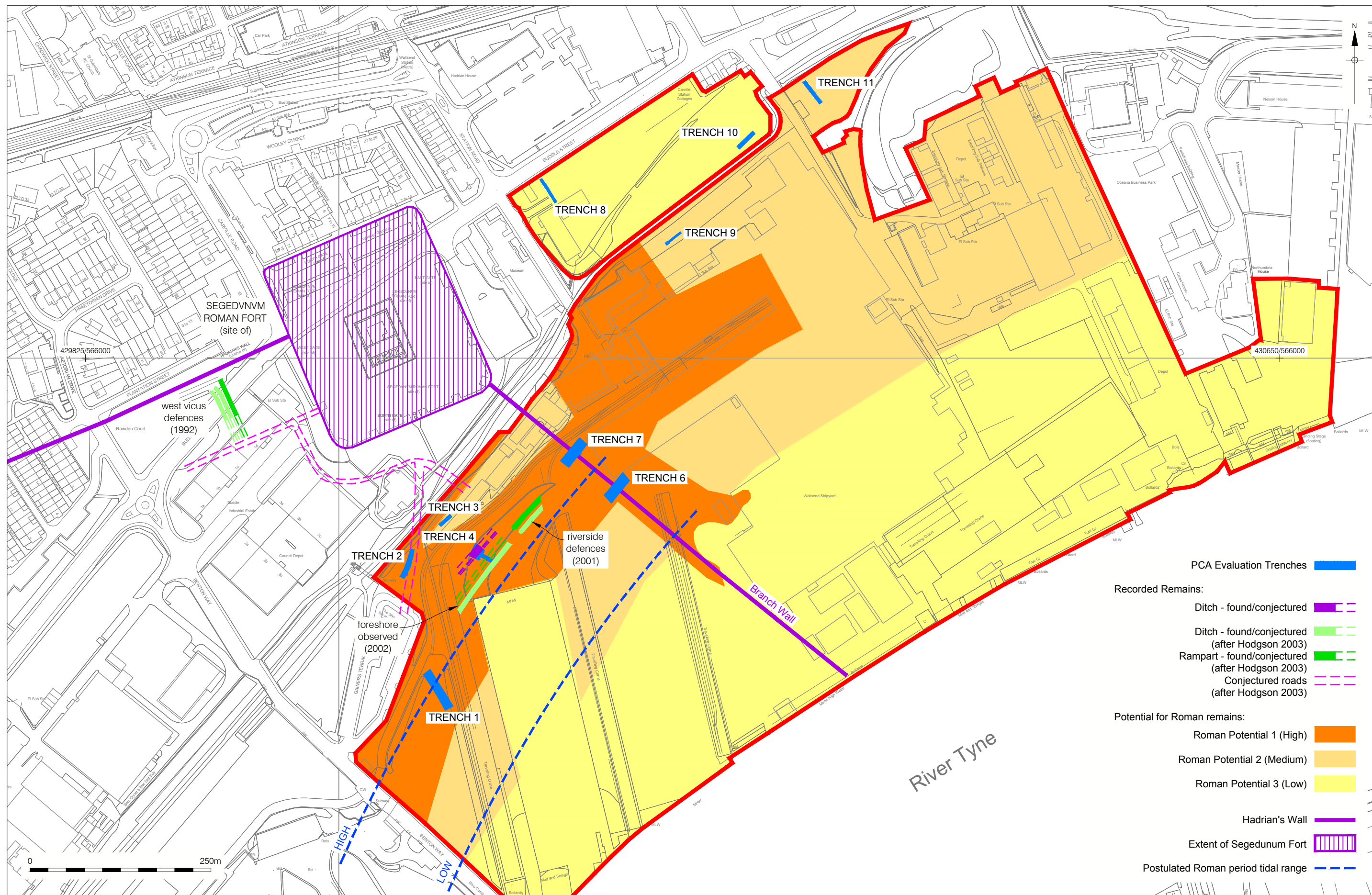


Figure 3
 Initial Archaeological Sensitivity (Roman Remains) Plan
 (showing Roman remains recorded during previous investigations)
 1:2,500 at A3

- 2.4.4 As mentioned above, an archaeological desk-based assessment (Tyne and Wear Museums 1998) and subsequent appraisal (Speed 2007) had already been commissioned for the Swan Hunter site by previous prospective developers and it was clear, therefore, even before the site was declared an Enterprise Zone, that there was considerable archaeological potential, although its significance was far from being clearly understood. As a result, trial trenching had already been recommended by archaeological contractors and the County Archaeologist. Specialist in-house knowledge therefore made it possible for the County Archaeologist, in liaison with the Inspector of Ancient Monuments (Hadrian's Wall) at English Heritage, to design the aforementioned archaeological sensitivity plan marking the potential for Roman remains across the site (Figure 3). It was immediately obvious that for approximately half the site any buried deposits relating to Roman occupation would already have been destroyed by industrial development from the late 18th century onwards and that such areas could be developed with only limited archaeological work designed to record industrial era remains. However, for the north-western part of the site there was greater potential and, accordingly, some concern that archaeological remains there threatened by development proposals would require excavation if of local or regional significance or merit preservation *in situ* if of national significance. The LPA elected to defer any evaluation of the site to a later stage and included a requirement for a phased programme of archaeological work, which included evaluation, which would be conditioned as part of the LDO.
- 2.4.5 The conditions imposed on the LDO for the Swan Hunter site were a result of consultation between the LPA and English Heritage and sought to set out a pathway to protect significant archaeological remains and record less significant archaeological remains, while not deterring future development of the site:

Condition 6 - Archaeological Evaluation and Mitigation

Prior to the commencement of any groundworks or development, a programme of archaeological evaluation works shall be completed in accordance with a specification provided by the Local Planning Authority. The work shall be undertaken by a suitably qualified archaeologist who will supervise those works on site.

The programme shall set out those measures to be undertaken if during any excavation or development works any archaeological assets are identified, including notification of the Local Planning Authority and English Heritage, and measures for the interim protection of those archaeological assets.

Following the preliminary archaeological evaluation set out above, one of the following mitigation measures shall be undertaken fully and only in accordance with a detailed scheme that must be submitted to and agreed in writing with the Local Planning Authority.

A. If nationally important heritage assets are found, the developer shall submit a scheme for the necessary protection of those assets, detailing the design of any piling or foundations and including a timetable for the implementation of the protection measures. Thereafter the works on site shall be undertaken only in accordance with the programme previously agreed in writing by the Local Planning Authority.

B. If heritage assets of less than national importance are found, the developer shall submit to, and agree in writing with the Local Planning Authority, a detailed programme. This programme will identify a written scheme of Investigation drawn-up by the developer for the prior archaeological excavation and recording of those assets and detailing the design of any pilings or foundations of any development. Thereafter the archaeological investigation and the construction details for the development shall be undertaken only in accordance with the approved programme.

C. If heritage assets of local importance are encountered then the following measures shall be taken; prior to further works being undertaken, the developer shall submit to, and agree in writing with the Local Planning Authority, a detailed scheme of Investigation of those assets by means of a Watching Brief or further excavation/investigation. The watching brief and written scheme of investigation shall be undertaken in full and only in accordance with the agreed scheme.

Condition 7 - Archaeological Post Excavation Report

Following the undertaking of the archaeological investigations as set out in condition 6 which are to be undertaken to the satisfaction of the Local Planning Authority in consultation English Heritage, the building(s) structures hereby allowed shall not be occupied/brought into use until the final report of the results of all phases of the archaeological fieldwork has been submitted to and approved in writing by the Local Planning Authority.

Condition 8 - Archaeological Publication Report

Within six months of the occupation of the hereby allowed, a report at the expense of the developer, detailing the results of the archaeological fieldwork undertaken shall be submitted to and approved in writing by the Local Planning Authority. The report shall be produced in a form suitable for publication in an appropriate and agreed journal, prior to submission to the editor of the journal.

Reason

In order to ensure that developers submit sufficient information to enable the authority to properly assess the archaeological interest of the site, to conserve any heritage assets identified in a manner appropriate to their significance, and to comply with PPS5 Planning for the Historic Environment.⁴

- 2.4.6 Potential developers were then required to submit details of their approach, including the details of their archaeologist and confirmation that they will be present on site at all necessary times.

⁴ Now replaced by the NPPF.

- 2.4.7 The first phase of archaeological evaluation, as herein described, was commissioned and funded by the LPA and English Heritage, to be followed by further evaluation and mitigation where necessary and funded by future developers. The first phase was designed to allow better understanding of Roman archaeological remains on the site so that a judgement could be made as to whether the significance of those remains merited preservation *in situ* or, where such preservation was not considered appropriate, what archaeological mitigation fieldwork would be reasonable and justified. However, because an LDO had been issued, planning permission could not be withdrawn, even if archaeological remains at the site were considered to be of national importance as a result of the evaluation work. Figure 4 illustrates the archaeological process for the Swan Hunter Enterprise Zone.
- 2.4.8 The process in this instance therefore largely mirrors that of a standard planning application with the need for archaeological information in advance of development proposals so that significance and impact can be understood and mitigation devised, but the timing and funding were critically different and the right to refuse planning permission withdrawn; planning permission is not required, providing that the conditions imposed on the creation of the LDO are adhered to. It is worthy of note, however, that the LDO conditions as drafted do afford the LPA an opportunity to deny the ability to develop in the event that nationally important archaeological remains are encountered; for example, under Item A of Condition 6, the LPA could refuse to approve a scheme proposed for the protection of such remains, *e.g.* a foundation design. In this way, the LPA can in effect provide maximum protection for nationally important remains whilst, in overall terms, be seen to be embracing the LDO approach.
- 2.4.9 As mentioned, at this site the first phase of archaeological evaluation targeting Roman archaeological remains was not paid for by prospective developers, but by the LPA and English Heritage. To this end, the County Archaeologist issued the aforementioned Specification for the evaluation in consultation with English Heritage, and the LPA put the work 'out to tender', working with Capita Symonds to appoint a contractor to carry out the work, overseen by the County Archaeologist, who also responded to queries during the tender process. This process can also be mirrored in a normal planning application process, but it is more common (outside Tyne and Wear) for the LPA archaeologist to prepare a simple Brief for the works and then for a contractor appointed by the developer to produce a Specification (or Written Scheme of Investigation or Project Design) for approval; normally the LPA charge for this approval.
- 2.4.10 The provision of geotechnical data through boreholing and test pitting was funded by the LPA and an archaeological contractor appointed to observe the works. As mentioned, geotechnical site investigations had already been carried out at the site (*e.g.* Entec 2000 and work in 2007 summarised in Speed 2007, 3). The current phase of geotechnical work, including extensive boreholing, complemented the archaeological trial trenching by targeting those areas not being sampled through archaeological evaluation in order to create a wider spread of knowledge on ground conditions.
- 2.4.11 Such information also has the additional benefit for developers of providing further geotechnical detail to assist with designing foundations thereby saving them additional resources. Again, the requirement for archaeological observation of geotechnical investigations is not unusual, but in this instance, the data was obtained by the LPA, thus removing the expense and delay for the developer to acquire it.

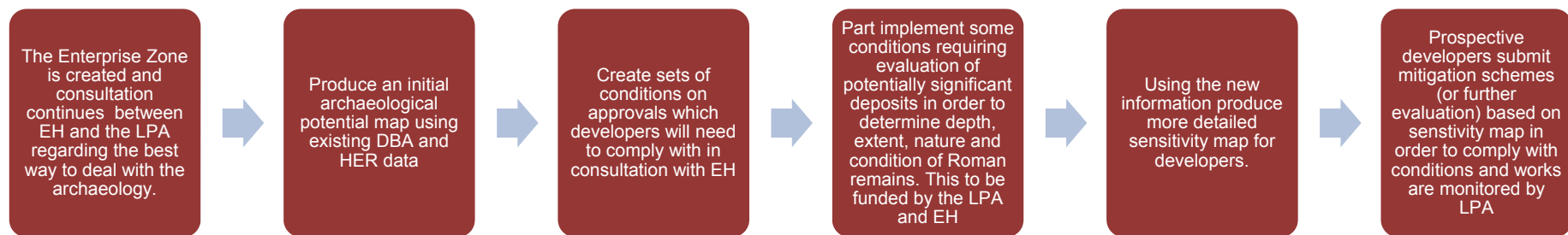


Figure 4. Simplified process chart showing how archaeological evaluation and mitigation is carried out in the Swan Hunter Enterprise Zone

- 2.4.12 In this case, geotechnical investigations were carried out before and after the archaeological trial trenching, although it is generally more usual for such work to be carried out in advance of trial trenching as the results can provide valuable information regarding the siting of trenches. However, the decision to only drill boreholes in areas not being evaluated meant that this timing was not critical.

2.5 Archaeological and Historical Background

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 extensive 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 Excavations in 1993 to the north-east of the fort did not find any trace of pre-Roman agriculture, but a fragment of Bronze Age or Iron Age pottery recovered from a Roman gully provides further evidence for prehistoric activity in the area (Griffiths 1993, 26).
- 2.5.4 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

- 2.5.5 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.

- 2.5.6 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). Its southern end must therefore have been a type of mole and one antiquarian account (Skinner and Wallis) states that this part of the wall was built of very large squared stones (*ibid*). It has been postulated that the terminal of Hadrian's Wall would have been marked by a monument and these may well have formed the base of such a structure (Bidwell 2009, 72; Hodgson 2009, 71). The foundation of the wall in the river is recorded as having been dismantled in 1800 as it was obstructing vessels associated with the growing numbers of collieries along the Tyne (Speed 2007, 2).
- 2.5.7 The Branch Wall was observed in several locations between 1884 and 1997 and its line, as observed in 1903 within the Swan Hunter site is marked with a panel of re-used Wall stones and a plaque (Speed 2007, 2). Part of the Wall footings are exposed on the south side of the Hadrian Cycleway, running up the slope from the current site boundary towards the fort and a substantial section of Wall up to six courses high has been rebuilt at the top of the slope using material recovered from the area developed as the 'Engineering Office' in 1903.
- 2.5.8 In 2000, part of the Branch Wall close to the south-east corner of the fort was exposed for a distance of 12m and consolidated for permanent display. It was built on 1.70–1.80m wide foundations (the same width as the foundations of the fort wall) indicating that it was built as an extension to the fort and not to the same specification as Hadrian's Wall (Bidwell 2009, 72–73). At the southern end of the exposed length, the foundation comprised a clay and rubble raft which supported a mortared wall 3.10m wide. Mortared stones survived above the east side of the foundations, but these were tilted forward indicating that the wall had collapsed.
- 2.5.9 The Branch Wall was fronted to the north-east by a large defensive ditch which continued as the main inner ditch around the eastern and northern sides of the fort. The only recorded evidence for this ditch fronting the Branch Wall was a segment adjacent to the fort excavated in 1929. In this area the ditch was 6.40m wide with a 7m wide berm between ditch and Wall. It is generally presumed that the ditch continued downslope to the shoreline (Hodgson 2003, 19).
- 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 18th century. In the first half of the 19th 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. This road may have led to the baths which antiquarian reports suggest was located 140m south of the south-west angle 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).
- 2.5.15 Activity has also 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.

Post-medieval and Post-medieval Industrial

- 2.5.16 Practically nothing is known about this part of North Tyneside from the period between the end of Roman occupation and the 18th century. The earliest surviving maps demonstrate that by the 18th century the riverside was occupied by open fields.

- 2.5.17 Wallsend Colliery was established in the late 18th 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 of the Ordnance Survey map in 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 18th 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 site.

Early Modern Industrial and Modern

- 2.5.18 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 now occupied by the former Swan Hunter site. Groyning works in the early 19th century moved the channel southwards and much of the area developed as the existing shipyard was reclaimed from the tidal mud flats created by the shifting of the channel.
- 2.5.19 Wallsend Chemical Works were established in the area now occupied by the north-central part of the Swan Hunter yard in the mid 19th century (Figure 12).
- 2.5.20 Coulson, Cooke and Co. opened a shipyard on the Swan Hunter site in 1873 and this was taken over by C.S. Swan in 1874. Following his death in 1879, the firm was acquired by G.B. Hunter and became Swan and Hunter. The firm took over the adjacent Schlesinger, Davis and Co. yard in 1897 and further expansion took place to the north in 1903 when Swan Hunter merged with Wigham Richardson to tender for the construction of the *Mauretania*. Associated with this expansion was major development works including terracing of the northern part of the main portion of the current site.
- 2.5.21 In 1966, Swan Hunter and Wigham Richardson merged with Smith's Dock Co. to form Associated Shipbuilders, later to become Swan Hunter Group, and in 1977 the company was nationalised. The firm went on to build amongst other ships for the Royal Navy, HMS *Ark Royal*. After having been privatised again in the 1980s, the firm eventually closed in 2007 and the land occupied by the shipyard was sold to North Tyneside Council in 2009.

3. PROJECT AIMS AND RESEARCH OBJECTIVES

3.1 Project Aims

3.1.1 The overarching aim of the phase of archaeological evaluation herein described was to refine current understanding of the location, depth, extent and significance of archaeological deposits at the site through trial trenching, to inform future development proposals. The work was specifically designed to explore the likelihood of nationally important archaeological remains being uncovered with the aim of, hopefully, quantifying the degree of risk for prospective developers with regard to archaeological remains on the site.

3.1.2 In sum, therefore, the first phase of evaluation was designed to:

- Reduce uncertainty regarding the archaeological implications of future development.
- Quantify the risk of developing the site so that the resource implications are better understood by future potential developers.

3.1.3 A further aim of the work was to allow the compilation of a separate report designed to reflect on lessons learned on the issue of archaeological remains in Enterprise Zones, together with recommendations for how archaeological issues could be approached in these areas in order to enable sustainable growth and maintain standards of conservation identified in the NPPF.

3.1.4 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 period, since the north-western portion of the site lies within the Buffer Zone of the Hadrian's Wall component of the transnational *Frontiers of the Roman Empire* WHS. The site lies in close proximity to *Segedunum* Roman fort, the majority of which is a scheduled 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). In sum, therefore, the site is associated with Roman period archaeological remains of national and international importance. In addition, the western portion of the site was thought likely to encompass the *vicus* that extended southwards from the fort, with the Branch Wall potentially delimiting its eastern extent. Defensive ditches recorded during previous archaeological work ran parallel to the foreshore, possibly delimiting the southern extent of the *vicus* (Figure 3).

- 3.2.2 As a result of its location and notwithstanding the anticipated effects of industrial era land use, the project was considered to have good potential to make a significant contribution to existing archaeological 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 two existing archaeological research frameworks. The first is *Shared Visions: The North-East Regional Research Framework for the Historic Environment* (NERRF), which highlights the importance of research as a vital element of development-led archaeological work (Petts and Gerrard 2006). The second is the two-volume *Frontiers of Knowledge: A Research Framework for Hadrian's Wall* (Symonds and Mason 2009).
- 3.2.3 The NERRF identifies the following key priority within the research agenda for the Roman period which is of direct relevance to the 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 as highlighted in the Research Agenda (both in Volume I of the document). A prioritised set of objectives was devised within eight main themes, one of which 'S.4 The Wall', contains the objective of 'Understanding the Wall' which underlines the necessity of '*Establishing the course and survival of the Wall and its installations on Tyneside and the West*'.
- 3.2.5 In sum, the archaeological evaluation of the Swan Hunter 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 position of the Branch Wall, the *vicus*, foreshore defences or any other element of the frontier;
 - to provide the basis for exploring the feasibility of preserving *in situ* any remains deemed regionally or nationally significant through engineering design; and
 - to inform the scope and design of other mitigation measures, should they be deemed to be required.

4. ARCHAEOLOGICAL METHODOLOGY

4.1 Fieldwork

- 4.1.1 The evaluation fieldwork was undertaken 22 July-21 August 2013. All fieldwork was undertaken in accordance with the relevant standard and guidance document of the Institute for Archaeologists (IfA) (IfA 2008a). PCA is an IfA-Registered Organisation. The evaluation was undertaken according to the aforementioned Specification compiled by Dave Heslop, Tyne and Wear County Archaeologist, (included as Appendix 6 to this report) which should be consulted for full details of methodologies employed regarding archaeological excavation, recording and sampling. Capita Symonds compiled a Brief for the evaluation which included the aforementioned archaeological sensitivity plan highlighting the potential for Roman remains across the site (Figure 3).
- 4.1.2 Archaeological trial trenching was considered as the most appropriate investigative tool to test the archaeological potential of the site. Ten trenches (Trenches 1-4 and 6-11) were located within the LDO boundary with the majority located within areas allocated as either Grade 1 (high) or Grade 2 (medium) potential for Roman archaeological remains. Some trenches specifically targeted areas of high potential in order to provide the most productive archaeological information. These include Trenches 6 and 7, located across the presumed course of the Branch Wall, and Trench 2, located within an area where antiquarian accounts have reported Roman structural remains.
- 4.1.3 A summary of the rationale for the evaluation trenching, with historic map background, is set out below:
- Trench 1 (indicative dimensions 30m x 2m). Located towards the western end of the main portion of the site, on the northern end of a mound of rough ground west of the Wet Dock basin. This trench aimed to ascertain the position of the original riverfront, and the presence/absence of Roman riverside features. It was located in an area of high (Grade 1) potential for Roman remains. The first edition Ordnance Survey map of c. 1860 indicates that this was one of the first parts of the site to be developed, with a 'Crane House' depicted in this area above the river bank, as it was at the time (Figure 12). By the 20th century, by which time the riverfront had moved southwards by some distance through groyning, reclamation and canalisation, Ordnance Survey mapping shows this part of the site as heavily developed with substantial dockside structures and a network of crane rails occupying land reclaimed from tidal mud-flats (Figure 13).
 - Trench 2 (20m x 2m). Located towards the north-western boundary of the main portion of the site, in an elevated area of shrubbery overlooking the Wet Dock basin and south of the Hadrian's Cycleway, this trench aimed to evaluate a broad area in which well-preserved Roman structural remains, including antiquarian accounts of a bath house, have been recorded over a long period. This was located in an area of high (Grade 1) potential for Roman remains.

The first edition Ordnance Survey map indicates that this area was undeveloped at the time, simply a field on the upper valley side, 'Wall Laws', between the site of the Roman fort and the river bank at the time (Figure 12). By the 20th century, Ordnance Survey mapping shows that this part of the site was occupied by railway sidings in the northern part of the shipyard, lying to the south of the railway which ran between Low Walker and Wallsend Colliery and whose line is fossilised in the landscape as Hadrian's Cycleway (Figure 13).

- Trench 3 (10m x 2m). Located towards the north-western boundary of the main portion of the site, on a terrace to the south of the Hadrian's Cycleway, this trench aimed to investigate the degree of survival of archaeological remains in an area formerly occupied by buildings associated with the shipyard and on the line of the Roman road which ran south from the fort. This was located in an area of moderate (Grade 2) potential for Roman remains. The first edition Ordnance Survey map indicates that Trench 3 lay in the same undeveloped part of the valley side as Trench 2, between the site of the Roman fort and the river bank (Figure 12).
- Trench 4 (15m x 2m). Located towards the north-western boundary of the main portion of the site, on a grassed slope between a concrete roadway and the north end of the Wet Dock, this trench aimed to ascertain the position of the original river edge and the presence/absence of Roman riverside features. This was located in an area of high (Grade 1) potential for Roman remains. Like Trenches 2 and 3, Trench 4 lay in the same undeveloped part of the valley side as depicted on the first edition Ordnance Survey map (Figure 12). By the 20th century, Ordnance Survey mapping depicts the area in which the trench was sited occupied by a substantial gantry at the north end of a dock (now the surviving Wet Dock) within the shipyard (Figure 13).
- Trenches 6 and 7 (15m x 2m). Both located in the northern central part of the main portion of the site, on the concrete shipyard deck north of the Dry Dock basin, in an area where the ground is likely to have been disturbed by deep cuttings for the crane rails, this trench aimed to ascertain the presence/absence of the Branch Wall, based on its presumed line. These were located in an area of high (Grade 1) potential for Roman remains. The first edition Ordnance Survey map indicates that Trench 6 was sited just east of and below the river bank (and High Water Mark) at the time, therefore on tidal mud flats, prior to reclamation and narrowing of the river channel (Figure 12). In contrast, Trench 7 was sited just west of and above the river bank, therefore on the lowermost slope of the valley side field, prior to reclamation and narrowing of the river channel. By the 20th century, Ordnance Survey mapping shows that this part of the site was occupied by core components of the shipyard (Figure 13).
- Trench 8 (20 x 2m). Located in a tarmac car park in the north-western part of the smaller northern portion of the site adjacent to Buddle Street, this trench was sited on the probable alignment of the eastern road from the fort and adjacent to an area previously investigated to the north which revealed evidence of agriculture to the north-east of the fort. This was located in an area of moderate (Grade 2) potential for Roman remains.

The first edition Ordnance Survey map indicates that Trench 8 was sited on the higher valley side to the south of Wallsend Station in an overall area affected by the onset of industrialization (Figure 12). Ahead of the construction of the shipyard, the riverside to the south was occupied by Wallsend Chemical Works and various coal workings are depicted in the area, including Wallsend Colliery to the west. By the 20th century, Ordnance Survey mapping shows that this part of the site was occupied by railway sidings and a goods shed associated with Carville Station which lay on the railway whose line is fossilised in the landscape as Hadrian's Cycleway (Figure 13).

- Trench 9 (15m x 2m). Located towards the central northern boundary of the main portion of the site, on a terrace to the south of the Hadrian's Cycleway, this trench aimed to test the effect of modern terracing on both the natural ground level and archaeological remains. This was located in an area of medium (Grade 2) potential for Roman remains. The first edition Ordnance Survey map indicates that Trench 9 was sited on the largely undeveloped higher valley side overlooking Wallsend Chemical Works, possibly on the line of a road or track running down slope to the works (Figure 12). By the 20th century, Ordnance Survey mapping shows that this part of the site was occupied by the railway sidings mentioned above and lay immediately adjacent to structural components in the northernmost part of the shipyard (Figure 13).
- Trench 10 (20m x 2m). Located in the south-eastern part of the smaller northern portion of the site, on an area of waste ground, this trench aimed to test for the presence/absence of Roman period remains, in order to help define the eastern edge of activity, such as agriculture, beyond the fort. This was located in an area of medium (Grade 2) potential for Roman remains. The first edition Ordnance Survey map indicates that Trench 10 was sited on the higher valley side above Wallsend Chemical Works and south of a reservoir (Figure 12). By the 20th century, Ordnance Survey mapping shows that this part of the site was occupied by railway sidings associated with the railway whose line is fossilised in the landscape as Hadrian's Cycleway (Figure 13).
- Trench 11 (20m x 2m). Located in the northernmost part of the main portion of the site, on an area of rough hardstanding, this trench aimed to test for the presence/absence of Roman period remains, in order to help define the eastern edge of activity, such as agriculture, beyond the fort. This was located in an area of medium (Grade 2) potential for Roman remains. The first edition Ordnance Survey map indicates that Trench 11 was sited on the higher valley side above Wallsend Chemical Works, west of an 'Old Staith' (Figure 12). By the 20th century, Ordnance Survey mapping shows that this part of the site was occupied by railway sidings associated with Carville Station which lay on Hadrian Road, on the north side of the railway whose line is fossilised in the landscape as Hadrian's Cycleway (Figure 13).

- 4.1.4 The 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 operative. The Smart Rover GNSS provides correct Ordnance Survey co-ordinates in real time, to an accuracy of 1cm.

- 4.1.5 Due to access restrictions, trenches were excavated by mechanical excavators of various sizes, all using toothless ditching buckets. All ground reduction was carried out under archaeological supervision. Trenches 1, 4, 6 and 7 were excavated by a 13-tonne 360° tracked machine, Trenches 2 and 3 were excavated by a c. 3-tonne 360° tracked machine, Trenches 8, 10 and 11 were excavated by a back-acting 'JCB' and Trench 9 was excavated by a c. 1.5-tonne 360° tracked machine.
- 4.1.6 The trenches were excavated to the top of the first significant archaeological deposit or structure, or the clearly defined top of the natural sub-stratum, or to the maximum depth permitted by Health and Safety considerations, whichever was reached first.
- 4.1.7 All trenches were hand cleaned and then photographed and archaeologically recorded, with sample excavation of features where necessary.
- 4.1.8 Temporary Bench Marks (TBMs) were established across the site using the Smart Rover. The height of all principal strata and features were calculated relative to Ordnance Datum and indicated on the appropriate plans and sections.
- 4.1.9 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 work. The Specification stipulated that 30–40 litre samples should be taken and that all material should be processed, not just a sub-sample. In practice, it was not possible to recover samples of this size from the deposits which were identified as having the highest potential for palaeoenvironmental remains due to the fact that only small portions of features were exposed or because of logistical constraints.

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 161 archaeological contexts were defined in the ten evaluation 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 encountered within each trench was then compiled, as described below in Section 5.
- 4.2.2 The artefactual material from the evaluation comprised a small assemblage of pottery and ceramic building material. Individually referenced finds comprising a pierced stone disc, worked antler and a flint flake were also recovered. Specialist examination of the artefactual material was undertaken and relevant comments integrated into Section 5, with a report on the pottery, ceramic material and Roman period small finds included as Appendix 3. A small assemblage of faunal remains was also recovered; specialist examination of the material was undertaken with a report on the material included as Appendix 4. 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 With regard to palaeoenvironmental sampling, three bulk samples were collected, one from the fill of a Roman ditch re-cut in Trench 4, one from a Roman or post-Roman developed soil from Trench 3 and one from a humic deposit thought to represent a foreshore or mudflat deposit in Trench 6. A report on the assessment of these samples is included as Appendix 5.
- 4.2.4 Following the fieldwork, the lessons learned report was compiled; this designed to reflect on lessons learned on the issue of archaeological remains in Enterprise Zones, together with recommendations for how archaeological issues could be approached in these areas in order to enable sustainable growth and maintain standards of conservation. The lessons learned report has been integrated into this report.
- 4.2.5 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 IfA publication (IfA 2008b). 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 below for each trench in turn, with stratigraphic entities assigned to a scheme of broad phases assigned on a site-wide basis.

5.1 Trench 1 (Figure 5; Section 5, Figure 10; Plates 1 and 2)

Phase 1: Natural Sub-stratum

- 5.1.1 The natural clay sub-stratum was exposed for a maximum distance of c. 2m by 2m within a machine-excavated sample excavation located centrally within Trench 1. The deposit was recorded and the sample excavation immediately backfilled due to Health and Safety considerations. The deposit, [120], comprised stiff mid brownish pink clay, encountered at a depth of c. 5m below present ground level and recorded at a maximum height of 3.90m OD. Although only a small area of this deposit was exposed, it is considered likely that this natural sub-stratum has been horizontally truncated by industrial and/or modern era activity in this area.

Phase 4: Late 19th-Century Industrial

- 5.1.2 Directly overlying natural clay [120] was a c. 0.40m thick layer, [119], of firm silty clay recorded at a maximum height of c. 4.30m OD. This deposit is tentatively interpreted as a levelling deposit of 19th-century date. Two scraps of ceramic building material of Roman date recovered from the deposit were probably residual in context.
- 5.1.3 Substantial layered 'ballast' deposits of various compositions of sand and gravel, [75]–[70], were recorded overlying deposit [119]. Such deposits were exposed for a maximum distance of 7.40m NW-SE within the central portion of the trench. The combined maximum thickness of these deposits was 2.80m, with the uppermost material encountered at a maximum height of c. 6.15m OD. These deposits are interpreted as representing dumping undertaken during the mid-19th century, this activity associated with reclamation of the foreshore and narrowing of the river channel.
- 5.1.4 Directly overlying ballast deposit [75] was part of a substantial concrete structure, [79], which was exposed for a maximum distance of 1.20m NE-SW by 1.10m NW-SE. Due to the limited degree that it was possible to expose this structure, interpretation is uncertain, however it potentially represents part of a shipyard structure depicted at this location on the Ordnance Survey map of 1916 (Figure 11) and perhaps dates to the late 19th century.

Phase 5: 20th-Century Industrial

- 5.1.5 A clayey sandy silt deposit, [69], overlay structure [79] and ballast [70]. Where exposed, this deposit extended across the width of the trench and was recorded for a distance of 8.70m NW-SE and was up to c. 0.90m thick. It was encountered at a maximum height of 6.87m OD. This deposit had evidently been laid down prior to a concrete slab, [54], and is interpreted as a levelling and consolidation deposit directly associated with the construction of the surface.

- 5.1.6 Concrete slab [54] and an associated timber structure, [78], were partially exposed within the south-eastern portion of Trench 1 for a combined maximum distance of 7.50m NW-SE by 3m NE-SW. The concrete slab, exposed for a maximum distance of 5.50m NW-SE by 3m NE-SW, had a level surface recorded at a height of 6.57m OD. Set upright within the surface was a substantial iron pipe 550mm in diameter. Timber structure [78], located immediately to the south-east of the concrete slab, comprised at least two stacked roughly square platforms measuring 1.85m by 1.75m and 0.50m thick, recorded at a maximum height of 5.27m OD. Each platform was constructed with ten timber beams fixed vertically with iron bolts and horizontally with four L-shaped iron clasps and associated bolts. The platforms were set in stiff mottled clay deposits, [76] and [77], with a combined maximum thickness of at least 1.10m.
- 5.1.7 These remains again potentially represent part of the shipyard structure depicted at this location on the Ordnance Survey map of 1916 (Figure 11); alternatively they may represent a later development - substantial buildings with an associated network of rails are depicted in this area on mapping throughout the 20th century.

Phase 6: Modern

- 5.1.8 Modern ground-raising and levelling deposits, [68] and [55], comprising coarse sand with a maximum combined thickness of 0.40m, overlay a thick levelling deposit, [69], which had been dumped to the north of concrete surface [54]. At the north-west end of the trench deposit [55] was overlain by a 150mm thick concrete surface, [53], that represents the continuation of the existing current ground surface to the north-east of the trench. The surface had two NNE-SSW aligned iron rails incorporated within it and a similarly aligned gully and the remains of a brick retaining wall were also recorded, east of the rail track. The surface and associated structures were encountered at a depth of c. 0.85m below present ground level and they were recorded at a maximum height of 7.03m OD.
- 5.1.9 The uppermost deposit recorded across the majority of Trench 1 comprised a c. 0.90m thick layer, [52], of compact brick rubble, which formed the existing ground surface. The uppermost deposit recorded at the south-east extent of the trench comprised a c. 0.30m thick layer, [51], of sandy silty gravel, which contained modern refuse material and formed part of an extensive dump deposit observed extending eastwards across the western extent of the site.

5.2 Trench 2 (Figure 6; Sections 10–12, Figure 10; Plates 3 and 4)

Phase 1: Natural Sub-stratum

- 5.2.1 The natural sub-stratum was exposed along the base of Trench 2 for the majority of its length and comprised stiff mid pinkish brown clay, [134]. At the northern end of the trench the deposit was encountered at a relatively shallow depth of c. 0.20m below present ground level, at a maximum height of c. 14.80m OD. It fell away sharply to the south-west and was recorded at a depth of c. 3m below ground level, at a minimum height of c. 12.00m OD, towards the south-western extent of the trench. Although it appeared that the deposit had been horizontally truncated along the length of the trench, the downward slope to the south-west probably broadly corresponds with the natural topography of this part of the site.

Phase 3: Roman

- 5.2.2 Recorded in the south-western portion of the trench were two intercutting features, [133] and [143], cut into the natural clay. The relationship between these features could not be determined, due to the similar composition of their fills. The western side of a presumed linear feature, [133], was recorded for a distance of 1.65m NE-SW and was at least 0.87m wide and 0.40m deep (Section 11). Its single fill, [132], comprised compact clay and stones, from which Roman artefactual material, comprising two fragments of burnt daub, seven pieces of ceramic building material and two sherds of second-century AD or later pottery, was recovered. Most of the building material was in fragmentary form, although it was clearly identifiable as being Roman in date, however there was also a fragment of *tegula* (roof tile). The fabric of this tile is typical of examples found in the fort; tiles from *Segedunum* are often poorly made and the *tegula* includes large pebble fragments which are characteristic of poorly prepared clay (see Appendix 3). Linear feature [133] possibly represents a 'robbed out' wall, *i.e.* a trench dug to remove masonry from an *in situ* structure. The second feature, [143], was irregular in plan, measuring at least 0.75m east-west by 1.20m north-south and up to 0.22m deep (Section 12). Its single silty clay fill, [142], yielded no artefactual material and it is tentatively interpreted as a pit. These features were encountered at a depth of c. 2.20m below existing ground level, at a maximum height of c. 12.60m OD, although the ground surface from which they were originally cut is likely to have been horizontally truncated, probably since the late post-medieval industrial era.

Phase 4: Late 19th-Century Industrial

- 5.2.3 Industrial era ballast deposits, comprising various compositions of clay, sand, ash and crushed coal, [131]–[127], overlay the Roman features in the deeper, south-western portion of the trench and continued northwards, decreasing in thickness. These deposits had a combined maximum thickness of c. 2.70m to the south-west and were encountered at a maximum height of c. 14.80mOD, petering out to the north. These deposits were likely dumped onto the sloping valley side sometime after the mid-19th century in order to level the ground ahead of the construction of the railway which skirted the northern site boundary and a series of railway sidings associated with the shipyard, as depicted on the 1916 Ordnance Survey map (see Figure 11).

Phase 6: Modern

- 5.2.4 The present ground level in the area of Trench 2 comprised loose topsoil, [126], directly overlying the previously described ballast deposits to the south-west and truncated natural clay to the north-east, encountered at a maximum height of c. 15.00m OD.

5.3 Trench 3 (Figure 6; Section 2, Figure 10; Plate 5)

Phase 1: Natural Sub-stratum

- 5.3.1 A small area of natural clay sub-stratum was exposed at the south-west extent of Trench 3 over an area measuring c. 1.40m by 0.30m. The deposit, [144], comprised firm mid yellowish brown clay, encountered at a depth of c. 2.0m below present ground level at a maximum height of c. 12.40m OD.

Phase 3: Roman

- 5.3.2 Directly overlying natural clay was a c. 0.30m thick deposit, [141], which comprised fragmented sandstone within a firm dark grey silty clay matrix. This deposit was exposed across the whole of the base of the trench, at a depth of c. 1.70m below present ground level and was recorded at a maximum height of 13.02m OD. No artefactual material was recovered from the deposit, which potentially represents a surface, possibly that of the Roman road which ran to the south of the fort.
- 5.3.3 Overlying the putative stone surface were two deposits, [140] and [139], with a maximum combined thickness of up to 0.70m, recorded at a maximum height of 13.40m OD. Layer [140] yielded a single sherd of fairly abraded second-century or later samian pottery (Appendix 3). The residue from a bulk sample taken from deposit [140] contained small quantities of fragmented coal and clinker/cinder and a few indeterminate fragments of unburnt bone (Appendix 5). Charred plant macrofossils were sparse apart from a few hulled barley grains. Identified charcoal largely comprised Maloideae (hawthorn, apple, whitebeams), with fragments of oak stemwood/sapwood and hazel branchwood recorded. The charred plant remains and finds recovered deposit [140] are typical of domestic waste. Deposits [140] and [139] are provisionally interpreted as developed soils, which may have developed over a long period during the Roman and post-Roman period.

Phase 4: Late 19th-Century Industrial

- 5.3.4 Industrial era dumped deposits, [137] and [138], directly overlay the Phase 3 layers and these had a combined maximum thickness of c. 1.10m. The uppermost deposit was recorded at a maximum height of 14.12m OD. As with deposits in Trench 2, this material is interpreted as representing levelling activity associated with the construction of the shipyard railway sidings and adjacent railway depicted on the 1916 Ordnance Survey map (see Figure 11).

Phase 6: Modern

- 5.3.5 In Trench 3, the uppermost Phase 4 dumped deposit, [137], was overlain by modern deposits probably associated with a structure that is known to have formerly occupied this part of the site. These comprised a c. 0.15m thick sand and ash levelling deposit, [136], overlain by a geotextile membrane, with the existing ground surface comprising a c. 0.20m thick deposit of limestone/dolomite 'roadstone', [135].

5.4 Trench 4 (Figure 6; Sections 3 and 4, Figure 10; Plates 6 and 7)

Phase 1: Natural Sub-stratum

- 5.4.1 Natural clay sub-stratum was exposed along the entire basal length of Trench 4, falling away to the south-east, and comprised stiff mid brownish pink clay, [50]. Towards the north-western end of the trench, the deposit was encountered at a depth of c. 0.50m below ground level. Overlying the clay in the north-westernmost c. 1.20m of the trench was an increasing thickness of stratified deposits.

- 5.4.2 To the south-east, the natural clay had been truncated by a substantial cutting forming the existing access to the Wet Dock, this encountered at a very shallow depth, as little as c. 70mm, below existing ground level. Therefore, natural clay was encountered at maximum and minimum heights of 7.15m OD and 4.17m OD, respectively, in Trench 4; these values being indicative of the location of the trench on steeply sloping ground between an access road to the north-west and the access to the Wet Dock to the south-east.

Phase 3: Roman

- 5.4.3 At the extreme north-western extent of Trench 4, stratified deposits of proven or assumed Roman date were recorded. To the south-east, these deposits had been truncated by the aforementioned cutting for the Wet Dock, so that the Roman strata survived in section in an increasing thickness to the north-west, up to a maximum of c. 2.20m, continuing beyond the north-west, north-east and south-west limits of excavation, to the north-west below the aforementioned access road. These stratified Roman deposits were encountered at maximum and minimum heights of 8.32m OD and 7.07m OD, respectively.
- 5.4.4 The earliest features recorded in Trench 4 comprised two adjacent roughly NE-SW aligned ditches, [41] and [49], cut into the natural clay, with associated re-cuts [40] and [47], respectively, recorded at a maximum height of 7.15m OD (Section 4). The north-westernmost of these ditches, [41], was recorded for a maximum distance of c. 4.60m NE-SW and was at least 1.70m wide and up to c. 0.90m deep. Only the south-eastern side of this ditch was exposed and it had a stepped, gradually sloping profile. Its primary fill, [42], comprised a c. 40mm thick humic deposit, overlain by a more substantial clay fill, [39]. A single sherd of second-century AD or later flagon was recovered from fill [39]. A pierced stone disc (SF2), possibly a spindle whorl, was also recovered from this deposit. Such stone discs are rare for this area, with only one other similar example recovered from the *vicus* to the north (see Appendix 3).
- 5.4.5 The upper fill, [39], of ditch [41] was truncated by re-cut [40] and was recorded for a maximum distance of c. 4.60m NE-SW and was at least 1.40m wide and up to 0.64m deep. Only the south-eastern portion of the re-cut was exposed and its profile comprised a vertical side with a sharp mid break of slope at a 30° angle leading to a flat base. The angular nature of the profile suggests that the re-cut originally may have been timber-lined. Its single fill, [34], comprised a humic 'peaty' deposit from which a small assemblage of domestic animal bone from cattle, pig and sheep was recovered (Appendix 4). The faunal remains were in very good condition, presumably due to the waterlogged nature of the deposit. A single sherd of pottery, an unidentified oxidised ware of possible modern date, was recovered from this deposit, but this is assumed to represent an intrusive find. A piece of worked antler (SF1) with knife cuts and saw marks was also recovered from this deposit (Appendix 3).

- 5.4.6 Due to the limited exposure of the ditch, it was only possible to collect a small bulk sample from fill [34] to assess its potential for palaeoenvironmental remains. However, this sample did demonstrate the presence of significant palaeoenvironmental remains (Appendix 5). The residue contained small quantities of fragmented coal and clinker/cinder, fired clay and fire-cracked stones. Charcoal fragments included oak, hazel, alder, birch and blackthorn, indicating the exploitation of a diverse range of taxa. All this material, along with the worked antler, suggests that industrial activity may have been undertaken in the area. The sample residue also contained small fragments of pottery, calcined and unburnt bone (fish and sheep-sized bone were noted) and mussel shell.
- 5.4.7 Charred plant macrofossils were sparse in the sample from ditch fill [34], but a few hulled barley grains were present. The charred plant remains and finds from the deposit are broadly indicative of domestic waste. Uncharred plant remains, preserved due to waterlogged conditions, included taxa such as agrimony, black-bindweed, pale persicaria, hemp-nettle, buttercup, spike-rushes, ribwort plantain and sedges. These plants are typical of damp ground, arable, open grassland and scrub. Fragments of wood were a common feature in the deposit and many were roundwood (including bark). Several fragments were identified as heather twigs and three to four-year old hazel branchwood and sphagnum moss and an uncharred hazel nutshell were also noted. Invertebrate remains were also present, including fly puparia. Vivianite, a bluish mineral which is sometimes encountered in archaeological deposits, was also present in the sample; this mineral is typically found in association with human remains, human and animal waste deposits, industrial waste deposits and areas rich in iron. The accumulation of the humic deposit within the ditch was no doubt due to the local waterlogged conditions and the partial decay of the vegetation suggests waterlogged conditions have prevailed, possibly since the ditch was in use.
- 5.4.8 Located immediately to the south-east of ditch [41] was a similarly NE-SW aligned ditch, [49], recorded in section measuring c. 1.60m wide by up to 0.80m deep. This was potentially contemporary with ditch [42], perhaps forming a double-ditch arrangement, however a stratigraphic relationship between the features could not be established. No artefactual material was recovered from its single clay fill, [48]. A ditch re-cut, [47], was recorded, truncating fill [48] and this measured c. 1.15m wide by c. 0.50m deep. A piece of burnt daub and a fragment of cattle bone were recovered from its single, slightly humic, silty clay fill, [46].
- 5.4.9 An oval shaped feature, [158], was recorded, cutting fill [39] of ditch [41] at its western extent. This measured 0.50m NW-SE by 0.30m NE-SW and was up to c. 0.30m deep, encountered at a maximum height of 6.45m OD. Its clayey silt fills, [157] and [156], yielded no artefactual remains and it is provisionally interpreted as a posthole, with stone recorded within fill [156] potentially representing packing material.
- 5.4.10 Two intercutting, presumed linear, features, [36] and [38], were recorded in section cutting ditch fill [34] (Section 3). The earliest, feature [36], was recorded for a distance of c. 1.0m NE-SW and was at least 0.15m deep. Its single gravelly fill, [35], yielded no artefactual material. This was truncated to the north-east by feature [38], which was recorded for a distance of c. 1.80m NW-SW and was at least 0.30m deep. One fragment of animal bone was recovered from its single silty clay fill, [37]. These features may represent further ditch re-cuts, however as only small portions were exposed in section, definitive interpretation is difficult.

- 5.4.11 Overlying ditch fill [34] and features [36] and [38] was a c. 0.35m thick silty clay layer, [33], interpreted as a levelling deposit for the overlying stone surface, [32]. The surface was c. 0.15m thick and was recorded at a maximum height of 7.45m OD. Deposit [33] produced six sherds of Roman pottery, the latest material in the assemblage dated to the third century AD, and the overlying surface produced three sherds, the latest dated to the second century AD or later (Appendix 3). A small quantity of animal bone was also recovered from these deposits. Surface [32] was overlain by a sequence of generally clayey silt deposits, [29], [28], [27], [26], with a combined maximum thickness of c. 1.0m. Small assemblages of late second- to third-century AD pottery were recovered from the three uppermost deposits along with a fragment of cattle bone. The uppermost of this group of deposits was encountered at a maximum height of 8.32m OD, this immediately below the 0.60m thick concrete road surface to the north-west of the trench and also below the 0.40m thick topsoil that formed the existing ground surface along the south-west side of the trench. This group of deposits is interpreted as representing refuse derived from the Roman settlement area to the north. The majority of the unstratified assemblage of Roman pottery (approximately 75 sherds), Roman building material (5 fragments) and animal bone (approximately 25 fragments) recovered during machine clearance and hand cleaning of the trench are considered likely to have derived from this group of deposits. The building material included a fragment of box tile with comb keying and the edge of a pantile, these typical of the fabric and type of tile known from the fort (Appendix 3).
- 5.4.12 A single, presumed linear, feature, [31], was recorded in section cutting refuse deposit [29]. This was c. 0.70m wide and up to 0.18m deep and yielded one sherd of pottery and a fragment of building material from its single, silty clay fill, [30]. The feature probably represents a shallow drainage feature.

Phase 6: Modern

- 5.4.13 Located immediately to the north of Trench 4 was a c. 0.60m thick concrete road surface [43], recorded at a maximum height of 9.30m OD. This surface directly overlay the sequence of stratified Roman remains described above.
- 5.4.14 Immediately to the south-east of road surface [43] and directly overlying the Roman deposits was a soft, clayey silt deposit, [45], that was present only within the north-west extent of the trench. It was exposed for a distance of 9.10m NE-SW by c. 2.50m NW-SE and was up to 0.20m thick. It was encountered at maximum and minimum heights of 8.30m OD and 7.30m OD, respectively, and probably represents a modern levelling deposit.
- 5.4.15 Layer [45] was overlain by c. 0.40m thick topsoil, [43], that formed the existing ground surface along the south-western (and north-eastern) side of the trench.

5.5 Trench 6 (Figure 7; Section 1, Figure 10; Plates 8 and 9)

Phase 2: Foreshore Deposit

- 5.5.1 The earliest deposit encountered in Trench 6 was a soft, black humic clayey deposit, [80], exposed within a machine-excavated sample excavation at the north-eastern extent of the trench at a depth of c. 5.70m below present ground level, at a maximum height of c. 1.30m OD. As with the basal deposits in Trench 1, the deposit was sampled and recorded and the sample excavation immediately backfilled due to Health and Safety considerations.
- 5.5.2 Deposit [80] is provisionally interpreted as a probable former foreshore deposit. The sample residue contained small quantities of fragmented coal and clinker/cinder, a few fragments of unburnt bone and two cockle shells (Appendix 5). Fragments of wood were common in the deposit, along with uncharred plant macrofossils also preserved under waterlogged conditions, including weed seeds such as black-bindweed, fat-hen, dock and daisy family, and fruitstones of bramble and elder. These species are typical of waste ground and may have been preserved on the former foreshore in anaerobic conditions. A more uncommon occurrence were hop seeds, with the low numbers recorded suggesting these represent weeds growing on waste ground, which is further supported by the presence of the other species typical of such an environment. The presence of hop seeds potentially indicates a late medieval or post-medieval origin.

Phase 4: 19th century industrial

- 5.5.3 Overlaying deposit [80] were layered, predominantly sand and gravel, ballast deposits, [17], which extended along the trench. These had a combined maximum recorded thickness of c. 4.25m and were encountered at a maximum height of c. 5.55m OD. In turn, the ballast was overlain by a c. 0.95m thick layer, [15], of clay - re-deposited natural clay - which had evidently been dumped upon the looser ballast material to form a consolidation layer ahead of 19th-century development.
- 5.5.4 The remains of 19th-century industrial era structures were recorded overlying consolidation deposit [15]. This included four brick-built structures: a portion of NE-SW aligned wall, [9], at the north-eastern end of the trench; two possible furnace bases, [159] and [22], recorded centrally and at the south-western extent of the trench and a substantial, roughly north-south aligned, brick culvert [153] at the south-western extent of the trench. These structures were probably associated with a substantial rectangular building depicted in the shipyard on the second edition Ordnance Survey map of the 1890s (not reproduced herein).
- 5.5.5 Brick wall [9] was exposed in section for a distance of 2.80m NE-SW, surviving up to 0.48m high and had been constructed upon a c. 80mm thick ashy silt bedding deposit, [10]. Although a construction cut was not seen, due to the oblique angle at which the structure met the section, an ashy silt deposit, [7], to the north-east is likely to represent the backfill of the construction cut. To the south-west of the wall, a silty ash and clinker deposit, [8], probably represents infill of the structure, this material presumably being residue derived from its use, which indicates that it was an industrial structure.

- 5.5.6 A probable furnace structure, [159], was partially exposed in section measuring c. 3.0m NE-SW by up to 0.40m high. Its broad construction cut, [14], measured at least 5.0m NE-SW by up to 1.80m deep. At the base of the cut was a substantial concrete footing, [16], which was up to 0.50m thick. The surviving portions of the outer walls, [13] and [18], were built in red brick (230mm x 110mm x 70mm) 0.20m wide and these components of the overall structure survived to a maximum height of up to 0.40m. Internally, the structure was lined with 'skins', [81] and [82], of firebricks (240mm x 110mm x 60mm) up to 0.20m thick, and its floor, [19], was formed by a single course of firebricks. On disuse, the structure remained infilled by an ashy silt deposit, [11].
- 5.5.7 Another structure of possibly similar function was recorded in section towards the south-western end of Trench 6. This was built within a broad construction cut, [24], measuring c. 2.50m wide and surviving up to 0.50m deep. At its base was a c. 0.20m thick concrete footing, [23]. A portion of only the south-western wall, [22], of the structure survived and this was built in red brick (230mm x 110mm x 65mm) and was 0.36m wide, surviving to a height of 0.35m. A single firebrick was recorded at its north-east extent, probably a remnant of a protective inner 'skin'. The survival of this structure was poor as it had been truncated by a substantial demolition feature, [21], recorded in section measuring up to 5.10m wide and 1.20m deep and backfilled with a loose, sandy silt deposit, [20], that contained brick and sandstone rubble.
- 5.5.8 A substantial, roughly north-south aligned, arched brick culvert, [153], was recorded for a distance of c. 7.0m running across the south-western end of the trench. At least 2.30m wide it was of late 19th century or later date.

Phase 6: Modern

- 5.5.9 Features and deposits representing demolition and truncation of probable 20th-century date, were recorded overlying the structural remains recorded in Trench 6. The uppermost strata in the trench comprised a c. 1.0m thick levelling deposit, [6], which was overlain by a 300mm thick, concrete surface, [5], with steel-mesh reinforcing, forming the former shipyard deck.

5.6 Trench 7 (Figure 7; Section 6, Figure 11; Plate 10)

Phase 1: Natural Sub-stratum

- 5.6.1 The natural clay sub-stratum, [62], comprising stiff brownish grey clay, was exposed across the base of Trench 7, at a relatively shallow depth, c. 0.70m below ground level, at a maximum height of c. 7.25m OD. Machine probing in excess of c. 3.50m deep was undertaken at two locations along the central axis of the trench to confirm that the deposit was *in situ* natural material, rather than re-deposited material. This demonstrated that this part of the site had evidently been subject to severe horizontal truncation during its development as the shipyard in the late 19th and 20th centuries.

Phase 4: 19th-Century Industrial

- 5.6.2 A substantial brick surface, [60], up to 0.30m thick, was recorded in section in Trench 7 for a distance of 8.20m NE-SW. It was encountered c. 0.60m below ground level, at a maximum height of c. 7.20m OD; to the north-east, it began to rise, this presumably part of its original design. The surface had been constructed using a sloping soldier course of red bricks (230mm x 110mm x 70mm), bonded with a light grey mortar, bedded on a c. 40mm thick layer, [61], of silty ash, clinker and crushed coal, this laid directly onto the truncated natural clay. The brick surface likely relates to late 19th-century development of this part of the site as part of the shipyard.

Phase 6: Modern

- 5.6.3 A substantial concrete service duct, [1], was exposed running obliquely across the south-eastern part of the trench, immediately below the current concrete surface, [56], of the shipyard deck. This was contained within a narrow construction cut [3], which truncated the natural sub-stratum and was infilled by silty clay [2].
- 5.6.4 Abutting the service duct at the north-western corner of the trench was part of a substantial concrete structure, [4]. This was recorded within a narrow construction cut, [154], and was exposed for a maximum length of c. 3.30m NW-SE and was c. 1.60m wide. This structure probably represents a machine base associated with late 20th-century activity at the shipyard. A loose rubble deposit, [155], recorded immediately to the west of this structure represents demolition infill following disuse of the structure.
- 5.6.5 A roughly NE-SW aligned service trench, [63], was recorded in section in the central portion of the trench, to the south-west cutting through brick surface [60]. This contained a ceramic pipe within concrete, [65], and had been backfilled with c. 0.40m thick clay deposit, [64]; brick surface [60] had evidently then been reinstated along the line of the service trench, as a less-well-built surface, [67], this rising gradually to the north-east.
- 5.6.6 Directly overlying surface [60] were the remains of a former concrete surface, [58], up to 0.38m thick, which in turn was overlain by a c. 40mm thick stone bedding deposit, [57], and, to the north-east, a concrete levelling deposit, [66], for the 0.25m thick concrete surface, [56], with steel-mesh reinforcing, which formed the deck of the former shipyard.

5.7 Trench 8 (Figure 8; Section 8, Figure 11; Plates 11 and 12)

Phase 1: Natural Sub-stratum

- 5.7.1 The natural clay sub-stratum, [90], comprising stiff pinkish brown clay, was encountered along the majority of Trench 8, at a minimum of depth of c. 0.50m below existing ground level, the tarmac surface of the car park on which the trench was sited. It was recorded at a maximum height of 22.35m OD, to the north-west, falling away to the south-east and recorded at a minimum height of 21.20m OD, this broadly reflecting the natural topography of the area.

Phase 3: Roman

- 5.7.2 The lowermost portion of what appeared to be a broad ditch, [99], was recorded cutting into the natural clay sub-stratum within the central portion of the trench. It was aligned SW-NE and was c. 3.25m wide by up to 0.38m deep, encountered c. 0.45m below ground level, at a maximum height of 22.58m OD. Its single fill, [98], produced two sherds of Dressel 20 amphora which could only be broadly dated to the Roman period.
- 5.7.3 This feature potentially represents a ditch running alongside the (presumably north) side of the road which ran from the east gate of the fort. Alternatively, it may represent a field boundary associated with agricultural activity conducted in the area to the north-east of the fort. Its relatively shallow depth as recorded is likely to be the result of horizontal truncation which occurred during the later 19th or 20th century when this part of the site was developed for a railway siding, as depicted on Ordnance Survey mapping (for example, see Figure 11).

Phase 4: 19th-Century Industrial

- 5.7.4 A crushed coal and ash deposit, [100], was recorded in section directly overlying ditch [99], extending across the north-western portion of the trench; it was up to 0.42m thick.
- 5.7.5 The south-eastern portion of what was evidently a cutting, [150], for railway track was exposed towards the north-western end of the trench, for a distance of at least c. 3.20m NW-SE, recorded at a maximum height of c. 22.60m OD. Its single fill, [149], comprised crushed coal and ash, representing ballast in which a timber sleeper, [151], was imbedded, this seen adjacent to the south-western section of the trench. This deposit was very similar in composition to deposit [100]. Another timber sleeper, [152], was exposed in plan, aligned NE-SW along the south-eastern edge of cutting [150]. The function of this sleeper is unclear, running as it did, parallel to the line of the cutting, but it may have been laid to delimit the edge of the feature. This track may have been that depicted at this location, to the south-west of a goods shed, on the 1916 edition (and subsequent editions) of the Ordnance Survey map (see Figure 11).

Phase 6: Modern

- 5.7.6 A group of levelling deposits, [89], [86] and [97], recorded across the central and south-eastern extent of Trench 8 had a maximum combined thickness of up to 1.50m. These deposits gradually increased in thickness to the south-east, presumably having been laid to level the naturally sloping ground. The deposits were directly overlain by a c. 0.20m thick dolomite bedding deposit, [85], for the existing 0.25m thick tarmac surface, [84], of the car park.
- 5.7.7 A group of three roughly NE-SW aligned services, [88], [95] and [162], were recorded cutting bedding deposit [85]. Another NE-SW aligned feature, [92], was recorded in section within the south-east portion of the trench, forming a foundation for the extant precast concrete gully, [96], set within the tarmac surface of the existing car park.

5.8 Trench 9 (Figure 8; Section 13, Figure 11)

Phase 6: Modern

- 5.8.1 The earliest deposit exposed in Trench 9 comprised firm brownish grey clay, [123], at least 1.0m thick, encountered at a maximum height c. 17.15m OD. This deposit – probably re-deposited natural clay - probably represents infill material associated with the existing shuttering retaining ‘wall’ to the south of the trench. The full depth of this deposit was not established. Two timbers, including a substantial square rammed post, [125], and a horizontal timber, [124], were recorded within the clay infill, these probably derived from the railway track of the sidings which formerly occupied this part of the site.
- 5.8.2 The current surface was formed by a c. 0.30m thick layer, [127], of compacted stone, which directly overlay clay infill [123].

5.9 Trench 10 (Figure 9; Section 9, Figure 11; Plate 13)

Phase 1: Natural Sub-stratum

- 5.9.1 Natural clay, [107], comprising stiff pinkish brown clay, was exposed across the majority of Trench 10, with the exception of its north-eastern extent. The material was encountered at a depth of just c. 0.20m below the current ground level to the south-west, but fell away sharply to the north-east, where it lay at a depth of up to c. 1.70m below ground level. The maximum and minimum heights recorded on the deposit were c. 19.50m OD and c. 17.90m OD, respectively. Throughout the trench, the natural sub-stratum is considered likely to have seen horizontal truncation, probably in the late 19th or 20th century, when this part of the site was being developed for railway sidings, as depicted on Ordnance Survey mapping (for example, see Figure 11).

Phase 4: 19th-Century Industrial

- 5.9.2 Part of a substantial feature, [106], was recorded towards the north-eastern extent of Trench 10. Its function was not established, although its size suggests that it was possibly a quarry pit. Its four fills, [105]–[102], comprised various compositions of ash, clinker and clay, with a combined maximum thickness of at least c. 2.0m. These deposits probably represent infilling associated with the construction of aforementioned railway sidings.

Phase 6: Modern

- 5.9.3 The uppermost infill of feature [106] was directly overlain by c. 0.16m thick compacted stone deposit, [101], forming the existing ground surface in the area of waste ground in which Trench 10 was sited.

5.10 Trench 11 (Figure 9; Section 7, Figure 11; Plates 14 and 15)

Phase 1: Natural Sub-stratum

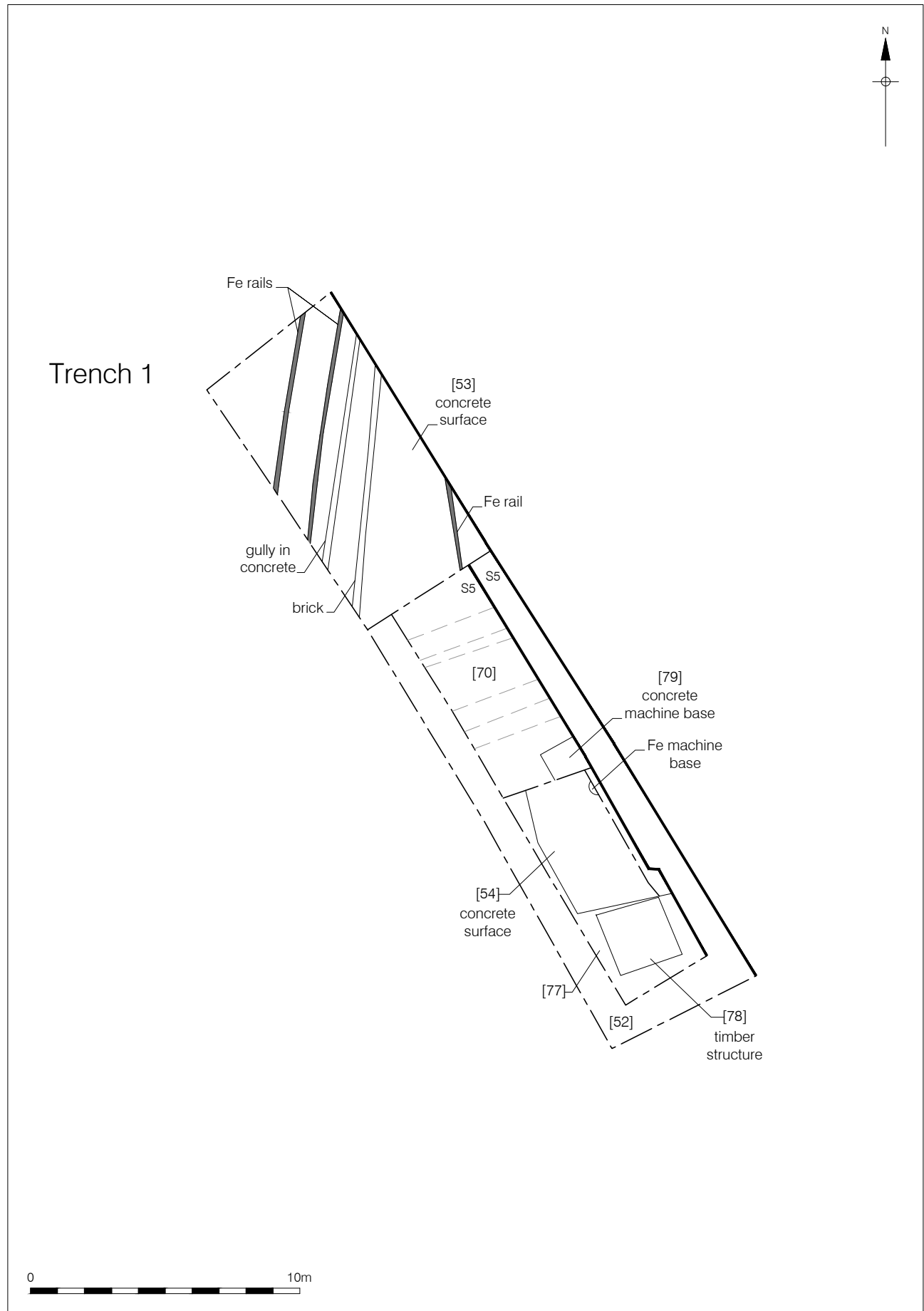
- 5.10.1 Natural clay, [121], comprising firm yellowish brown clay, was exposed across small areas towards the north-western and south-eastern ends of Trench 11. It was encountered at a depth of c. 0.30m below the current ground level, at a maximum height of c. 19.25m OD. As with Trench 10, the natural sub-stratum in this trench is likely to have seen horizontal truncation, probably in the late 19th or 20th century, when this part of the site was being developed for railway sidings, as depicted on Ordnance Survey mapping (for example, see Figure 11).

Phase 5: 20th-Century Industrial

- 5.10.2 A substantial feature, [148], was recorded cutting into the natural clay in Trench 11. This was probably aligned NE-SW and was up to c. 12.30m wide, but its full depth was not established. Its single fill, [109], comprised firm clay - probably re-deposited natural - with patches of ash and crushed coal throughout. This feature is tentatively interpreted as representing a cutting for the railway siding depicted on late 19th and early 20th century, Ordnance Survey maps, for example the edition of 1916.
- 5.10.3 To the north-west, a brick and sandstone structure, [111], within a narrow construction cut, [147], truncated the fill of the putative railway cutting. This was exposed for a distance of c. 1.25m NE-SW by c. 2.45m NW-SE and was constructed with two roughly NE-SW aligned parallel walls, c. 1.80m apart, in brick (230mm x 110mm x 80mm) with only the upper courses in header bond exposed. To the south-west of the walls was the sandstone element, a single dressed sandstone block (2500mm x 500mm) with a linear impression along its length. The impression probably indicated the location of an iron rail, suggesting that this structure was probably associated with the railway. Presumably on disuse, the structure was infilled by a silty ash deposit, [145]. Immediately to the north-west was a group, [110], of four timber sleepers which probably represent timber decking, rather than rail track.
- 5.10.4 A slag, charcoal and silt deposit, [112], measuring c. 5.0m NW-SE, extended across the width of the trench. Up to c. 0.50m thick, it directly overlay structure [111] and group of sleepers [110]. This deposit represents a later infilling/levelling of the area following disuse of structure [111].
- 5.10.5 Part of a substantial feature, [118], was recorded cutting into natural clay at the south-eastern end of the trench. It measured at least 2.20m wide and was at least 0.90m deep. Its two fills, [113] and [117], comprised various compositions of slag and gravel, with a combined maximum thickness of at least 1.20m. The function of this feature is uncertain, however it is also likely to represent a cutting for rail track depicted on Ordnance Survey maps, for example the edition of 1916.

Phase 6: Modern

- 5.10.6 A substantial service trench truncated the north-western edge of feature [118]. This feature was directly overlain by a c. 0.30m thick stone deposit [108] forming the existing surface material.



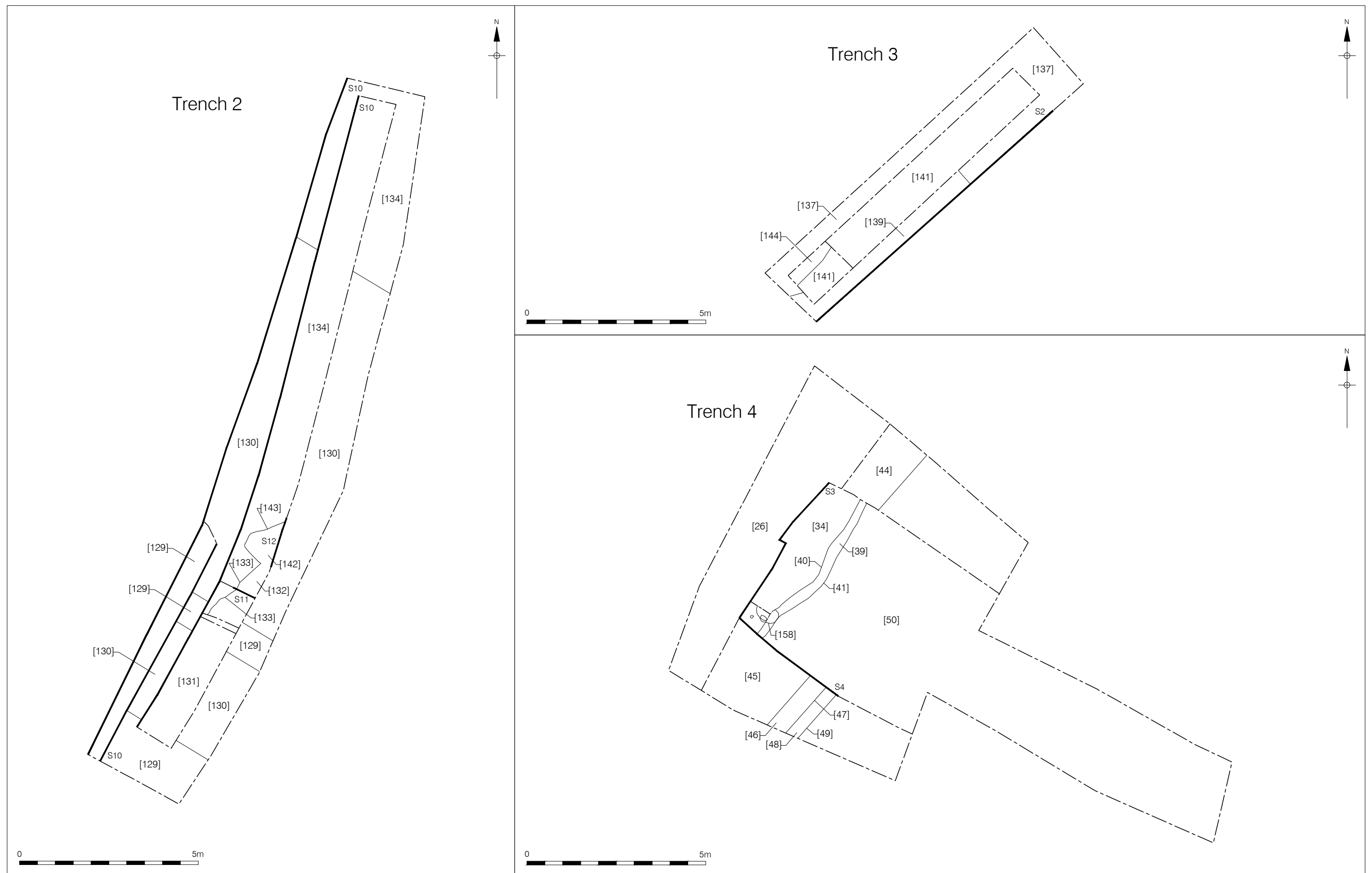
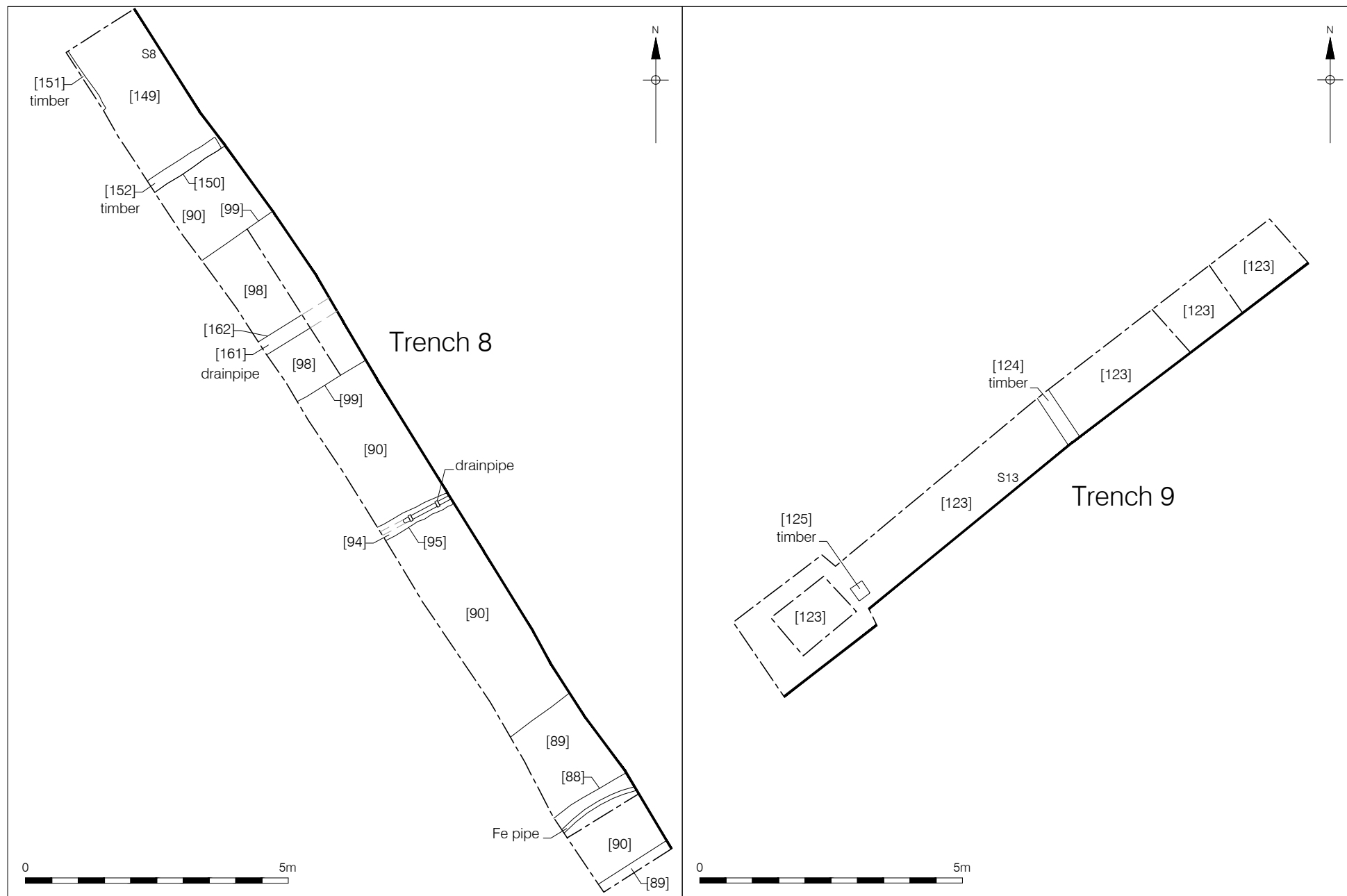
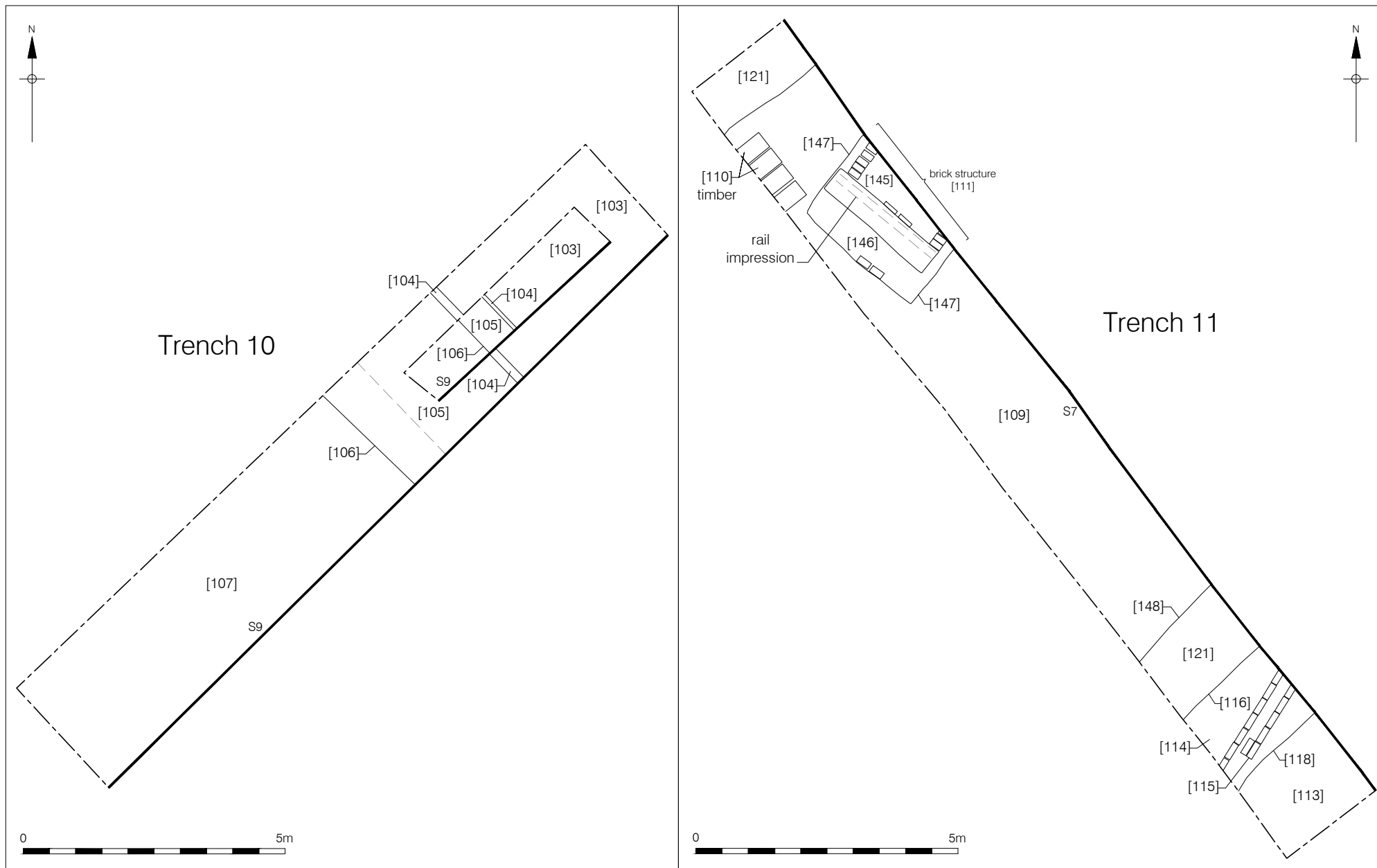


Figure 6
Plans of Trenches 2 to 4
1:100 at A3





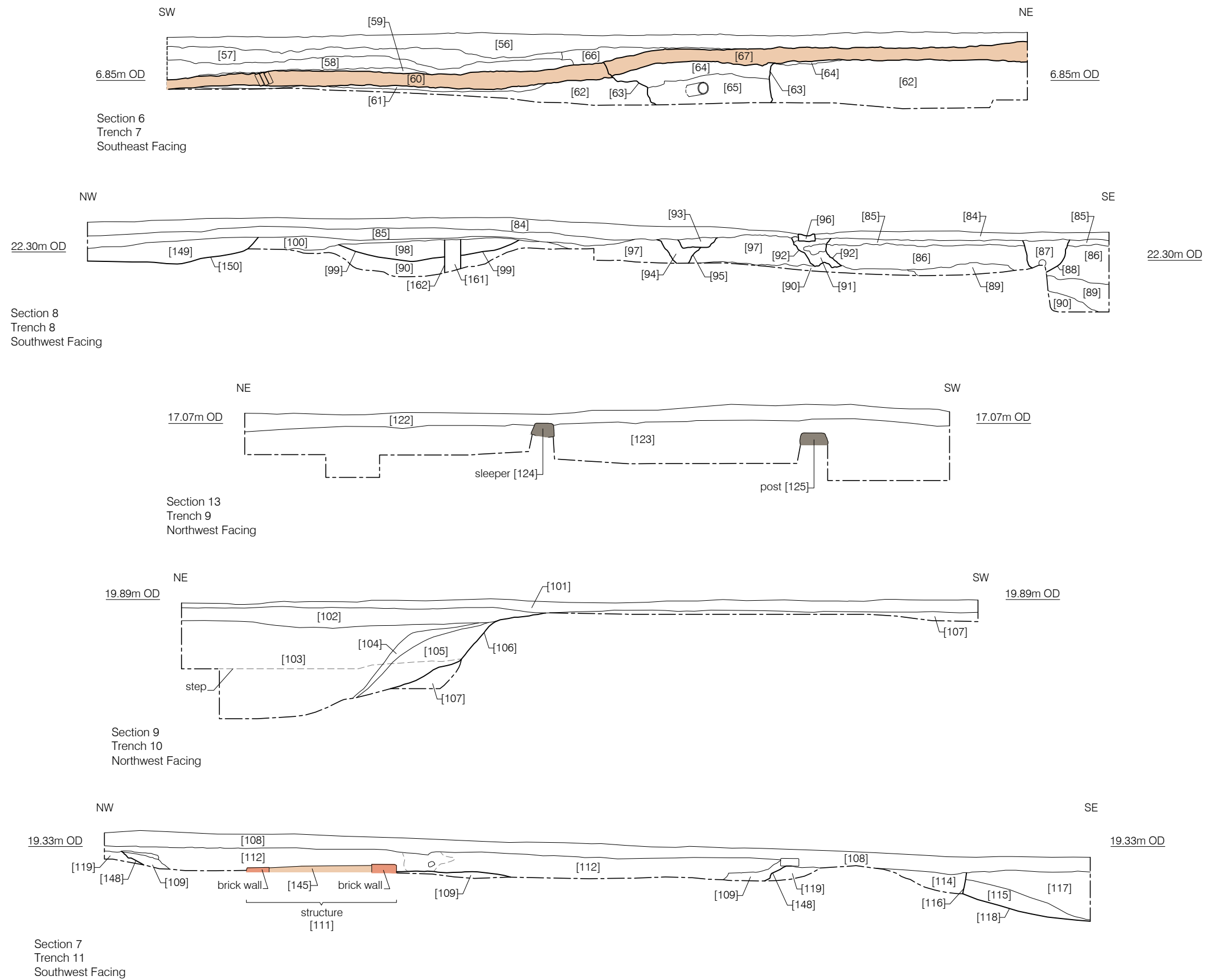


Figure 11
Sections (Trenches 7 to 11)
1:80 at A3



Plate 1: Trench 1, SW facing section (oblique), looking N (scales 2x2m & 1x1m)



Plate 2: Trench 1, SW facing section, SE end, looking NE (scales 2x2m & 1x1m)



Plate 3: Trench 2, Roman features [133] and [143], pre-excavation, looking NE (scale 1m)



Plate 4: Trench 2, central part of SE facing section (scale 1m)



Plate 5: Trench 3, SW end of NW facing section (scale 1m)



Plate 6: Trench 4, SE facing (end) section showing stratified Roman deposits (scale 1m)



Plate 7: Trench 4, NE end of NE facing section showing ditches [41] and [49] and re-cuts (scale 1m)



Plate 8: Trench 6, central part of NW facing section, showing brick structure [159] (scales 2m & 1m)



Plate 9: Trench 6, part of NW facing section, showing depth of ballast [17] (scale 2m)



Plate 10: Trench 7, central part of SE facing section (scale 2m)



Plate 11: Trench 8, part of SW facing section, showing ditch [99] (scale 1m)



Plate 12: Trench 8, part of SW facing section, showing truncated natural clay [90] (scale 1m)



Plate 13: Trench 10, part of NW facing section, showing possible quarry pit [106] (scale 1m)



Plate 14: Trench 11, northern part, showing structure [111], looking NW (scale 1m)



Plate 15: Trench 11, SE part, showing disturbed natural clay [109], looking SE (scale 1m)

6. DISCUSSION

6.1 Phased Archaeological Sequence

- 6.1.1 Geological deposits and archaeological deposits, features and structures, recorded during the evaluation have been assigned to six main phases of 'activity'.

Phase 1: Natural Sub-stratum

- 6.1.2 The natural clay sub-stratum was encountered in the majority of trenches, with the exceptions of Trenches 6 and 9. The highest recorded level on natural deposits was 22.35m OD, in Trench 10, located in the north-western part of the smaller northern portion of the site adjacent to Buddle Street. The lowest recorded level was 3.30m OD, recorded in Trench 1, located towards the western end of the main portion of the site; the deposit recorded there is considered likely to have been horizontally truncated by industrial era activity.
- 6.1.3 The current topography of the site broadly reflects the natural topography of the area, with higher ground on the valley side to the north, falling away to the riverfront to the south. However, infilling, levelling and terracing undertaken in association with the development of the site since the mid 19th century, principally as the shipyard to the south and the railway and associated infrastructure to the north, have significantly altered ground levels since the beginning of the industrial era.

Phase 2: Foreshore

- 6.1.4 The earliest deposit recorded in Trench 6 was a humic probable foreshore deposit, encountered at a height of 1.30m OD, at a depth of c. 5.70m below present ground level on the shipyard deck. A bulk sample of this deposit demonstrated that significant palaeoenvironmental remains are well-preserved at considerable depth in this part of the site. Plant macrofossils preserved by waterlogging provide information about habitats in the vicinity, with weed seeds typical of 'waste ground' identified. The presence of a few hop seeds indicated that the material possibly accumulated in the medieval period. The deposit contained fragments of wood preserved by the waterlogged conditions - this material has the potential to provide absolute dates through radiocarbon dating.
- 6.1.5 Trench 6 was sited along the postulated course of the Branch Wall but no remains of Roman date were recorded. Prior to the 19th century, the edge of the Tyne lay much further to the north than the present day, beneath the area now occupied by the former shipyard deck (Figure 3 shows the probable tidal range in the Roman period). Groyning works in the early 19th century moved the river channel to the south and mudflats that developed along the riverfront were reclaimed by deposition of substantial thicknesses of ballast to form much of the land that was subsequently occupied by the shipyard. The first edition Ordnance Survey map of c. 1860 shows that, at this date, Trench 6 was sited just below the riverfront, on the edge of an expanse of mudflats (Figure 12). The current and previous archaeological work indicates that the line of the Roman riverfront – which was probably in approximately the same position as the post-medieval riverfront prior to industrial era land reclamation - was located in the area between Trenches 6 and 7.

Phase 3: Roman

- 6.1.6 Probable Roman remains were recorded in Trenches 2, 3, 4 and 8. Trenches 2 and 3 were located close to the north-western boundary of the main portion of the site on retained, elevated ground above the Wet Dock. Two intercutting features cut into natural clay in Trench 2 may represent a wall 'robber' trench and a refuse pit. These were encountered at a depth of c. 2.20m below existing ground level, at a maximum height of c. 12.60m OD, though it is assumed that the original ground surface in this area has been horizontally truncated, leaving only the base of these features surviving. Building material recovered from the putative robber trench included a fragment of Roman *tegula* made in a fabric typical of examples found in the fort, while two sherds of second-century AD or later Roman pottery were also recovered.
- 6.1.7 In Trench 3 a substantial stone deposit was encountered at a depth of c. 1.70m below present ground level, at a maximum height of 13.02m OD. This potentially represents the road surface which led out of the south gate of the fort and ran south-westwards, possibly towards the bath-house which antiquarian reports indicate may have been located 140m south of the south-west angle of the fort. Two probable developed soils overlay the surface and the earliest of these produced a single sherd of samian pottery of second century AD or later date. A bulk sample of this deposit revealed some potential for preservation of plant macrofossils in this part of the site, and charcoal suitable for radiocarbon dating was also recovered. The bulk sample also produced material broadly indicative of domestic waste. The deposits overlying the surface, with a combined thickness of 0.70m, are likely to represent developed soils which accumulated following the abandonment of the *vicus* in the late third century AD and during the subsequent lengthy period that the site lay unused.
- 6.1.8 Trench 4, situated on a grass bank at the access to the Wet Dock, recorded deeply-stratified archaeological remains of Roman date in the extreme north-western end of the trench. Immediately to the south-east, all such strata had been truncated by construction of the Wet Dock, with only truncated natural clay exposed. The earliest features recorded were two roughly NE-SW aligned ditches and associated re-cuts, recorded at a maximum height of 7.15m OD, at a depth of c. 1.50m below present ground level. No stratigraphic relationship existed between the two ditches and they may represent a double-ditch boundary system.
- 6.1.9 Only the south side of the north-westernmost of the ditches was exposed within Trench 4; this was at least 1.70m wide and c. 0.90m deep. Projection of its profile indicates that this was probably a substantial feature in excess of 3.50m wide. Its fill yielded a pierced stone disc and a sherd of second-century AD or later flagon. The profile of the re-cut suggested that the upper portion may have been timber-lined. A sample of the humic fill of the re-cut produced a significant assemblage of palaeoenvironmental remains. Uncharred plant macrofossils, invertebrates, moss and fragments of wood were preserved by waterlogging, all in excellent condition, as were the recovered faunal remains. In general, the palaeoenvironmental remains and artefactual material in the sample are typical of domestic waste and material suitable for radiocarbon dating was abundant in this deposit. Two other linear features were recorded in section and while it was not possible to determine if these represented additional re-cuts of the original ditch, they do demonstrate that a relatively complex sequence of intercutting features survives in this part of the site.

- 6.1.10 The two roughly NE-SW aligned ditches recorded in plan and section in Trench 4 ran parallel to riverside ditch and bank defences recorded in 2001, c. 5m to the south-east of the ditches in Trench 4 (Figure 3). The substantial nature of the ditches in Trench 4 and the evidence for re-cutting, which highlights the need to maintain these boundaries, may indicate that these represent an earlier boundary along the south-eastern edge of the *vicus*, which in the third century AD was moved further to the south-east, as represented by the aforementioned defensive ditch and bank. Assessment of the humic material filling one of the re-cut ditches demonstrated that deposits of considerable palaeoenvironmental significance are present in this part of the site, at c. 1.50m, below present ground level.
- 6.1.11 In the north-western end of Trench 4, a clay levelling deposit for a stone surface directly overlay the north-westernmost ditch. Pottery was recovered from both and the latest material in the assemblage dated from the third century AD. The surface may represent a road or yard surface and indicates that, by this date, *vicus* activity extended this far to the south-east, some 80m from the south wall of the fort. The surface demonstrates that significant archaeological remains relating to occupation of the *vicus*, when it was at its most expansive and intense in the third century AD, are present in this part of the site at a relatively shallow depth, c. 1.0m, below present ground level.
- 6.1.12 A group of deposits with a combined maximum thickness of up to c. 1.0m overlay the stone surface in the north-western end of Trench 4. The uppermost was encountered at a maximum height of 8.32m OD, this immediately below the concrete road surface to the north and elsewhere below the topsoil that formed the existing ground surface. The latest material in the pottery assemblage from these deposits dates from the third century AD. The composition of the deposits indicates that they are likely to represent refuse material, presumably deposited after occupation ceased in this part of the *vicus*. The majority of the unstratified assemblage of Roman pottery, building material and animal bone recovered during machine clearance and hand cleaning of the trench are considered likely to have derived from this group of deposits. The unstratified pottery included a single sherd of fourth-century date. While occupation of the *vicus* ended by the late third century, occupation of the fort continued into the late fourth century. This later occupation is reflected by occasional late Roman material in the *vicus*. The refuse deposits in Trench 4, located c. 80m to the west of the Branch Wall, presumably form part of the extensive deposits of material, interpreted at the time as Roman midden material, noted in 1903 within the Swan Hunter site, extending westwards for some 90m from the Wall, with similar deposits noted in 1961. The relatively large quantity of unstratified material recovered during the evaluation demonstrates that deposits containing significant artefactual and ecofactual assemblages are present in this part of the site, at a relatively shallow depth below present ground level.

- 6.1.13 Trench 8, sited in the smaller northern portion of the site, adjacent to Buddle Street, recorded a roughly NE-SW aligned ditch which was evidently a substantial feature, as demonstrated by its width, although it had been subject to horizontal truncation and only the lower portion survived. It may represent a roadside ditch located along the north side of the road which ran north-eastwards from the fort. Alternatively it may represent a boundary delimiting the southern side of an area of agricultural land to the north. Excavations in 1993 undertaken a short distance to the north of Trench 8 revealed a complex of gullies interpreted as drainage channels and/or plot boundaries associated with the cultivation of the land (Griffiths 1993). The date of the pottery assemblage from those features, late second to early fourth century, indicated that the features had become disused while the fort was still occupied. Fragments of amphorae recovered from the ditch in Trench 8 were not closely datable, only broadly datable to the Roman period.

Phase 4: 19th-Century Industrial

- 6.1.14 Phase 4 represents 19th-century industrial era activity associated with the early development of the shipyard within the main portion of the site, recorded in Trenches 1, 6 and 7. On the higher ground further north, activity of the same era, as recorded in Trenches 2, 3, 8, 10 and 11, was associated with the establishment of the railway and railway sidings, the line of which is fossilised in the landscape as the Hadrian's Cycleway.
- 6.1.15 In Trenches 1 and 6, substantial deposits of sand and gravel ballast, up to 2.80m thick in Trench 1 and 4.25m thick in Trench 6, represent reclamation of the former foreshore following the narrowing of the river channel. Structures associated with late 19th-century and early 20th-century development of the shipyard, as depicted on Ordnance Survey mapping (e.g. Figures 12 and 13), were recorded in Trenches 1, 6 and 7.
- 6.1.16 Ballast deposits recorded in Trenches 2, 3 and 10 were laid down sometime after the mid 19th century, ahead of the construction of the railway and associated sidings (Figure 13). Such deposits were dumped onto the valley side in order to raise and consolidate the ground surface. In Trench 8, cuttings and rail track elements were recorded which probably represent sidings and a track associated with a goods shed first depicted on the aforementioned Ordnance Survey maps.

Phase 5: 20th-Century Industrial

- 6.1.17 This phase represents structures and deposits associated with the development of the shipyard and the adjacent railway in the 20th century. In Trench 1, concrete and timber elements of a substantial structure, probably a crane base, were recorded. In Trench 11, substantial NE-SW aligned cuttings and a brick and stone structure likely represent a railway siding depicted on Ordnance Survey mapping. A masonry structure was recorded truncating the ballast material infilling the cutting. A rail impression was observed along the length of a stone element of this structure, the function of this is uncertain.



Figure 12
Trench Locations, overlain on c.1860 First Edition Ordnance Survey map
1:4,000 at A4

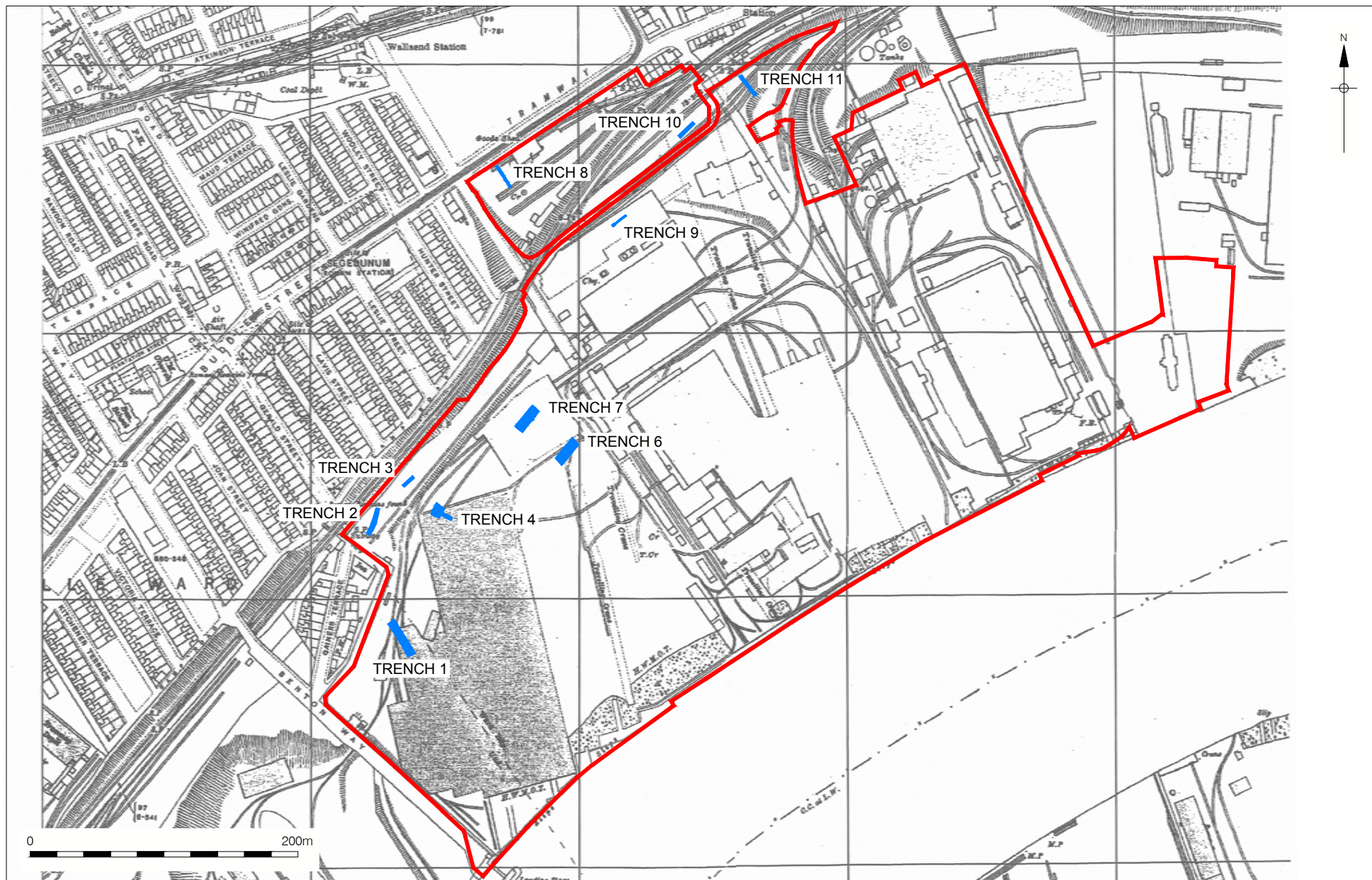


Figure 13
Trench Locations, overlain on 1916 Ordnance Survey map
1:4,000 at A4

Phase 6: Modern

- 6.1.18 Phase 6 represents modern structures deposits and features recorded across the site during the evaluation. These for the most part comprised existing surfaces, levelling/bedding deposits and services. In Trench 7, a substantial NE-SW aligned concrete duct and associated concrete surface was recorded which formed part of the internal service infrastructure of the former Swan Hunter shipyard.

6.2 The LDO Approach at the Swan Hunter Site

- 6.2.1 Perhaps inevitably, initial enquiries by potential developers for the Swan Hunter site focused on the area initially identified as being of low potential for Roman archaeological remains (Figure 3). However, now that more information is available on the nature, condition, extent and depth of archaeological remains across the site, there is increased confidence that there are no nationally important archaeology remains present even in areas initially identified as being of medium or high potential for Roman archaeological remains. This will hopefully encourage confidence and interest in developing other parts of the site where the wording of any planning conditions will ensure that archaeological remains will either be preserved *in situ* or will be excavated or recorded.
- 6.2.2 The LDO approach at the Swan Hunter site, as described above in Section 2.4, had a number of objectives and the success or otherwise of the approach should be measured against these objectives. In short, the approach sought to:
- Reduce uncertainty regarding the archaeological implications of future development.
 - Quantify the risk of developing the site so that the resource implications are clearly understood by future potential developers.
 - Ensure that important archaeological remains were appropriately dealt with.
- 6.2.3 This discussion explores how successful the Swan Hunter LDO was in meeting those objectives and whether there were unacceptable compromises in meeting them. It seeks to answer these questions:
- Is there a risk that, in the desire to create certainty of outcome (planning permission will be granted), that archaeology is less well served?
 - Is the improved certainty of planning permission bought at the expense of more uncertainty regarding the archaeological implications of development?

Reducing uncertainty

- 6.2.4 The planning process has two different types of uncertainty regarding archaeology:
- Could there be nationally important archaeological remains that will result in a refusal of planning permission?
 - Could archaeological remains on site increase the costs of development to the point that development is no longer economically viable or practical?
- 6.2.5 If uncertainty is to be successfully reduced, then both issues need to be tackled.

- 6.2.6 One of the main advantages of using the LDO process for developers is that it creates certainty of outcome in terms of planning permission, and so a conditional consent is put in place before developers invest in a site. However, having deemed consent is not enough if protracted negotiations and additional unquantified resources are required to deal with nationally important archaeological remains which have unexpectedly materialised.
- 6.2.7 Therefore, the decision to fund a first phase of evaluation, targeting areas most likely to contain significant Roman deposits, helped to create enough certainty that archaeological remains on this site were either too badly truncated to merit preservation, or too deep below the present ground surface to be affected by foundations. The developer, LPA and English Heritage can therefore be confident that the LDO process will not result in the loss of nationally important remains and developers can treat the site as relatively low risk in archaeological terms.
- 6.2.8 It is less clear what would have happened if archaeological remains had been assessed as not only nationally important, but also in areas most likely to be damaged or destroyed by new development as planning permission was already granted in principle by this stage. It would almost certainly have discouraged prospective developers from some parts of the LDO. At best, developers would have had to submit a foundation design or other proposals which would ensure protection of the archaeological remains. As the LPA was also the owner of the site, it therefore had, as a safety net, the power to refuse to sell the land if archaeological remains present were deemed to be nationally important. Any stalemate between the LPA archaeologist (and or English Heritage) and the developer would likely have placed the LPA under enormous pressure given the political will for Enterprise Zones to succeed. In a situation where English Heritage had to consider scheduling, if it met the relevant criteria, as outlined in Annexe 1 of the DCMS report on scheduling (2010), there would clearly be potential for a compensation claim against English Heritage, if scheduling subsequently prevented a development for which permission had been granted under the LDO.
- 6.2.9 There is a danger that political pressure brought to bear within a LPA means that not only is the job of evaluating the risk not properly carried out, but that once archaeological remains are excavated from the ground, there is no political will to see the results published or to condition consents for development for further archaeological work. There is no evidence that this took place at Swan Hunter and such risks are just as likely within the conventional planning process when the historic environment can sometimes, usually incorrectly, be seen as a constraint to successful economic development rather than an opportunity. However, such political pressure does no developer any favours. If the public learn that much valued archaeological remains are being destroyed through inadequate recording or publication brought about by an overzealous LPA wishing to attract investment, the outcomes can be unpredictable and can cause public relations disasters at best, and delay or abandonment of works at worst. Indeed archaeology was formalised in the planning process through PPG16 in 1990, precisely to avoid this kind of outcome (*e.g.* at the Rose Theatre in London).

Quantifying the risk

- 6.2.10 The risk of development on a site also needs to be quantified to help the developer ascertain whether the site can be developed economically. Pre-determination evaluation normally helps with that process, but at Swan Hunter the LDO process, as outlined above, is post determination. If English Heritage and the LPA had not funded this advance phase of evaluation, then the significance of archaeological remains at the site would not have been tested until after developers had expressed an interest in the site. This is far too late to discover that nationally important archaeology survives on a site and a developer might reasonably feel that they have been misled regarding the simplified planning process and reduced risks (and costs). It was therefore important that the evaluation took place at an early stage. The risk would perhaps be better quantified at an even earlier stage in the process, for example, before the LDO was designated, so that it could better inform the conditions and target them, or better still, inform the decision to create an Enterprise Zone in the first place. While no 'show stoppers' were found at Swan Hunter, they could be found in other Enterprise Zones and leaving their discovery to a later stage in the process actually increases risks for potential developers, as well as LPAs, rather than reducing them. LPAs would therefore be well advised to use their own specialist staff in identifying and assessing land being considered as an Enterprise Zone.
- 6.2.11 While English Heritage and the LPA funded the first phase of evaluation there was no funding for evaluation across the site to cover other historical periods especially the self evident industrial archaeological interest of the site. A number of (undesigned) 19th-century industrial buildings were once located on the site and these were not directly evaluated as part of his programme; however, further evaluation or recording of these will be resourced by future developers. The decision not to evaluate the site for industrial archaeology is based on the professional opinion of the County Archaeologist who, based on the information in previous desk-based research and his own expertise, is confident that archaeological remains of this era will likely not merit preservation *in situ* and can be recorded prior to their destruction by future archaeological work.
- 6.2.12 There is of course a risk that industrial era archaeological remains turn out to be more significant than anticipated, or that high quality Roman archaeological remains are preserved below industrial era remains. However, LPA archaeologists have to use their professional judgement in all planning applications and, in this instance, the presence of previous desk-based research, geotechnical site investigation data, plus an unusually high standard of HER to work with, meant that there was some confidence that archaeological evaluation of the industrial remains could be left to potential developers and that any resulting mitigation required was not likely to be too onerous.
- 6.2.13 It does, however, leave some uncertainty for potential developers, with some risk of archaeological remains being uncovered which are too expensive to excavate or preserve; this risk is, however, considered to be low, which should help to build confidence with regard to future development.

Resource implications - and who pays?

- 6.2.14 The principle of 'polluter pays' was first set out and used in international law in 1972 and was incorporated at the Earth Summit in Rio de Janeiro in 1992.⁵ Its principles in relation to the environment were encapsulated in PPG16 1990 and confirmed that archaeological mitigation should move away from local authority funded archaeology units (or no funding at all) towards developer funding of necessary archaeological works. This has been carried forward through PPS5 (2010) and the NPPF (2012).
- 6.2.15 While it is perhaps an emotive, if not unhelpful, term, the 'polluter pays' principle has continued to inform the planning process in terms of the historic environment and other aspects of development, such as ecology and landscaping, ever since. By shouldering the expense of carrying out a first phase of ground investigations and pre-determination archaeological investigation, the LPA and, in this case, English Heritage (and therefore the tax payer in both cases) incurs additional costs and removes some of the expense from potential developers (developers will still have to pay for subsequent archaeological works which can include a second phase of evaluation). The LPA saw this as an acceptable expense, because in the long term it encourages economic regeneration, which, in turn, will generate income and jobs in the area and the County Archaeologist was keen to be reassured that the site did not contain nationally important archaeological remains. However, English Heritage funding was only made available in order to test the process and would not be available to other LPAs or Enterprise Zones.
- 6.2.16 The additional costs that the LPA incurred were spread over a number of different tasks. Table 6.1 lists tasks that are carried out by the LPA in order to assess potential impact as part of the conventional NPPF process and how this differs when using the LDO procedure in the Swan Hunter Enterprise Zone.
- 6.2.17 Table 6.1 therefore indicates that a developer saved in the region of £20,000 in evaluation fees, although in this case, the site could go on to be developed by a number of smaller businesses, in which case the savings are less clear. In archaeological terms, there are some benefits to carrying out an evaluation over a wide area at the same time, rather than in a piecemeal fashion so that the results are better understood, but there is also a disadvantage that the positioning of the trenches is not informed by any proposed development, but based purely on local topography and the need to target the findings towards regional research objectives. This means that some smaller future development areas may fall between the evaluated areas.
- 6.2.18 There were fewer savings in LPA archaeologist time because of the approach in this case whereby in-house archaeological staff prefer to produce the Specification/WSI investigation themselves rather than require the developer to commission this work. Had the site been in a different LPA area, the savings to the developer would have been greater. The LPA also lost income from planning application fees from potential developers as well as from possible future failed development proposals.

⁵ The 1992 Earth Summit was officially the UN Conference on Environment and Development.

Task	Conventional NPPF procedures	Using LDO and costs to LPA	Saving to developer	Implications for archaeological protection
Heritage Statement	c. £4-5,000 each	None funded or commissioned	Paid for by previous developers	Existing DBAs were used, but no new ones commissioned
Carrying out an initial appraisal in order to identify whether there might be archaeological implications	LPA archaeologists: £30	LPA archaeologists: £30	None	Process the same. Cost assumed about 30 minutes to check HER and prepare an indicative archaeological potential map
Pre-application advice	LPAs often charge developers, but no charges are currently listed on the North Tyneside website	None required		The need for pre-app advice is unnecessary as planning permission is granted already, but developers can be given additional advice at anytime at no cost
Preparing a specification for an archaeological evaluation in order to determine the extent, nature and condition of archaeological deposits	LPA archaeologists: £400 ⁶	LPA archaeologists: £400	None	Process is the same regardless of LDO or NPPF procedure
WSI approval	Not applied in North Tyneside	None required	No saving in North Tyneside, but assume a saving of c.£ 30 in adjacent counties	None
Putting WSI out to tender to obtain costs for above and appointing a contractor	Developer (if they wish to obtain competitive costs): £200	LPA archaeologists and procurement: £200	£200	A developer might have an in house archaeologists or a preferred archaeologists so the tender process might not be necessary
Monitoring of archaeological works	LPA archaeologists make 2 visits: £100	LPA archaeologists: £100	Saving to developer is: £100	None
Paying for on site evaluation	No costs to LPA	£16-17,000, split between LPA and EH	£16-17,000	None
Paying for post excavation assessment and archiving	No costs to LPA	£3,000	£3,000	None

Table 6.1. Comparative costs between LDO and NPPF approaches to evaluation

⁶ Most LPA archaeologists prepare a short Brief and it is up to the developer to commission an independent archaeological contractor to prepare a Specification (known as a WSI) which has to be approved by the LPA. This approval is often subject to a charge. North Tyneside is unusual in that the LPA archaeologist prepares a WSI and consequently it is the LPA that resources this, regardless of whether the LDO or NPPF approach is used. In other LPAs it can safely be assumed that the preparation of a WSI is an additional task for the LPA and that the LPA will therefore go without approval charges.

- 6.2.19 However, in most respects, the planning process was similar in staff resource terms to the conventional planning process with the in-house LPA archaeological staff carrying out the normal sifting procedures, agreeing planning conditions, preparing the Specification for evaluation and carrying out quality control through site monitoring. Additional staff resources were only required to put the work out to tender and to appoint the archaeological contractor, as well as the evaluation costs. Therefore, greater certainty of outcome was bought without a significant increase in staff time, just the additional costs for the evaluation.

Was it worth it?

- 6.2.20 One of the criticisms of the first phase of Enterprise Zones from the 1980s was that each job they created was expensive with estimates ranging from £25,000 to £100,000 per job (Lee 2011). It will be some years before an assessment can be made on the success of the Swan Hunter scheme on employment, but in terms of the archaeology, the process has shielded potential future developers from some of the costs of an evaluation and bought a greater certainty of outcome.
- 6.2.21 However, permission to develop will still be based on conditions which require further archaeological work and the resources required to meet this are still unknown, not fixed and open to negotiation, because there is no agreed scheme of works. However, developers are generally less concerned with funding evaluation or mitigation once they know they have planning permission and so this process has bought their confidence by confirming that in this case the archaeology is not significant enough to prevent development.
- 6.2.22 Pre-determination evaluation is often criticised by developers as they are forced to resource it without having the certainty that they will obtain planning permission. This approach, of carrying out some evaluation prior to developer investment, removes that concern and encourages investment. Without this first phase of evaluation, there would have been too much uncertainty regarding the archaeological implications which may have discouraged prospective developers. It remains a point of concern however that this certainty is not acquired until after the Enterprise Zone and the LDO is created.
- 6.2.23 The Swan Hunter site had a number of advantages that helped to inform the evaluation process. The previous archaeological desk-based assessments (Tyne and Wear Museums 1998 and 1999) and an archaeological appraisal from 1997 (Speed 2007), including the results of some test pit monitoring, existed courtesy of some earlier development proposals and this was used to inform the evaluation process. If no such studies had existed, it may not have been so easy to relinquish to the right to refuse. Further, the HER for Tyne and Wear is of an unusually high standard, having been nurtured for many years by the previous County Archaeologist, Barbara Harbottle, and enhanced the last decade by the Tyne and Wear Archaeology Officer, Jennifer Morrison, and the current County Archaeologist, Dave Heslop, has been in post for many years and has built up detailed knowledge of the area.

- 6.2.24 Such detailed, well-researched HERs are extremely rare, so further desk-based work is nearly always necessary to quantify the archaeological potential of a site prior to assessing whether invasive work is required. For other areas, funding may therefore also be necessary for a desk-based phase of work first that provides a collation of existing knowledge about a site, map regression and aerial photography as a minimum. The fact that the site lies partially within the Buffer Zone of the Hadrian's Wall component of the WHS also brought English Heritage into the process and they were able to jointly fund the evaluation work. However, for future cases, no such funding is likely to be available.

Pros and cons of the Swan Hunter approach

Pros....

- The developer avoids the risk of investing in a development only to discover that the site has nationally important archaeology that makes it uneconomic to develop.
- The trenches can be carried out over the whole Enterprise Zone area at once which helps to understand the findings and the changing ground levels.
- The process did improve certainty and quantify the risk for the developer.
- Potential developers did save money.
- The process released about half the area with only limited archaeological conditions.
- It enhanced our knowledge of the Roman archaeology in the area.
- The additional officer time required was not significantly greater than the standard planning process (in Tyne and Wear).
- The cascading suite of conditions covered most eventualities from preservation *in situ* through foundation design down to simple watching brief.

Cons....

- The archaeological evaluation and mitigation all take place after a site has been declared an Enterprise Zone and the LDO compiled. Damage to significant heritage interests may be over ruled by politicians focusing on economic development.
- There is no right to refuse planning permission and so any conflicts have to be resolved with the development taking place.
- The first phase evaluation cannot provide absolute certainty that the site will not produce unexpected and significant archaeology and no fixed costs can be given to mitigate – there is still an element of a blank cheque being required from future developers, although the risk is low. Developers should still consider insuring against such eventualities.
- Trenches cannot be targeted towards specific development proposals in the first phase because there are none.
- A period of further evaluation is still required at developers' expense in about half the site – however these can be targeted towards areas of future disturbance.
- There is an increased cost for the LPA/English Heritage to fund the first phase evaluation
- Non-Roman archaeology was not included in the LPA/English Heritage funded evaluation and issues such as setting were not covered in the LDO.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 Archaeological Remains: Conclusions

- 7.1.1 The evaluation recorded - in Trenches 2, 3, and 4 - Roman archaeological remains, including deposits with excellent preservation of palaeoenvironmental material, relating to the potential defences, occupation, expansion and abandonment of the *Segedunum vicus*. As far as can be ascertained from the work undertaken, these remains are not of national importance. Nevertheless, they are considered to be a heritage asset of archaeological interest at a local or regional level.
- 7.1.2 The Research Agenda of *Frontiers of Knowledge* has highlighted the fact that, to date, there has been only limited investigation of extramural settlements on the Hadrian's Wall frontier which has provided relatively little information about the development and range of services within the *vici*, as well their wider economic role (Symonds and Mason 2009, 14). Chronological aspects of the Wall *vici* are poorly understood and although there is evidence for second-century AD occupation within some, including at Wallsend, it is not known how soon after the establishment of a fort that the settlements were founded. Further evidence is also needed for the date of the abandonment of the *vici*. On present evidence it seems that this had occurred by the mid to late third century AD and any later occupation has not been identified as yet. The reasons for this widespread abandonment are not known, and the factors which may have contributed to this, be they economic, military or social, are yet to be identified. The evaluation trenches at Wallsend have demonstrated that artefactual assemblages from archaeological deposits and features within the *vicus* have the potential to provide significant information about the chronology of occupation of the extramural settlement. In addition, the waterlogged deposits discovered in Trench 4 highlight the potential for obtaining absolute dates from Roman period strata through AMS dating and dendrochronology.
- 7.1.3 A variety of building types are known to have existed within the Wall *vici*, but the full range has not been determined. *Mansiones*, such as the one situated within the *vicus* attached to Benwell fort, are known and it may be that these settlements had other 'official' buildings. It is not known if there was any formal layout or zoning by function or class; varying types and standards of buildings and differences in artefactual assemblages could identify such zoning. The extent to which individual settlements were shaped by their wider context is also uncertain. At Wallsend, the topographic location, with the River Tyne forming its southern limit and the Branch Wall forming its eastern boundary, is likely to have played a significant role in the character and function of the *vicus*. Controlled archaeological excavation of larger expanses of the *Segedunum vicus* would undoubtedly provide crucial information about the layout and zoning of the settlement.

- 7.1.4 Uncertainty about the inhabitants of the Wall *vici* is known to represent a major gap in knowledge about who lived, worked in or used the extramural settlements, and any information in this regard is crucial to an understanding of the *vici*. Comparison of the material culture recovered from the forts and the *vici* is fundamental in resolving this and other gaps in knowledge. Excavations within the fort at Wallsend have produced large artefactual assemblages and the evaluation trenches located within the *vicus* in the current piece of work have demonstrated that archaeological deposits with significant artefactual and palaeoenvironmental assemblages do survive in this settlement area.
- 7.1.5 The Research Strategy of the Research Framework for Hadrian's Wall, as set out in *Frontiers of Knowledge*, states that area excavation is the only way to address many of the questions identified in the Research Agenda (Symonds and Mason 2009, 43). The evaluation trenches sited within the *vicus* area at the former Swan Hunter site, along with previous fieldwork, have demonstrated that area excavation has the potential to provide significant evidence to address the gaps in knowledge of the *vici*. The Research Strategy also states that refuse dumps are highly desirable targets for further archaeological investigation; extensive refuse deposits have been identified within the Wallsend *vicus*, during the current work (in Trench 4) and previously.
- 7.1.6 Archaeological remains of Roman date were also encountered within Trench 8, at a shallow depth below present ground level. This was located to the east of the fort and to the north of the area occupied by the *vicus*. Again, these remains are considered to be a heritage asset of archaeological interest at a local or, at best regional, level. Further exposure of the broad ditch recorded in Trench 8 would be required to clarify whether the feature represents a roadside ditch on the north side of the road leading out of the north-east gate of the fort, or perhaps the southern boundary of an area of land used for cultivation, as identified during previous investigations to the north.
- 7.1.7 No structural remains of the Branch Wall were identified within Trenches 6 and 7. The foundations of Hadrian's Wall were generally built directly on the ground or in a shallow trench on a foundation of slabs set in puddled clay (Breeze and Dobson 2000, 30; 97; Hill 2006, 95). On some excavated stretches of Wall this involved simply removing the turf and setting flagstones or large stones bedded in clay or earth (Hill 2006, 95). The Branch Wall seems to have had similarly shallow foundations; excavations close to the south-east corner of the fort revealed a clay and rubble raft supporting a mortared wall 3.10m wide (Bidwell 2009, 73). In Trench 7, the natural sub-stratum had evidently been subject to significant horizontal truncation associated with late post-medieval and/or modern landscaping for the shipyard. All traces of the Wall, including its foundations, had it been located in this area, were presumably destroyed by this activity. The ditch which ran to the east of the Wall may also have seen total removal by landscaping.

- 7.1.8 No traces of the Branch Wall were encountered in Trench 6, which was located immediately to the south-east of the riverfront as it was prior to 19th-century development of this area. The presence of a probable foreshore deposit, containing well-preserved palaeoenvironmental remains preserved by waterlogged conditions, underlying a substantial depth of late post-medieval industrial era ballast confirms that this trench was located below the 19th-century High Water Mark. Although essentially undated, the foreshore deposit produced palaeoenvironmental remains broadly suggesting that it accumulated in the medieval period; such deposits are of archaeological importance as they have potential to provide detailed information about the local environment in archaeological and historical eras.
- 7.1.9 Although no archaeological remains of Roman date were encountered in Trenches 6 and 7, the area between these trenches likely includes the line of the riverfront prior to development in the second half of the 19th century, and thus also potentially the line of the Roman riverfront. Accordingly, therefore, this area probably retains some potential for Roman remains, although as seen in Trench 7, it is possible that late 19th or 20th century landscaping has entirely removed ground surfaces of that period, with possibly only very deeply cut features surviving.
- 7.1.10 Archaeological remains recorded during the evaluation which have been attributed to 19th- and early 20th-century industrial era development are of importance only at a local level.

7.2 Lessons Learned from the LDO Approach at the Swan Hunter Site

- 7.2.1 It can be concluded that the LDO process used at the Swan Hunter site did achieve its main aim of increasing certainty regarding the risks associated with re-developing the site and the work has allowed some quantification of the risk related to further archaeological work. The cascading suite of archaeological conditions on the deemed consent of the LDO also covered most eventualities from preservation *in situ* through foundation design to archaeological monitoring (watching brief) during construction groundworks. However, at the core of the LDO process is that planning permission is deemed to have been granted, so that should there be any conflicts between development and archaeology the situation will come down to a straight fight and, it has to be said, archaeology does not always win over economic development. However, this is not particular to Enterprise Zones and LPA staff can come under political pressure to approve development without pre-determination evaluation or appropriate mitigation outside Enterprise Zones too.
- 7.2.2 The success of the process implemented at this site was partly dependent on a number of factors, which may not be applicable to other Enterprise Zones, namely:
- There was a high quality HER and the LPA archaeologist had been in post long enough to have acquired detailed specialist knowledge of the archaeological resource of the area.
 - There was an existing archaeological desk-based assessment (and a subsequent overview appraisal) which provided a map regression of the site and an assessment of the archaeological potential which, combined with existing geotechnical data and the acquired knowledge of the area, meant that the LPA archaeologist could quickly exclude some areas from being of archaeological interest, thereby freeing them for immediate development.

- The additional funding from English Heritage made the decision to partly evaluate the site more acceptable to the LPA. It might also be worth noting that the cost of archaeological investigation has generally decreased during the last few years due to the economic climate, but that the cost of such work may well increase as the economy improves.
- 7.2.3 There is a concern that the creation of an Enterprise Zone and the use of an LDO to grant planning permission can take place without adequate information on the heritage interest of a site. There may be instances in the future where funding for an historic environment desk-based assessment and any necessary evaluation should ideally be provided *in advance* where the significance of a site is unclear so that it can inform whether a site is suitable as an Enterprise Zone in the first place. An historic environment assessment can also explore issues such as setting and built character, which can then be used to inform design conditions as part of an LDO. Such issues, while identified in the NPPF, were paid scant regard to in the list of conditions in the Swan Hunter LDO and, while it is an area of great change and arguably less sensitive to further change, there may have been scope to encourage visual links between the Roman fort and the river to aid the reading of the landscape.
- 7.2.4 Agreeing to the loss of a right to refuse is inadvisable without some initial desk-based research – there is no clear funding or pathway to allow this to happen before an Enterprise Zone is declared, but funding should be sought from central government once the Enterprise Zone is established and should make provision for archaeological evaluation where necessary.
- 7.2.5 Had the first phase archaeological evaluation not taken place at the former Swan Hunter site, the risk of uncovering nationally important archaeological remains would have discouraged future development. The evaluation was able to avoid this, clear the way for a number of developments and reassure heritage bodies that nothing of that level of significance was being destroyed. However, as the evaluation was still carried out at a relatively late stage, the discovery of any nationally important remains would have been difficult and could have sparked bad publicity, legal action and the possible failure of the Enterprise Zone. Probably the best way to avoid this would be to carry out archaeological evaluation *before* the LDO is served. This approach of understanding significance (as outlined in the NPPF), before applying deemed consent should also apply to any new permitted development rights for listed buildings arising from recent changes to the Planning (Listed Building and Conservation Areas) Act 1990.
- 7.2.6 The criticism that the benefit of Enterprise Zones is short-lived (Lee 2011), is not directly relevant to archaeological remains. Once their excavation has been funded, the area is effectively sterilised of archaeological constraints and remains free for future development, even if the businesses fail. However, if foundation design and archaeological excavation areas are too targeted to specific businesses, then the process of archaeological evaluation and mitigation excavation will need to be gone through again, if the land use changes in the future.

7.2.7 Foundation or pile design should be re-usable and clearly recorded in a public archive, so that if businesses move away there is more chance of foundations, if not buildings, being re-used, thus negating the need for further archaeological evaluation and mitigation. This complements the need to encourage businesses with staying power to make the investment by local authorities worthwhile. Unfortunately, the ever tightening of building regulations would suggest that the standards for foundation design today will probably not be high enough for future foundation designs.

7.2.8 In summary, the approach taken at the Swan Hunter site worked because:

- there was a good level of in-house expertise and existing desk-based research to inform the evaluation process;
- because English Heritage defrayed some of the evaluation costs;
- because no nationally important archaeological remains were found.

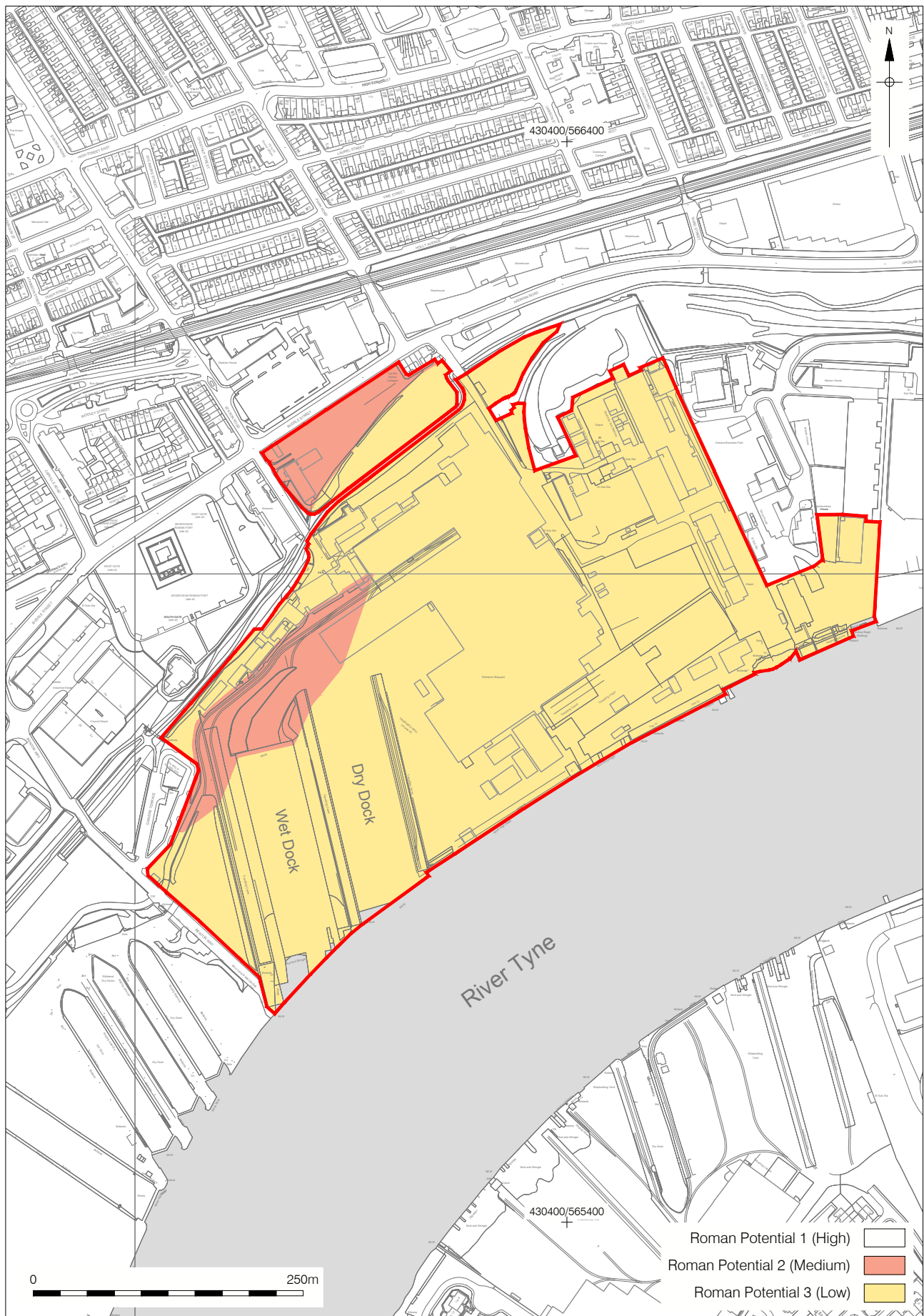
7.2.9 However, as a final conclusion, it is considered that researching the ground conditions of an Enterprise Zone after an LDO has removed the right to refuse is a high risk strategy which could, in other places, result in unnecessary conflict between developers, the LPA and heritage bodies.

7.3 Recommendations

7.3.1 The results of the archeological evaluation have facilitated revision of the archaeological sensitivity plan highlighting the potential for Roman remains. Figure 3 is the plan prior to the evaluation and Figure 14 is the amended plan, based on the results of the evaluation. The original plan and its amended version were designed by Dave Heslop, the Tyne and Wear County Archaeologist, and Mike Collins, Inspector of Ancient Monuments (Hadrian's Wall) at English Heritage. Mr. Collins has advised that the plan must not be read in isolation and has provided comments (included below) which effectively serve as an overarching set of recommendations regarding Roman period remains at the site, and which, it is stressed, should be borne in mind when reference is made to the amended archaeological sensitivity plan.

7.3.2 As concluded above, the evaluation work has clarified that, as far as can be ascertained, the archaeological remains present at the site are not of national importance. The NPPF is clear that substantial harm to such remains by development, whether designated or not, should be wholly exceptional. Therefore, the amended sensitivity map contains no areas marked as being of **high potential**.

7.3.3 However, it is advised that areas marked as being of **medium potential** should not simply be regarded as requiring mitigation by archaeological fieldwork ahead of development. Instead, it is recommended that by far the best approach to such areas is for the archaeological remains within them to be preserved *in situ*, and only when convincing arguments have been provided as to why this cannot be achieved should 'preservation by record' options, such as further archaeological fieldwork, be considered.



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Figure 14
Revised Archaeological Sensitivity (Roman Remains) Plan
1:5,000 at A4

- 7.3.4 The evaluation work has thus clarified that although preservation is not necessarily required, it should be the first option to be considered. In addition, the evaluation has demonstrated that it will be crucial to consider the effects of construction design on palaeoenvironmental remains, particularly where piled foundations are employed 'sympathetically' as the basis of preservation *in situ* of archaeological remains. Although designed to cause minimal disturbance, in terms of surface area, to archaeological deposits, piling can result in a change in groundwater level, ultimately resulting in the destruction of important palaeoenvironmental remains associated with archaeological deposits. However, in overall terms, the evaluation has demonstrated that when preservation *in situ* of archaeological remains is not possible (or where the technique proposed has the potential to destroy components of the resource, for example through dewatering as a result of piling) then it would be entirely reasonable for development to be allowed, subject to a programme of archaeological mitigation.
- 7.3.5 Once a decision is taken that further archaeological fieldwork is the correct response to a development proposal, the nature and extent of the work will still depend largely on the precise details of the construction proposed. Thus, for example, construction work that involves ground reduction to a limited depth which is unlikely to disturb important archaeological remains may be able to proceed with a minimum of further archaeological intervention. In contrast, construction work - including landscaping - which involves ground reduction to a significant depth across a wide area is likely to require full archaeological excavation in order to mitigate the impact of the development on a heritage asset of archaeological interest. Thus, when development proposals come forward, there remains the need for liaison with English Heritage and the Tyne and Wear County Archaeologist regarding precise details of the construction proposed.
- 7.3.6 For areas marked as being of **low sensitivity**, the situation effectively remains the same as it did previously: these are areas of low potential for Roman remains which are unlikely to require significant archaeological intervention. The main proviso to this is that, on parts of the site, and perhaps with specific reference to large-scale development, there may be a need for a limited amount of archaeological monitoring (watching brief) to record any potential features in areas not covered in great detail by the evaluation herein described. Again, this means that liaison with English Heritage and the Tyne and Wear County Archaeologist will be required to discuss development proposals as they come forward, specifically to establish whether monitoring is required. Notwithstanding this recommendation, it remains the case that the basic principle of development in these areas remains entirely accepted.
- 7.3.7 A specific recommendation with regard to the results of the evaluation is that, if no further archaeological investigation takes place at the site, then further analysis of some elements of the artefactual assemblage from the evaluation is undertaken and an integrated text detailing the results of the evaluation and the specialist assessments should be prepared for publication. The pottery assemblage requires a fully quantified ceramic archive catalogue which, although too small to be published, should be added to the existing catalogue of material from the riverfront area of the Segedunum *vicus*. Four or five vessels should nevertheless be illustrated for publication. The stone disc and worked antler should also be illustrated and a short report prepared.

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Sitelines (the online Tyne and Wear Historic Environment Record), at: www.twstelines.info/

UNESCO/World Heritage Convention website, at: <http://whc.unesco.org/en/list/430>

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9. ACKNOWLEDGEMENTS AND CREDITS

Acknowledgements

PCA would like to thank Capita Symonds for commissioning the archaeological evaluation herein described on behalf of North Tyneside Council, with English Heritage assisting with the funding of the archaeological work. The liaison roles of Clair Battersby (Senior Project Manager) and Jane Jackson (Senior Heritage Management Consultant) are acknowledged.

The significant project 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; the contributions of both have been essential in understanding the LDO process that was carried out at the site and their help towards the compilation of the lessons learned report is gratefully acknowledged by Caroline Hardie (see below) and PCA.

PCA Credits

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Report: Aaron Goode, Jennifer Proctor and Robin Taylor-Wilson

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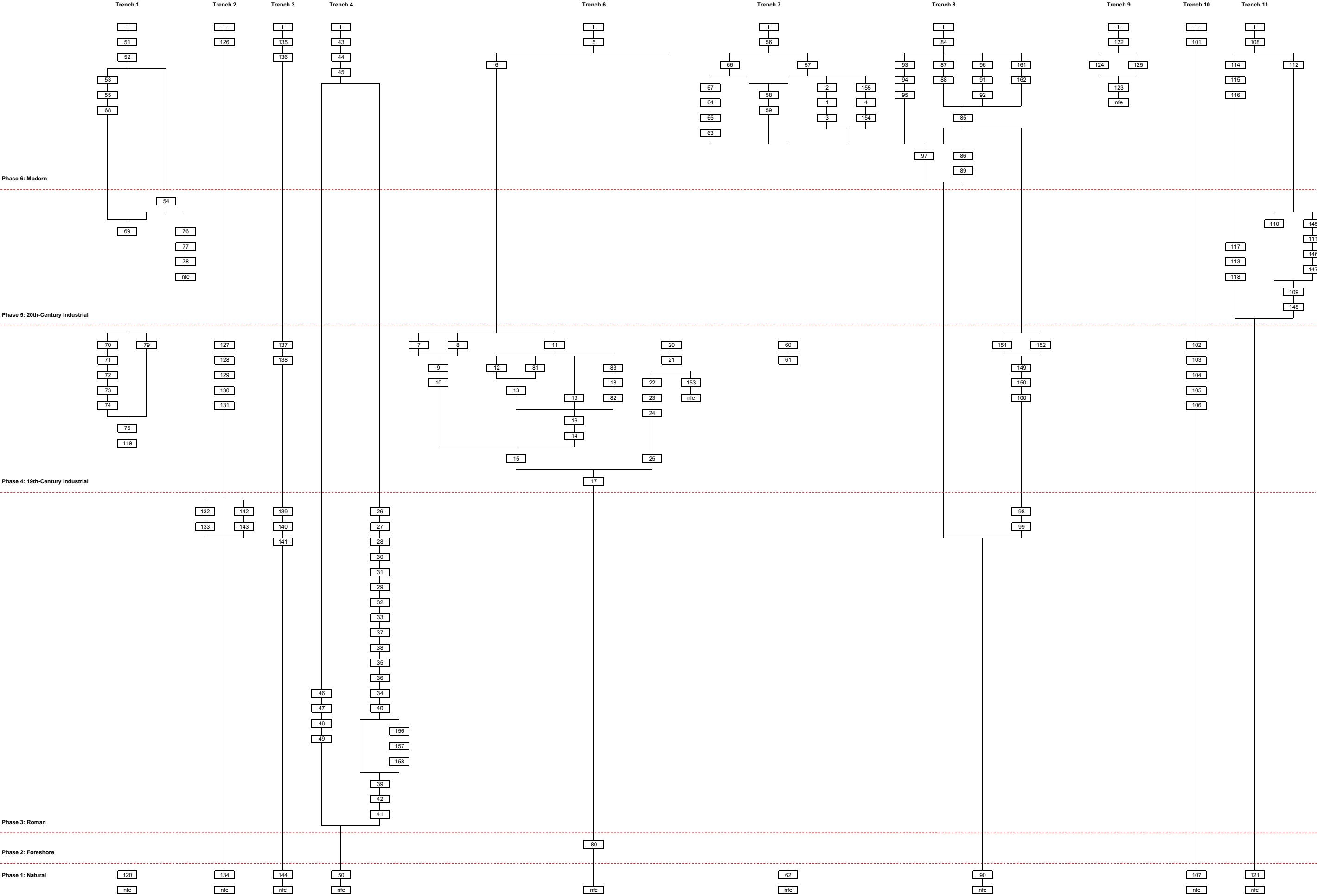
Other Credits

Lessons learned report (integrated into sections 2.4, 6.2 and 7.2 of this report): Caroline Hardie (Archaeo-Environment)

Ceramics and small finds assessment: Alex Croom

Palaeoenvironmental assessment: Archaeological Services Durham University (co-ordinated by Dr. Charlotte O'Brien)

APPENDIX 1
STRATIGRAPHIC MATRICES



APPENDIX 2

CONTEXT INDEX

SHS 13: CONTEXT INDEX

Context	Trench	Phase	Type 1	Type 2	Interpretation
1	7	6	Masonry	Structure	Concrete service duct
2	7	6	Deposit	Fill	Backfill of construction cut [3]
3	7	6	Cut	Linear	Construction cut for service duct [1]
4	7	6	Deposit	Structure	Concrete machine base
5	6	6	Deposit	Surface	Concrete surface
6	6	6	Deposit	Layer	Levelling/consolidation
7	6	4	Deposit	Fill	Backfill of construction cut for structure [9]
8	6	4	Deposit	Fill	Infill of structure [9]
9	6	4	Masonry	Structure	Brick wall
10	6	4	Deposit	Layer	Levelling/consolidation
11	6	4	Deposit	Fill	Backfill of construction cut [14]
12	6	4	Deposit	Fill	Backfill of construction cut [14]
13	6	4	Masonry	Structure	Brick wall forming part of structure [159]
14	6	4	Cut	Discrete	Construction cut filled by [11], [12], [16], [83] and structure [159] ([13], [19], [18], [81], [82])
15	6	4	Deposit	Layer	Levelling/consolidation same as [25]
16	6	4	Deposit	Structure	Concrete footing for structure [159] in construction cut
17	6	4	Deposit	Layer	Ballast
18	6	4	Masonry	Structure	Brick wall forming part of structure [159]
19	6	4	Masonry	Surface	Brick surface forming part of structure [159]
20	6	5	Deposit	Fill	Backfill of demolition cut [21]
21	4	5	Cut	Discrete	Demolition feature filled by [20]
22	4	5	Masonry	Structure	Brick wall
23	4	5	Deposit	Structure	Concrete footing for structure [22]
24	4	5	Cut	Discrete	Construction cut filled by [22] wall and [23] concrete footing
25	4	4	Deposit	Layer	Levelling/consolidation same as [15]
26	4	3	Deposit	Layer	Refuse dump
27	4	3	Deposit	Layer	Refuse dump
28	4	3	Deposit	Layer	Refuse dump
29	4	3	Deposit	Layer	Refuse dump
30	4	3	Deposit	Fill	Fill of possible gully [31]
31	4	3	Cut	Linear	Possible gully filled by [30]
32	4	3	Masonry	Surface	Stone surface
33	4	3	Deposit	Layer	Levelling/consolidation
34	4	3	Deposit	Fill	Fill of ditch re-cut [40]
35	4	3	Deposit	Fill	Fill of linear feature [36]
36	4	3	Cut	Linear	Linear feature filled by [35]
37	4	3	Deposit	Fill	Fill of linear feature [38]
38	4	3	Cut	Linear	Linear feature filled by [37]
39	4	3	Deposit	Fill	Fill of ditch [41]
40	4	3	Cut	Linear	Ditch re-cut filled by [34]
41	4	3	Cut	Linear	Ditch filled by [39], [42]
42	4	3	Deposit	Fill	Fill of ditch [41]
43	4	6	Deposit	Surface	Concrete surface
44	4	6	Deposit	Layer	Topsoil
45	4	6	Deposit	Layer	Levelling deposit
46	4	3	Deposit	Fill	Fill of ditch re-cut [49]
47	4	3	Cut	linear	Ditch re-cut filled by [46]
48	4	3	Deposit	Fill	Fill of ditch [49]
49	4	3	Cut	Linear	Ditch filled by [48]
50	4	1	Deposit	Layer	Natural clay
51	1	6	Deposit	Layer	Dump deposit
52	1	6	Deposit	Layer	Dump deposit
53	1	6	Deposit	Surface	Concrete surface
54	1	5	Deposit	Structure	Machine base
55	1	6	Deposit	Layer	Levelling/consolidation
56	7	6	Deposit	Surface	Concrete surface
57	7	6	Deposit	Layer	Levelling/consolidation
58	7	6	Deposit	Surface	Concrete surface
59	7	6	Deposit	Layer	Dump deposit
60	7	4	Masonry	Surface	Brick surface

SHS 13: CONTEXT INDEX

Context	Trench	Phase	Type 1	Type 2	Interpretation
61	7	4	Deposit	Layer	Levelling/consolidation for [60]
62	7	1	Deposit	Layer	Natural clay
63	7	6	Cut	Linear	Construction cut for drain [65]
64	7	6	Deposit	Fill	Fill of construction cut [63]
65	7	6	Other	Pipe	Concrete drain pipe in construction cut [63]
66	7	6	Deposit	Surface	Concrete surface
67	7	6	Masonry	Surface	Repair to brick surface [60]
68	1	6	Deposit	Layer	Levelling/consolidation
69	1	5	Deposit	Layer	Levelling/consolidation
70	1	4	Deposit	Layer	Ballast
71	1	4	Deposit	Layer	Ballast
72	1	4	Deposit	Layer	Ballast
73	1	4	Deposit	Layer	Ballast
74	1	4	Deposit	Layer	Ballast
75	1	4	Deposit	Layer	Ballast
76	1	5	Deposit	Layer	Backfill of structure [78]
77	1	5	Deposit	Layer	Backfill of structure [78]
78	1	5	Timber	Structure	Timber platform
79	1	4	Deposit	Structure	Machine base
80	6	2	Deposit	Layer	Humic foreshore/mudflat deposit
81	6	4	Masonry	Structure	Firebrick lining against wall [13], forming part of structure [159]
82	6	4	Masonry	Structure	Firebrick lining against wall [18], forming part of structure [159]
83	6	4	Deposit	Structure	Infill of construction cut [14]
84	8	6	Deposit	Surface	Tarmac surface
85	8	6	Deposit	Layer	Levelling/consolidation for surface [84]
86	8	6	Deposit	Layer	Levelling deposit
87	8	6	Deposit	Fill	Fill of service trench [88]
88	8	6	Cut	Linear	Modern service trench
89	8	6	Deposit	Layer	Levelling deposit
90	8	1	Deposit	Layer	Natural clay
91	8	6	Deposit	Fill	Fill of construction cut [92]
92	8	6	Cut	Linear	Construction cut filled by [91] and [96]
93	8	6	Deposit	Fill	Fill of service trench [95]
94	8	6	Deposit	Fill	Fill of service trench [95]
95	8	6	Cut	Linear	Service trench filled by [93] and [94]
96	8	6	Other	Drain	Cast concrete drain
97	8	6	Deposit	Layer	Levelling deposit
98	8	3	Deposit	Fill	Fill of ditch [100]
99	8	3	Cut	Linear	Ditch filled by [99]
100	8	4	Deposit	Layer	Ballast
101	10	6	Deposit	Layer	Levelling
102	10	4	Deposit	Fill	Fill of possible quarry feature [106]
103	10	4	Deposit	Fill	Fill of possible quarry feature [106]
104	10	4	Deposit	Fill	Fill of possible quarry feature [106]
105	10	4	Deposit	Fill	Fill of possible quarry feature [106]
106	10	4	Cut	Discrete	Possible quarry feature filled by [102]-[105]
107	10	1	Deposit	Layer	Natural clay
108	11	6	Deposit	Layer	Stone surface
109	11	5	Deposit	Fill	Fill of cutting [148]
110	11	5	Timber	Horizontal	Timber decking
111	11	5	Masonry	Structure	Possible inspection pit
112	11	6	Deposit	Layer	Levelling deposit
113	11	5	Deposit	Fill	Fill of possible cutting [118]
114	11	6	Deposit	Fill	Fill of service trench [116]
115	11	6	Other	Ceramic	Ceramic tiles in service trench [116]
116	11	6	Cut	Linear	Service trench filled by [114] and [115]
117	11	5	Deposit	Fill	Fill of possible cutting [118]
118	11	5	Cut	Linear	Possible cutting filled by [113] and [117]
119	1	4	Deposit	Layer	Levelling deposit
120	1	1	Deposit	Layer	Natural clay

SHS 13: CONTEXT INDEX

Context	Trench	Phase	Type 1	Type 2	Interpretation
121	11	1	Deposit	Layer	Natural clay
122	9	6	Deposit	Layer	Levelling deposit
123	9	6	Deposit	Layer	Backfill of shuttering retaining wall
124	9	6	Timber	Horizontal	Timber within backfill [123]
125	9	6	Timber	Upright	Rammed post
126	2	6	Deposit	Layer	Ballast
127	2	4	Deposit	Layer	Ballast
128	2	4	Deposit	Layer	Ballast
129	2	4	Deposit	Layer	Ballast
130	2	4	Deposit	Layer	Ballast
131	2	4	Deposit	Layer	Ballast
132	2	3	Deposit	Fill	Fill of linear feature [133]
133	2	3	Cut	Linear	Linear feature filled by [132]
134	2	1	Deposit	Layer	Natural clay
135	3	6	Deposit	Layer	Levelling/consolidation
136	3	6	Deposit	Layer	Levelling
137	3	4	Deposit	Layer	Ballast
138	3	4	Deposit	Layer	Ballast
139	3	3	Deposit	Layer	Developed soil
140	3	3	Deposit	Layer	Developed soil
141	3	3	Masonry	Layer	Crude stone surface
142	2	3	Deposit	Fill	Fill of possible pit [143]
143	2	3	Cut	Discrete	Possible pit filled by [142]
144	3	1	Deposit	Layer	Natural clay
145	11	5	Deposit	Fill	Backfill of structure [111]
146	11	5	Deposit	Fill	Backfill of construction cut [147] for structure [111]
147	11	5	Cut	Discrete	Construction cut for structure [111], backfill [146]
148	11	5	Cut	Linear	Cutting filled by [109]
149	8	4	Deposit	Fill	Ballast within rail track cutting [150]
150	8	4	Cut	linear	Rail track cutting filled by [149]
151	8	4	Timber	Horizontal	Rail track sleeper
152	8	4	Timber	Horizontal	Rail track sleeper, re-used as edging
153	6	4	Masonry	Structure	Brick culvert
154	7	6	Cut	Discrete	Construction cut for machine base [4] filled by [155]
155	7	6	Deposit	Fill	Backfill of machine base structure [4]
156	4	3	Deposit	Fill	Fill of posthole [158]
157	4	3	Deposit	Fill	Fill of posthole [158]
158	4	3	Cut	Discrete	Posthole filled by [156] and [157]
159	6	1	Masonry	Structure	Possible furnace formed by [13], [19], [18], [81] and [82]
160	8	6	Deposit	Fill	Fill of service trench [162]
161	8	6	Cut	Linear	Service trench filled by [161]

APPENDIX 3
POTTERY, TILE AND SMALL FINDS ASSESSMENT

POTTERY, TILE AND SMALL FINDS ASSESSMENT

By Alex Croom

Introduction

The assemblage consisted of 25 sherds of stratified Roman pottery, weighing 640g, and 76 sherds of unstratified Roman pottery, weighing 1.656kg. There were 8 sherds of post-Roman pottery (65g). The sherds are generally in a good condition.

Summary

The assemblage consisted of fabrics typical for the site. Most of the sherds are likely to be third-century in date, although there was one fourth-century sherd.

The Pottery

Samian

Most of the samian came from the unstratified layer, including a number of decorated sherds and a mortarium sherd (Dr 45). Stratified sherds include the base from a decorated bowl with a heavily worn interior and a repair slot (from levelling deposit [33]). The assemblage includes sherds of Central and Eastern Gaulish ware.

Mortaria

The three sherds come from at least two different Mancetter-Hartshill vessels

Amphorae

The three sherds are all from Dressel 20 (olive oil-carrying) vessels. There is a single rim.

Fine and coarse wares

Most of the sherds are black burnished ware fabric 2 and south-western reduced ware. There is a possible North Gaulish necked bowl of interest (from layer [28], with joining body sherds in Tr 4 US), another bowl/dish in the same fabric (Tr 4 US), and a Lower Nene Valley painted parchment ware flask (Tr 4 US). The single colour-coated ware sherd is a body sherd from a Lower Nene Valley ware flanged bowl, with a likely late fourth-century date.

Context	No.	Pottery	Date
26	4	BB2	late C2+
27	1	South-east reduced ware	C3
28	4	BB2	late C2+
32	3	BB2	late C2+
33	6	South-east reduced ware	C3
39	1	Flagon	C2+
98	2	Dressel 20 amphora	Roman
132	2	Local oxidised ware	C2+
140	1	Samian	C2+
Tr 4 US	76	BB2; Lower Nene Valley colour-coated ware coarse ware form	late C4
<i>Post-Roman Pottery</i>			
17	6	One post-medieval green-glazed sherd; five sherds C18-C19	
28	1	Unidentified oxidised ware	
34	1	Unidentified oxidised ware, probably modern	

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

The Ceramic Building Material

This consists of ten fragments of Roman tile, mainly scraps of little value, and a few pieces of modern material. The two identifiable pieces are a fragment of *tegula* roof-tile and a fragment of box-tile.

There are three fragments of burnt daub.

Context	No.	Tile	Recommendation
30	1	scrap, very fine clay	discard
119	2	Roman scraps	discard
132	1	Roman tegula edge, with flange broken away	retain
	6	Roman scraps	discard
Tr4 U/S	1	Roman box tile with comb keying	retain
	1	large irregular fragment, very fine clay	discard
	1	pan tile edge	discard
	2	scraps	discard
		burnt daub	discard
30	1	scrap, very fine clay	discard
46	1	fragment	retain
132	2	fragment	discard

Table 2: Ceramic building material

The Small Finds

Worked antler (SF1)

A piece of discarded offcut of worked antler, with both knife cuts and saw marks.

Pierced disc (SF2)

Well-worked disc in highly micaceous grey sandstone.

Discussion

The pottery assemblage is mainly third-century in date, with the only sherd likely to date after this the colour-coated flanged bowl. This is similar to other pottery recovered from the *vicus* at Wallsend, which has little material dating to after 270. Occupation of the *vicus* seems to have ended about this time, but occupation of the fort continued, which is reflected by occasional late Roman material in the *vicus*.

The tile fragments are typical of the fabric and type of tile already known from the nearby fort site. The tiles from the fort are often poorly made, and the *tegula* fragment includes large pebble fragments, characteristic of carelessly prepared clay.

Stone pierced discs are not generally very common, and this is only the second example from the site, and the first from the *vicus*. Evidence for antler-working is more common inside the fort at Wallsend than outside, probably because it is generally late-Roman in date and occupation inside the fort continued later than outside it.

Recommendations

Archive report

The stratified pottery requires a fully quantified Ceramic Archive catalogue (as defined by the *Study Group for Roman Pottery* guidelines: Darling 1999). This should comprise a detailed descriptions of the various fabric types, and their quantification by weight, sherd count and EVE (estimated vessel equivalents) as well as the dating of the individual vessels within each numbered deposit. For spot dating see Table 1. Although the assemblage is small for the quantification results to be published, the archive catalogue can be added to that existing for other pottery from the riverside area of the *vicus*.

Publication report

Although the assemblage is too small for a detailed report, little material from the *vicus* at Wallsend has been previously published. This group contains four or five vessels worthy of publication, either as a small note or as part of a larger report if further work is carried out on the site.

The tile assemblage is not worth publishing.

The small finds are both of interest and are worth illustration and a brief report.

Condition and Curation

The pottery is in a stable condition and no further conservation is required.

It is recommended that all the Roman pottery should be kept.

Table 2 lists the tile and daub fragments which can be discarded.

Bibliography

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SF1. Worked antler fragment, from fill [34] of ditch [40] in Trench 4 (scale 5cm)



SF2. Pierced stone disc, from fill [39] of ditch [41] in Trench 4 (scale 5cm)

APPENDIX 4
FAUNAL REMAINS ASSESSMENT

FAUNAL REMAINS ASSESSMENT

By Kevin Rielly

Methodology

The bone was recorded to species/taxonomic category where possible and to size class in the case of unidentifiable bones such as ribs, fragments of longbone shaft and the majority of vertebra fragments. Recording follows the established techniques whereby details of the element, species, bone portion, state of fusion, wear of the dentition, anatomical measurements and taphonomic including natural and anthropogenic modifications to the bone were registered.

Description of Faunal Assemblage

The site provided a total quantity of eleven bone fragments from stratified contexts (see Table 1), all from Roman or potential Roman deposits. Just two of these contained datable artefactual material, [27] and [33], each given a *terminus post quem* of the third century AD. In addition [34] and probably [46] (see below) are below [33] suggesting a similar or earlier date. The bones were in a very good state of preservation, no doubt related to the riverine nature of the deposits.

Context	Species	Bone	N
27	Cattle	Femur shaft	1
30	Cattle	Atlas	1
33	Cattle-size	rib	1
34	Cattle-size	rib	2
34	Cattle-size	Shaft fragment	1
34	Pig	Proximal ulna	1
34	Pig	Mandible	1
34	Sheep-size	Rib	1
37	Cattle	Proximal scapula	1
46	Cattle	Tibia shaft	1

Table 1: Species descriptions from each context where N is the number of fragments

The earliest of these deposits, [34] and [46], represent the fills of two recut NE-SW orientated ditches, with [34] overlain by [33], a clay levelling deposit, in turn below a stone surface [32]. There is then a series of possible 'midden' like deposits over this surface including [27]. Deposit [30] may well be similar in type and date to [27] while [37], a fill within linear feature [38], is also designated as Roman.

This small collection features the usual Roman domesticates, although without sheep/goat. The sheep-size rib could be identified as sheep or pig. The cattle appear to represent rather large adult animals (including the cattle-size ribs), notably with extensive butchery, while the pig mandible is from an animal aged about 2 years (using the age data given in Schmid 1972, 77), suggestive of an 'adult baconer' i.e. an animal kept and fattened until reaching maturity.

Conclusion and Recommendations for Further Work

It is obviously difficult to ascertain potential from such a small assemblage. However, the very good state of the bones clearly suggests that further excavation will undoubtedly add to this collection and that these will be of sufficient quality to identify any modifications (as butchery marks) as well as the age and size of the animals concerned. There should also be good preservation of the bones of smaller species, particularly fish, and it is highly recommended that any further excavation should include a detailed sieving programme. A final point concerns the recognition of rather large cattle amongst these few bones. It is conceivable that these may represent imports or at least the progeny of such imports, with evidence of such arrivals from the third century in Southern England corresponding to potentially similar data from the north of England (see Dobney 2001, 38–39).

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APPENDIX 5
PALAEOENVIRONMENTAL ASSESSMENT

PALAEOENVIRONMENTAL ASSESSMENT

By Archaeological Services Durham University

Introduction

This report presents the results of palaeoenvironmental assessment of three bulk samples provisionally dated to the Roman period; a humic peaty deposit [34] from ditch re-cut [40] in Trench 4, a clay soil layer [140] above a Roman road surface in Trench 3 and a possible foreshore deposit [80] from Trench 6

The objective of the scheme of works was to assess the palaeoenvironmental potential of the samples, establish the presence of suitable radiocarbon dating material, and provide the client with appropriate recommendations.

Sample processing was by Dr. Charlotte O'Brien and Lorne Elliott. Assessment and report preparation was conducted by Lorne Elliott.

Methods

All of the material from each bulk sample was processed. The bulk samples were manually floated and sieved through a 300µm mesh. The residues were examined for shells, fruitstones, nutshells, charcoal, small bones, pottery, flint, glass and industrial residues, and were scanned using a magnet for ferrous fragments. The flots were examined at up to x60 magnification for charred and waterlogged botanical remains using a Leica MZ7.5 stereomicroscope. Identification of these was undertaken by comparison with modern reference material held in the Environmental Laboratory at Archaeological Services Durham University. Plant nomenclature follows Stace (1997). Habitat classification follows Preston *et al.* (2002).

Selected charcoal and wood fragments were identified, in order to provide material suitable for radiocarbon dating. The transverse, radial and tangential sections were examined at up to x600 magnification using a Leica DMLM microscope. Identifications were assisted by the descriptions of Schweingruber (1990) and Hather (2000), and modern reference material held in the Environmental Laboratory at Archaeological Services Durham University.

The works were undertaken in accordance with the palaeoenvironmental research aims and objectives outlined in the regional archaeological research framework and resource agendas (Petts and Gerrard 2006; Hall and Huntley 2007; Huntley 2010).

Results

All of the samples contained small quantities of fragmented coal and clinker/cinder. Finds from fill [34] comprised small fragments of fired clay/CBM, pottery, calcined and unburnt bone (fish and sheep-sized noted), mussel shell and fire-cracked stones. A few indeterminate fragments of unburnt bone were recorded in deposit [140]. Apart from two cockle shells, finds were absent from deposit [80].

Charred plant macrofossils were sparse apart from a few hulled barley grains from contexts [34] and [140]. The grains from context [140] were in a poor condition due to pitting and puffing, possibly as a result of intense heat (Boardman and Jones 1990) or exposure to heat on more than one occasion. Identified uncharred plant remains from deposit [34] included taxa such as agrimony, black-bindweed, pale persicaria, hemp-nettle, buttercup, spike-rushes, ribwort plantain and sedges. Plant macrofossils preserved under waterlogged conditions were also a common feature of deposit [80] including weed seeds such as black-bindweed, fat-hen, dock and daisy family, and fruitstones of bramble and elder. A more uncommon occurrence was hop seeds. Uncharred plant remains were absent from context [140].

Fragments of charcoal were present in small quantities in deposits [34] and [140]. Identified fragments from context [34] included oak, hazel, alder, birch and blackthorn indicating the exploitation of a diverse range of taxa. Identified charcoal from context [140] largely comprised Maloideae (hawthorn, apple, whitebeams), with fragments of oak stemwood/sapwood and three-year old hazel branchwood recorded. Charcoal was absent from context [80].

Fragments of wood were a common feature in the peaty ditch deposit [34] and the humic clay deposit [80]. Many of these fragments from context [34] were roundwood (including bark). Several fragments were identified as heather twigs and three to four-year old hazel branchwood. The peat deposit comprised sphagnum moss and an uncharred hazel nutshell (half-section). These remains were in excellent condition and appear to be preserved *in situ*. Invertebrate remains were present in context [34] including fly puparia.

Vivianite, a bluish mineral sometimes encountered in archaeological deposits, was recorded in context [34]. This mineral is indicative of rotting vegetation within a sealed anaerobic environment. Typical archaeological examples of vivianite occur in association with human remains, human and animal waste deposits, industrial waste deposits and areas rich in iron (McGowan and Prangnell 2006).

Material suitable for radiocarbon dating is available for all of the deposits. The results are presented in the table below.

Discussion

The charred plant remains and finds recovered from contexts [34] and [140] are typical of domestic waste. Roman pottery of second century or later date has been recovered from these deposits. The finds provide a date, although evidence from diagnostic plant remains was absent. Ditch fill [34] produced a large flot typical of a moss peat comprising large quantities of woody material. The presence of domestic waste may relate to the original use of the ditch, with subsequent accumulation of a substantial peat deposit due to the local waterlogged conditions. The slow growth rate of peat formation may indicate deposit [34] accumulated in the ditch for a considerable period after its initial use. The partial decay of the vegetation suggests waterlogged conditions have prevailed, possibly since the construction of the ditch, and may be due to the height of the water table in the local area. Uncharred plant macrofossils recorded from context [34] are typical of damp ground, arable, open grassland and scrub.

Uncharred plant macrofossils from foreshore deposit [80] are typical of waste ground and may have been preserved as a floodplain deposit in anaerobic conditions. This included hops, which may indicate a late medieval or post-medieval origin. Hop is a scrambling perennial climber which is probably native in moist, open scrub, fen carr and hedges, although it is believed to be alien north of Yorkshire and Lancashire (Preston *et al.* 2002). It has been considered that hops were not used in flavouring beer until the 14th century. However, evidence from Anglo-Scandinavian York suggests an early medieval tradition was subsequently lost and re-established 400 years later (Hall and Huntley 2007). Hops have also been used to produce a yellow dye (*ibid.*). The low numbers of hop recorded may suggest these remains represent weeds growing on waste ground which is further supported by the presence of other species typical of this environment such as elder, bramble, daisy family and fat-hen.

The sparsity of plant remains from context [140] prevents further interpretation of this deposit.

Recommendations

Further botanical and invertebrate analysis of peat deposit [34] may be worthwhile only if a stratigraphical sequence from a core or monolith was available. This would enable radiocarbon dating of selected material and provide a chronological context for specific palaeoenvironmental information as outlined as a priority in the regional archaeological research framework and resource agendas (Petts and Gerrard 2006; Hall and Huntley 2007).

No further work is required for the plant macrofossil remains from contexts [80] and [140] as the flots were scanned in their entirety and no additional information would be provided from an analysis.

The flots should be retained as part of the physical archive of the site. The residues were discarded following examination.

The flots and finds are currently held in the Environmental Laboratory at Archaeological Services Durham University awaiting collection or return. The charred plant remains will be retained at Archaeological Services Durham University.

Sample		1	2	3
Context		[34]	[80]	[140]
Trench		4	6	3
Feature		peat infill of ditch [40]	foreshore deposit	developed soil
<i>Material available for radiocarbon dating</i>				
Volume processed (l)		9	7	5
Volume of flot (ml)		3000	1000	50
<i>Residue contents</i>				
Bone (calcined)	indet. frags	(+)	-	-
Bone (unburnt)	indet. frags	++	-	+
Bone (unburnt)	fish	+	-	-
Bone (unburnt)	sheep-size	+	-	-
Charcoal		+	-	-
Clinker / cinder		+	++	++
Coal		++	++	++
Fire-cracked stone		+	-	-
Fired clay / CBM		+	-	++
Fuel waste		+	-	-
Humified organic material	amorphous lumps	++	-	-
Marine shell	cockle	-	+	-
Marine shell	mussel	+	-	-
Pot (number of fragments)		4	-	-
Vivianite		++	-	-
Wood		-	+	-
<i>Flot matrix</i>				
Charcoal		++	+	++
Clinker / cinder		+	++	++
Coal		++	+++	++
Heather twigs (charred)		+	-	-
Heather twigs (uncharred)		+	-	-
Humified organic material		++	-	-
Insect / beetle / puparia		++	+	-
Moss		++	+	-
Rhizomes (charred)		-	-	(+)
Snail		-	+	-
Vegetative material (uncharred)		++++	+++	-
Vivianite		+	-	-
Wood		+++	+++	-
<i>Charred remains (total count)</i>				
(c) Cerealia indeterminate	grain	-	-	1
(c) <i>Hordeum</i> sp (Barley species)	hulled grain	3	-	3
<i>Waterlogged / mineralised plant remains (abundance)</i>				
Economic plants (non-cereal)	hops	-	2	-
Fruitstones		-	2	-
Nutshell fragments		2	-	-
Weeds		5	3	-

[c-cultivated. (+): trace; +: rare; ++: occasional; +++: common; ++++: abundant
Waterlogged remains are scored from 1-5 where 1: 1-2; 2: 3-10; 3: 11-40; 4: 41-200; 5: >200]

Table 1: Data from palaeoenvironmental assessment

Sources

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APPENDIX 6
BRIEF (AND SPECIFICATION) FOR THE EVALUATION

Swan Hunter Redevelopment

Brief for Archaeological Evaluation
of Former Swan Hunter Site,
Wallsend, North Tyneside

18 June 2013



Quality Management

Job No	CS/063633	Doc No.	
Project	Swan Hunter Redevelopment – Brief for Archaeological Evaluation		
Location	North Tyneside		
Document Ref	CS/063633		
File reference			
Date	18 June 2013		
Prepared by	Jane Jackson	Signature (for file)	
Checked by	Clair Battersby	Signature (for file)	
Authorised by	Ian Roberts	Signature (for file)	

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Appendix E Extent of LDO Boundary with Numbered Trenches	
Appendix F Extent of Roman Archaeology	

1.0 Scope of Services/Works

- 1.1 Capita Symonds acting on behalf of North Tyneside Council, assisted by English Heritage and the Tyne and Wear Specialist Conservation Team, are seeking tenders to carry out a programme of archaeological evaluation on the former Swan Hunter shipyard site. The scope of this programme is detailed in this document.
- 1.2 The purpose of this work is to refine the current understanding of the location, depth, extent and significance of archaeological deposits within the site, to inform both the future redevelopment of the site, and also to reflect on approaches to addressing archaeological issues within Enterprise Zones. It is expected that the successful tenderers will evidence clear understanding of both of these aspects, as well as the archaeological and planning background to the site.
- 1.3 The full specification can be found at appendix A.

1.3 Required Works

- 1.3.1 The successful tenderer will undertake the following works:
- The archaeological evaluation work detailed in the specification attached at appendix A;
 - Provide an interim report on the results of the evaluation work, including recommendations for further archaeological works;
 - Provide a full report on this work, including final recommendations for further archaeological work. These recommendations will be expected to discuss a draft of these with Capita Symonds, the Council, the Tyne and Wear Specialist Conservation Team and English Heritage prior to the submission of the final report and to take account of comments made. Part of this report should include a revised version of the attached plan of archaeological sensitivity (appendix B);
 - Provide a report, reflecting lessons learned on the issue of archaeological remains in Enterprise Zones, together with recommendations for how archaeological issues could be approached in other Enterprise Zones to enable sustainable growth. This may be included within the main evaluation report, but must be considered to be an integral part of this specification.

2.0 Background Information

2.1 Location

- 2.1.1 The site is located on the North Bank of the River Tyne at Wallsend, within North Tyneside Council. The site is now largely vacant following the closure of the Swan Hunter site yard in 2007 and is owned by North Tyneside Council.
- 2.1.2 The main development site is on two distinct levels, created by infill and embankments. The remaining ship yard offices are sited on the upper terrace to the north of the site and the ground falls away to the Tyne. This ground was built up in the past and the fill varies from 5 metres to 10 metres above natural ground levels across the site from north to south (based on past bore hole information)(Appendix C) . Most of the construction sheds and infrastructure associated with ship

building has been removed prior to North Tyneside Councils ownership although a retaining wall remains from a partially demolished building, running along the western side of the eastern access road.

2.2 Nature of the Site

- 2.2.1 Since the Roman period the site has been heavily developed, particularly during its use as the Swan Hunter shipyard. This has led to very significant changes to the ground level within the site, leaving some areas of the site with a reduced archaeological potential, and others where it is anticipated that surviving archaeological remains will be located at some depth. Much of the site is also currently covered by concrete surfaces, including the evaluation trench locations.
- 2.2.2 This context has been taken fully into account in the development of this specification. However, tenderers must be fully aware that to fulfil this specification this will require:
- The breaking out and removal of concrete surfaces;
 - A potential need to excavate at depths below the current ground surface, requiring either the use of shoring, or stepping/broadening of trenches to allow safe excavation.
- 2.2.3 Within their submissions tenders must evidence understanding of this context, showing how they intend to address these needs. In order to inform their approach, and their tender costing, those invited to tender will be provided with electronic copies of reports on previous archaeological works around the site, and these are listed under appendix D. In addition, Capita Symonds have also carried out a programme of ground investigation for engineering purposes, which has allowed an estimation of the depth of made ground. Although this work was not undertaken for archaeological purposes, and is ongoing, an interim plan, showing the likely depth of made ground within the site is included in this specification as appendix C.
- 2.2.4 The final report on this geotechnical investigation of the site will be completed after the initial archaeological fieldwork, and provided to the successful tenderer. They will be expected to examine this report, and use it in formulating their final recommendations for further archaeological works.
- 2.2.5 The successful tender will be expected to fulfil this specification, regardless of the depth of surviving archaeological remains, without alteration to the tender price.

2.3 Planning Background

- 2.3.1 The majority of the former Swan Hunter site has been designated as an Enterprise Zone. Enterprise Zones have been developed by the government to aid regeneration and development in the current economic context, and provides for financial assistance and a simplified spatial planning process.
- 2.3.2 This latter aspect is of particular importance, as it extends permitted development within the Zone, so that a range of development that would normally require planning permission can be undertaken without further applications.
- 2.3.3 On the Swan Hunter site, North Tyneside Council have developed a Local Development Order (LDO), to fulfil this simplified planning system, but also to deal appropriately with the potential on the site for Roman archaeological remains associated with the Hadrian's Wall Roman frontier.

Appendix E illustrates the LDO boundary with the numbered trenches and Appendix F illustrates the potential for roman archaeology.

- 2.3.4 As part of this LDO, a condition has been attached to the permitted development requiring a phased approach to the archaeological potential of the site. The first phase of this a programme of archaeological field evaluation, to allow better understanding of the archaeology on the site. This would then allow a judgement to be taken as to the priority that should be given to the preservation in-situ of archaeological remains, and where such preservation is not considered mandatory, what archaeological mitigation fieldwork would be appropriate.
- 2.3.5 The concept of Enterprise Zones is to aid regeneration, and information which can reduce risk and bring greater certainty will be beneficial. While any developer will have to comply with archaeological conditions on the LDO, given the potential archaeological significance of the site in relation to the Hadrian's Wall World Heritage Site, North Tyneside Council is keen to enable developers to make informed assessments of archaeological issues (and hence design/layout of the site) by providing a more detailed archaeological sensitivity map.
- 2.3.6 In the first phase of Enterprise Zones, the Swan Hunter site is the only one thought likely to have archaeological implications involving nationally (and, potentially, internationally) significant remains. It is therefore proposed to use the Swan Hunter site as a pilot scheme to explore ways of operating Enterprise Zones where they are necessarily located in areas of significant archaeological potential. This has led to the current programme of evaluation work, to be funded by North Tyneside Council, with assistance from English Heritage. This programme requires both field evaluation work, and also reflection on the evaluation process, to highlight the positive and negative aspects of dealing with archaeological potential in Enterprise Zones, and the lessons learnt from the methodology used in this particular case.

3.0 Programme

- 3.1 The following programme indicates key milestones for this project.

Task	Date
Release of Tender	18 June 2013
Opportunity for site visit – between 11.00am and 2.00pm	19 and 26 June 2013
Submission of Tender	28 June 2013
Evaluation and selection of tenderer	5 July 2013
Inception Meeting	10 July 2013
Completion of interim report	28 August 2013
Completion of report dealing with lessons learned about archaeology and Enterprise Zones	14 September 2013
Acceptance by commissioning body of final report	14 February 2014

- 3.2 Opportunity for site visits must be arranged with Clair Battersby prior to visit.

- 3.3 These programme dates must be regarded as the final dates for submission of each piece of work, and every effort should be made, particularly with regard to the final report, to fulfil these at the earliest possible date. A 10% retention will be kept in hand after the fieldwork, to be released on acceptance of the final report.

4.0 Contract Arrangements

- 4.1 This commission will be contracted under NEC 3 Engineering and Construction Sub-Contract.

5.0 Tender Submission

- 5.1 **Tender submission date is 28 June 2013, at 12 noon.**
- 5.2 Tenders should be emailed to Clair Battersby at Clair.battersby@capita.co.uk by this deadline. Any tenders received after this date will not be accepted.
- 5.3 Tenders are invited to carry out the works detailed in this specification document. These will be evaluated on methodology of approach, experience and price by the commissioning body.
- 5.4 Although the commissioning body does not require a separate project design from the tenderers, it is expected that the submitted tender will evidence understanding of the site and its archaeology (including its archaeological research potential), the planning context of the work, the specific required products, and the logistical issues connected with working on the site.
- 5.5 Tenders for the work should contain the following:-
- **Methodology** - provide a detailed methodology demonstrating an understanding of the project and the approach to be used to undertake the work;
 - **Experience** - Provide details of the staff employed and their relevant experience and any sub-contractors employed;
 - **Price** - A quotation of cost, broken down into the following categories:-
 - Costs for the excavation, incl. sub-headings of staff costs on a person-day basis, transport, materials, and plant etc;
 - The costs must include separate figures for both the immediate backfilling of the trenches, and also to return and backfill the trenches up to one month after completion of the work (to allow for a potential need for geotechnical investigations within the trenches);
 - Post-excavation costs, incl. storage materials;
 - Cost of Environmental analysis and scientific dating per sample;

- Estimated cost for full publication of results in an archaeological journal;
- Overheads.

5.6 Tenderers must note the timescale for the commission and must state in submissions that they can meet this timescales or provide any explanation for an alternative programme,

Outputs

5.7 It will be expected that the successful contractor will produce:

- An interim report and recommendations within two weeks of the completion of the fieldwork;
- The report dealing with lessons learned for future archaeological works in Enterprise Zones within 1 month of the end of the fieldwork;
- The final report on the fieldwork, including completion of post-excavation analysis, within 6 months of the completion of fieldwork.

6.0 Tender Evaluation

6.1 Tenders will be evaluated based on the following:

- Methodology – 30%
- Experience – 30%
- Price – 40%

6.2 Capita Symonds does not does not undertake to accept the lowest of any tender and reserves the right to accept the whole or any part of any tender submitted. Each tender will be checked for compliance with all tender requirements. During the evaluation period, Capita Symonds reserves the right to seek clarification in any form to assist in its consideration of their tenders.

7.0 Contact Details

7.1 All queries in connection with this tender should be made to:

- Clair Battersby, Capita Symonds – clair.battersby@capita.co.uk – for general queries;
- Jane Jackson, Capita Symonds – jane.jackson@capita.co.uk – for archaeological specific queries

Appendix A

Tyne and Wear Specialist Conservation Team **Specification for Archaeological Evaluation on the site of the Former Shipyard at Swan Hunters, Wallsend, North Tyneside**

Author:

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Date: 11/04/2013

Our ref: MON9517EVA

The Tyne and Wear Specialist Conservation Team is the curatorial service for archaeology, industrial archaeology and historic buildings throughout the Tyne and Wear districts. It helps and advises Newcastle, Gateshead, North Tyneside, South Tyneside and Sunderland Councils to carry out their statutory duties to care for the precious historic environment of Tyneside and Wearside. The Team can be found at the Strategic Housing, Planning and Transportation Division of the Environment & Regeneration Directorate of

Introduction

The re-development of the former Swan Hunters shipyard and several adjoining properties is a major regeneration objective of North Tyneside MBC. Parts of the estate are of the highest sensitivity.

Research Aims and Objectives

The tender and evaluation report should make reference to Regional and Thematic Research Frameworks:

- *Frontiers of Knowledge: A Research Framework for Hadrian's Wall, part of the Frontiers of the Roman Empire World Heritage Site* (Symonds and Mason 2008) is the primary document that sets out the research priorities of Hadrian's Wall:

<http://www.dur.ac.uk/archaeology/research/projects/?mode=project&id=485>

- *Shared Visions: The North-East Regional Research Framework for the Historic Environment* (NERRF) (Petts and Gerrard 2006) notes the importance of research as a vital element of development-led archaeological work. It sets out key research priorities for all periods of the past allowing commercial contractors to demonstrate how their fieldwork relates to wider regional and national priorities for the study of archaeology and the historic environment. The aim of NERRF is to ensure that all fieldwork is carried out in a secure research context and that commercial contractors ensure that their investigations ask the right questions:

<http://content.durham.gov.uk/PDFRepository/NERFFBook2.pdf>

The relevant key NERRF research theme for this project is **Riii** (Petts and Gerrard 2006, 148).

Ideally and where possible the evaluation should cross-reference its aims and objectives to national priorities, defined in English Heritage's SHAPE (Strategic Frameworks for Historic Environment Activities and Programmes).

Where appropriate note any similar nationwide projects by use of the websites of the Archaeology Data Service (ADS), Aggregates Levy Sustainability Fund (ALSF), National Heritage Protection Plan (NHPP), Online Access to the Index of Archaeological Investigations (OASIS), National Monument Record (NMR) and any other internet search engines.

All staff on site must understand the project aims and methodologies.

Methods Statement

Evaluation trenches are needed to inform the Local Planning Authority (LPA) of the character, nature, date, depth, degree of survival of archaeological deposits on this site. The excavation must be carried out by a suitably qualified and experienced archaeological organisation. The work will record and environmentally sample any archaeological deposits of importance found on the plot. The purpose of this brief is to obtain tenders for this work. The report must be the definitive record for deposition in the Tyne and Wear Historic Environment Record (HER), and it must contain recommendations for any further archaeological work needed on this site, together with wider recommendations for approaches in other Enterprise Zones with archaeological potential (see introductory section for clarification of report objectives).

All staff employed by the Archaeological Contractor shall be professional field archaeologists with appropriate skills and experience to undertake work to the highest professional standards.

The work will be undertaken according to English Heritage guidelines:

- *Managing Archaeological Projects 2nd Edition* (MAP2) (1991):
www.english-h.gov.uk/guidance/map2/index.htm
- *Management of Research Projects in the Historic Environment* (MoRPHE) –*The MoRPHE Project Managers' Guide, Project Planning Notes and Technical Guides* (all 2006):
www.english-heritage.org.uk/publications

The work will be undertaken according to *MoRPHE Project Planning Notes*: 'PPN3 – Archaeological Excavation' and 'PPN6 – Development of Procedural standards and guidelines for the historic environment'.

All work must be carried out in compliance with the codes of practice of the Institute for Archaeologists (IfA) and must follow the IfA's standard and guidance documents for field evaluation, excavation or archaeological watching Brief, as appropriate:

www.archaeologists.net

Notification

The County Archaeologist (CA) needs to know when archaeological fieldwork is taking place in Tyne and Wear so that he can inform the LPA and can visit the site to monitor the work in progress. The Archaeological Contractor must therefore inform the CA of the start and end dates of the evaluation. He must also keep the CA informed as to progress on the site. The CA must be informed of the degree of archaeological survival and of any significant finds. The Client will give the CA reasonable access to the development to undertake monitoring.

PROJECT INITIATION

PROJECT DESIGN

Because this is a detailed specification, the CA does **not** require a Project Design from the appointed archaeologist. The appointed archaeologist is expected to comply with the requirements of this specification.

HEALTH AND SAFETY AND RISK ASSESSMENT

A Health and Safety statement and Risk Assessment, identifying potential risks in a Risk Log (see template in Appendix 2 of the *MoRPHE Project Manager's Guide*) and specifying suitable countermeasures and contingencies, is required to be submitted to the commissioning Client.

The Client may wish to see copies of the Archaeological Contractor's Health and Safety Policies.

The Archaeological Contractor must maintain a Site Diary for the benefit of the Client, detailing the nature of work undertaken on a day by day basis, with full details of site staff present, duration of time on site, etc. and contact with third parties.

The *MoRPHE Project Managers' Guide* contains general guidance on Risk Management (section 2.3.2, Appendix 2).

Risk Assessments must be produced in line with legislative requirements (for example the *Health and Safety at Work Act 1974*, the *Management of Health and Safety at Work Regulations 1999*, the *Control of Substances Hazardous to Health (COSHH) Regulations 2002* and the *Personal Protective Equipment at Work Regulations 2002*) and best practice e.g. as set out in the FAME (Federation of Archaeological Managers and Employers) formerly SCAUM (Standing Conference on Archaeological Unit Managers) Health and Safety Manual:

www.famearchaeology.co.uk; www.scaum.org.uk

The Risk Assessment will identify what PPE (hard hats, glasses/goggles, steel toe cap and instep boots, gloves, high-visibility clothing, etc.) is required.

Other potentially applicable legislation and guidance: *Workplace Safety and Health (Work-at-Heights) Regulations 2013*; *Manual Handling Operations Regulations 1992 (as amended)*; *Safe use of ladders and stepladders: An employers' guide* (Health and Safety Executive (HSE), 2005).

Some archaeological work (such as those that last more than 30 days or involve more than 500 person days) may be deemed notifiable projects under the *Construction (Design and Management) Regulations 2007*. Where CDM regulations apply, the HSE must be notified. A CDM co-ordinator (CDM-C) and principal contractor (PC) must be appointed. The CDM co-ordinator will produce a Health and Safety file. The PC will prepare the Construction Phase Plan.

Detailed information on hazards and how to carry out a Risk Assessment can be obtained from the HSE (www.hse.gov.uk) and LPA Health and Safety representatives.

Specific guidance for land contamination and archaeology can be obtained from the IfA (www.archaeologists.net), the Construction Industry Research and Information Association (www.contaminated-land.org) and the Association of Geotechnical and Geoenvironmental Specialists (www.ag.s.org.uk). See also *Guidance on Assessing the Risk Posed by Land Contamination and its Remediation on Archaeological Resource Management* (Environment Agency 2005).

The Archaeological Contractor must be able to provide written proof that the necessary levels of insurance cover are in place.

The Archaeological Contractor must detail measures taken to ensure the safe conduct of excavations, and must consult with the Client concerning working in close proximity to the foundations of the surrounding buildings and ground conditions across the site.

Excavation trenches should:

- be protected from vehicles and guarded off for pedestrians;
- not have steep sides or must be shored;
- have good access and egress.

The archaeologists must not work near overhead power lines.

Underground services can be easily damaged during excavation work. If proper precautions are not taken, it is all too easy for workers to hit these services resulting in a risk of:

- heat, flame and molten metal from electric cables;
- escaping gas from gas pipes;
- flooding of the excavation when a water pipe is damaged;
- interruption of services.

Excavation work in the public highway, kerbside or pavement can only be undertaken by those with a Street Works certificate of competence. Before the excavation takes place the person supervising must have been given service plans and be trained in how to read them. All persons involved in the excavation must know about safe digging practice and emergency procedures. A locator must be used to trace the line of any pipe or cable or to confirm that there are no pipes or cables in the way. The ground will be marked accordingly. There must be an emergency plan to deal with damage to cables and pipes.

PROJECT EXECUTION

1) Archaeological evaluation

The location of the trenches is shown on the accompanying plan. All trenches need to be of sufficient depth to establish either the presence of natural sub-soil or the presence of Hadrian's Wall and related Roman archaeological remains. Masonry or rubble core which may represent the remains of Hadrian's Wall or any structures likely to be of similar significance must be left in situ. Should any of the trenches encounter only deep features of recent date evaluation can cease following discussion with the commissioning agent, English Heritage and the CA. Archaeological features which cut subsoil need to be excavated within the trenches to undisturbed natural subsoil. The individual trenches are machine-cut sondages, 2m wide and of varying length. Trenches can be widened if feasible in order to step the sides to reach depths over 1.2m, if necessary, otherwise shoring will be required.

Trench positions should be accurately surveyed prior to excavation and tied in to the national grid.

Trench 1: 2 x 30m. On the western edge of the site, the trench should ascertain the position of the original river edge, and the presence/absence of river-side features. Modern dumped overburden, shown on the Google aerial view, may need to be machined away before excavation can commence.

Trench 2: 2 x 20m. This trench evaluates the area to the east of the bath-house where well-preserved structural remains have been recorded over a long period.

Trench 3: 2 x 10m. Located on the line of the fort south road, T3 investigates the degree of survival beneath later buildings on the terrace to the south of the Hadrian Cyclepath.

Trenches 4 & 5: 2 x 15m. These trenches are those closest to the riverside structures recorded in 2002. They are located in gaps between the concrete roadways and the dry-dock crane raildecks.

Trenches 6 & 7: 2 x 15m. Both positioned on the presumed line of the branch wall in to the north of the area where the ground will have been disturbed by the deep cuttings for the crane rails.

Trench 8: 2 x 2m: Close to the excavations of 1997 (TWM unpublished) on the probable alignment of the eastern road, and adjacent to the excavations in the supermarket car-park which revealed evidence of agriculture to the north-east of the fort.

Trench 9: 2 x 15m: To test the effect of terracing on possible archaeological features in the area to the east of the retained buildings.

Trenches 10 & 11: 2 x 20m: Located on the edge of anticipated archaeological activity, they may help define the eastern edge of the Roman remains and agriculture.

Tasks

An experienced archaeologist is required to analyse the ground investigation reports for the site in order to achieve the best possible understanding of the site stratigraphy before trenching commences. One day should be allowed for this task in the price quotation.

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 0.5m in diameter can be half sectioned.

Environmental sampling (and where relevant scientific dating) are compulsory parts of the evaluation exercise. All tenders will give a price for the assessment, full analysis, report production and publication per environmental and scientific dating sample as a contingency.

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 MAP2/MoRPHE 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 400 387) before the evaluation begins. See Appendix 1 of this Specification for more information.

See Appendix 2 for guidance on procedures relating to human remains.

See Appendix 4 for guidance on *Treasure Act* procedures.

The spoil can be kept close-by and rapidly backfilled into the trenches at the conclusion of this work.

Recording

A full written, drawn (accurate scale plans, elevations and section drawings) and photographic record (of all contexts in either black and white print and colour transparency or with a digital camera) will be made. All images must include a clearly visible graduated metric scale.

All photographs forming part of the record should be in sharp focus, with an appropriate depth of field. They should be adequately exposed in good natural light or, where necessary, sufficiently well-lit by artificial means.

Use of digital cameras

Use a camera of 5 megapixels or more.

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 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.

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 and 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
- 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:

<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 – if any white balance adjustments such as 'daylight' or 'shade' is 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 14 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 'JPEG-ing'.

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:

Digital Imaging Guidelines (Leonard (Digital Archive Officer), English Heritage 2005); *Understanding Historic Buildings – A guide to good recording practice* (English Heritage 2006); *Archaeological Archives – A guide to best practice in creation, compilation, transfer and curation* (Brown, 2007); *Guidance on the use and preservation of digital photographs* (IfA); *A Six Step Guide to Digital Preservation*, Forum on Information Standards in Heritage (FISH) Fact Sheet No. 1 (FISH 2006); *Creating Digital Resources for the Visual Arts: Standards and Good Practice* (Visual Arts Data Service and Technical Advisory Service for Images; online at http://vads.ahds.ac.uk/guides/creating_guide/contents.html); *Digital Archives from Excavation and Fieldwork: Guide to Good Practice, Second Edition*, ADS Guides to Good Practice (Richards and Robinson eds. 2000; also online at <http://ads.ahds.ac.uk/project/goodguides/excavation/>).

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 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.

Plans and drawings

The finished report must include a plan and section of each trench (even where no archaeological remains are recorded) plus plans and sections through excavated archaeological features.

The plans will include at least two site grid points and will show section line end points.

The plans will depict building material (i.e. brick and stone) where a complex of structures has been found.

Where there is a complex of interlocking multi-phased structures, a phasing plan will also be included. There will be elevation drawings of any standing structures such as walls.

Pro-forma context sheets will be used. All deposits and the base of the trench will be levelled. Levels will be expressed as metres above Ordnance Datum.

Stratigraphy shall be recorded even when no archaeological features have been recognised.

A 'Harris' matrix will be compiled where stratified deposits are recorded.

2) Post-excavation and report production

Finds Processing and Storage

The Archaeological Contractor will process, record and catalogue finds in accordance with guidelines set out by the Museum and Galleries Commission (1992), the UKIC and the IfA (2008) and will 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 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 Appendices 2 and 3 for more information).

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); see *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 *Standard and guidance for the collection, documentation, conservation and research of archaeological materials* (IfA 2008). 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 400 387) where necessary.

PRODUCTS

The Report

1. The Archaeological Contractor must produce an interim report of 200 words minimum, **two weeks after the completion of the fieldwork**, for the Client, the LPA, English Heritage and the CA. This will contain the recommendations for any further work needed on site. Comments that these bodies make on this interim report, particularly on the recommendations for further work, will be incorporated into the final report on this work

2. The archaeological contractor must produce a report, **within one month of the completion of fieldwork**, reflecting lessons learned on addressing the issue of archaeological remains in Enterprise Zones, together with recommendations for how archaeological issues could be approached in other Enterprise Zones to enable sustainable growth. Although the contractor should include this report as an appendix within the final evaluation report, it should be regarded as a stand-alone document,

3. The production of Site Archives and Finds Analysis will be undertaken according to English Heritage guidelines set out in MoRPHE.

3. A full archive report or post-excavation assessment, with the following features should be produced **within six months of the completion of the fieldwork**. 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.
- Copy of this specification.

4. Ten bound and collated copies of the report needs to be submitted, including one for deposition in the County HER at the address on the first page.

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

- one for the commissioning client – Capita Symonds;
- • one for deposition in the County HER at the address on the first page this CD will also include all of the digital images as TIFFs and the accompanying metadata;
- 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 Client directly to the address on the first page. 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.

Publication

If significant archaeological features are found during the evaluation, the results may also warrant publication. An estimate of the cost writing-up this evaluation and incorporating the results into the wider programme should be submitted as a heading within the overall project cost.

Archive Preparation and Dissemination

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, 1).

The site archive (records and materials recovered) should be prepared in accordance with: *MAP2* Section 5.4 and Appendix 3; *MoRPHE Project Planning Notes* 'PPN3 – Archaeological Excavation'; *Archaeological documentary archives* (IFA Paper No. 1); *Archaeological Archives – Creation, Preparation, Transfer and Curation* (Archaeological Archives Forum et al.); *Guidelines for the Preparation of Excavation Archives for Long Term Storage* (UKIC 1990); *Archaeological Archives – A guide to best practice in creation, compilation, transfer and curation* (Brown, Archaeological Archives Forum 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 (0191 222 8996). A letter will be sent to the CA 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*.

Archaeology Data Service (ADS)

The digital archive including the image files can, if the appointed archaeologist and commissioning client choose to, be deposited with the ADS 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; <http://ads.ahds.ac.uk>

SIGNPOSTING

OASIS

The Tyne and Wear County Archaeologist supports the 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 ADS.

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 your Client 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 NMR (01793 414 600 or oasis@english-heritage.org.uk). For enquiries of a technical nature please contact: Catherine Hardman at the ADS (tel. 01904 433 954 or oasis@ads.ahds.ac.uk). Or contact the Tyne and Wear Archaeology Officer at the address on the first page of this Specification.

3) Monitoring

The Archaeological Contractor will inform the CA of the start and end dates of the excavation to enable the CA to monitor the work in progress. Should important archaeological deposits be encountered, the CA must be informed. If further archaeological evaluation is required on this site, then the Archaeological Contractor must submit a written scheme of investigation for approval by the CA before extending the size of the trenches.

SPECIFICATION APPENDICES

1. 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 400 387) **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 MAP2/MoRPHE and *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* (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-slugs (hammer-scale and spherical droplets). Guidance should be sought from the English Heritage Regional Science Advisor 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 (strontium₈₇ or strontium₈₈, etc.) and mineralogical composition.

See *Archaeomagnetic dating* (English Heritage 2006); *Guidelines on the X-radiography of archaeological metalwork* (English Heritage 2006); *Metals and metalworking: a research framework for archaeometallurgy* (Historical Metallurgy Society 2008); *Archaeometallurgy* (Centre for Archaeology Guidelines 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 documents *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* (English Heritage 2010). 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 as soon as possible 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 in *Dendrochronology* (2004).

Leather and organic materials

Waterlogged organic materials should be dealt with following guidelines set out in *Waterlogged Organic Artefacts* (English Heritage 2012).

2. 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 CA. 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 *McMinn The Human Skeleton* (Abrahams et al. 2008).

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 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 agreed beforehand.

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 'Bodies, minds and human remains', Thompson in 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 'Lead poisoning', Needleman 2004 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); *Human Remains in archaeology: a handbook* (Roberts, 2009).

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 - website:

<http://www.britarch.ac.uk/churches/humanremains/index.html>

3. Treasure

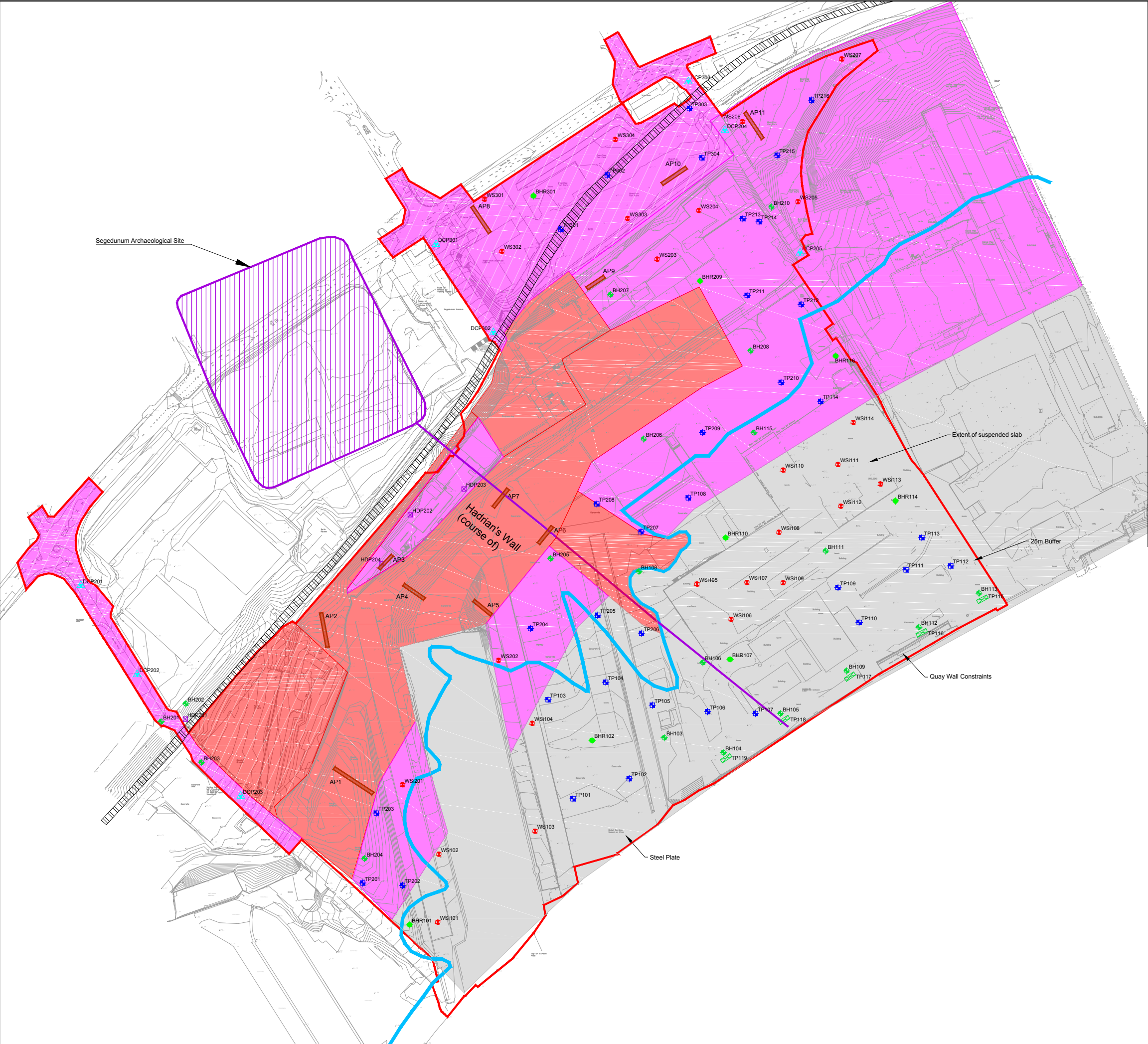
Defined under the *Treasure Act 1996* as:

- 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', 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 222 5076 or Robert.Collins@newcastle.ac.uk) who can provide guidance on the *Treasure Act* procedures.

If you need this information in another format or language, please contact David Heslop, County Archaeologist.

Appendix B Previously-Formed Exploratory Hole Records



KEY

CABLE PERCUSSION BOREHOLE WITH ROTARY FOLLOW-ON

CABLE PERCUSSION BOREHOLE

TRENCH TO POSITION CP BOREHOLE

WINDOW SAMPLER (i denotes 'indoor' borehole)

MACHINE EXCAVATED TRIAL PIT

ROAD CORE & DYNAMIC CORE PENETROMETER

HAND DUG PIT

PROPOSED ARCHAEOLOGICAL TRENCH

MASTERPLAN SITE BOUNDARY

ROMAN POTENTIAL 1

ASSUMED ROMAN POTENTIAL 1 BY CSS

ROMAN POTENTIAL 2

ASSUMED ROMAN POTENTIAL 2 BY CSS

ROMAN POTENTIAL 3

HIGH WATER MARK (APPROXIMATE)

Rev	Date	Revision	By	Checked	Authorised
Client:					
NORTH TYNESIDE DISTRICT COUNCIL					
Project:					
SWANHUNTER MASTERPLAN					
Title:					
PROPOSED EXPLORATORY HOLE LOCATION PLAN					
<div><div>CAPITA SYMONDS STRUCTURES</div><div>Consulting Civil, Structural & Geo-Environmental Engineers</div><div>MANCHESTER Clemence House, 9 Mellor Road Cheadle Hulme, Cheshire, SK8 5AT Tel: (+44) 0161 486 1521 Fax: (+44) 0161 486 1580 E-mail: capitasymonds.cheadle@capita.co.uk www.capitasymonds.co.uk/structures</div><div>Offices also at: Bristol Cambridge London Sheffield Watford Special Projects: Cheadle Hulme</div></div>					
Drawn at	Scale @ A3	Date			
MANCHESTER	1:2500	APR '13			
Drawn	Checked	Authorised			
END	MSG	MSG			
Project No.:		Drawing No.:		Revision:	
SS018684		G006		-	

Appendix C Plan illustrating Extent of Made Ground



- KEY**
- WYG Cable Percussion Boreholes (2009)
 - WYG Trial Pits (2009)
 - NAA Window Sample (2007) - no logs
 - NAA Trial Pits (2007) - no logs
 - Exploration Associates (RH Archive) Boreholes (2001) - no logs
 - AEG Cable Percussion Boreholes (1999)
 - AEG Trial Pits (1999)
 - AEG Prelim Boreholes (1998)
 - HJT Solmek (RH Archive) Boreholes (1990)
 - SES (RH Archive) Borehole (1982)
 - BGS Boreholes

Rev	Date	Revision	By	Checked	Authorised

Client:
NORTH TYNESIDE DISTRICT COUNCIL

Project:
SWANHUNTER MASTERPLAN

Title:
RECORDED THICKNESS OF MADE
GROUND (AND ESTIMATED
CONTOURS)

CAPITA SYMONDS
STRUCTURES

Consulting Civil, Structural & Geo-Environmental Engineers
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London Sheffield
Watford
Special Projects: Cheshire Hulme

Drawn at MANCHESTER	Scale @ A3 1:2500	Date MAR '12
Drawn END	Checked MSG	Authorised MSG

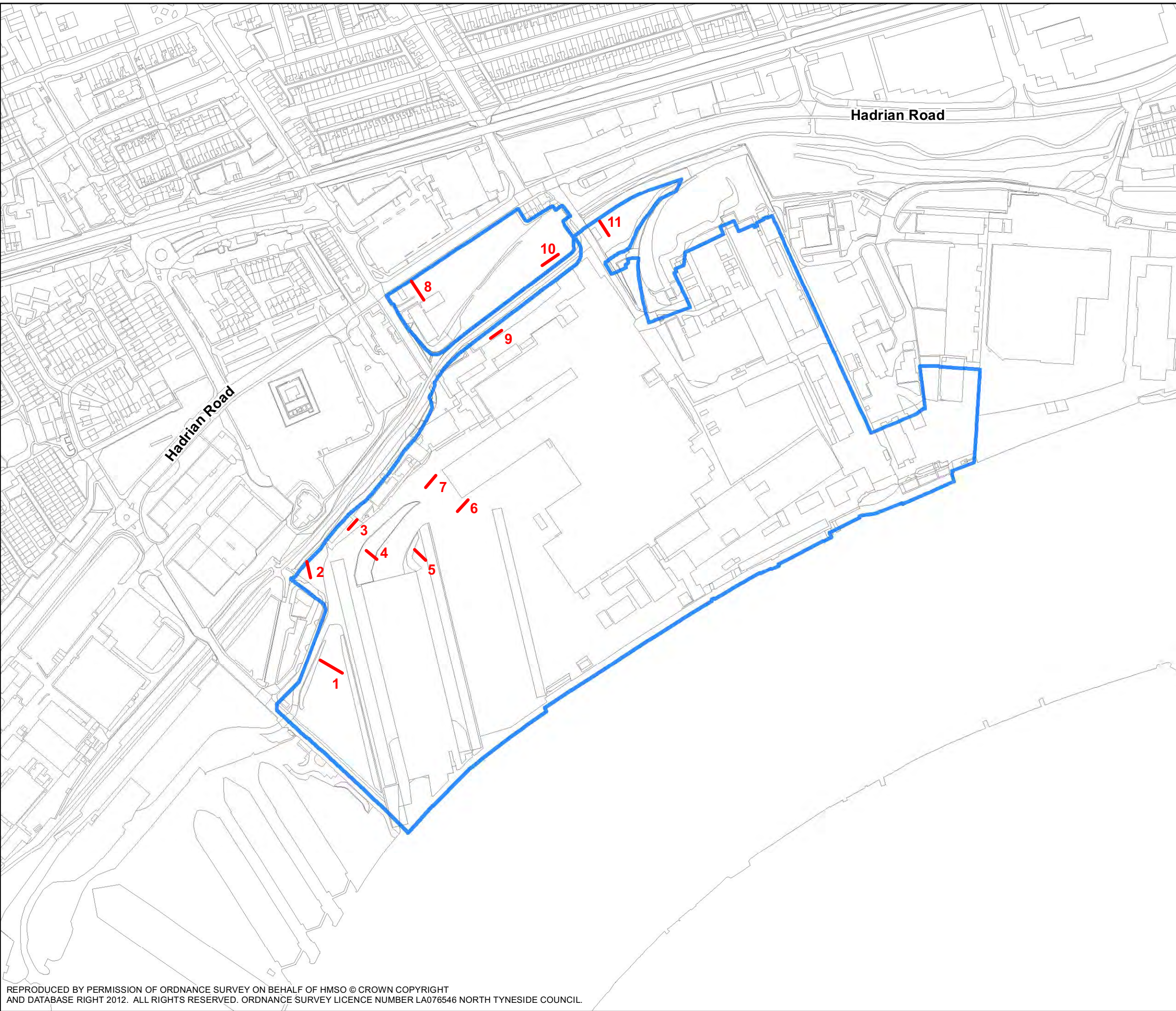
Project No.: SS018684	Drawing No.: G002	Revision: -
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Appendix D List of Reports (on archaeological and other works that must be consulted by the tenderers)

Report Title (Copies held by HTC and CSL)	Author/Client/Date
BGS Archive Borehole Logs	T.F.Burns & Partners – Unknown Date
Feasibility Study.	Entec Doc Ref: 9518MF. Doc Date: April 1999.
Site Investigation Contamination Interpretive Report.	Entec Doc Ref: 9518MF. Doc Date: April 1999.
Assessment of Archaeological Potential.	Entec Doc Ref: 9518MF. Doc Date: May 1999.
Geotechnical Desk Study.	Entec Doc Ref: 9518MF. Doc Date: May 1999.
Ground Investigation Report (Volume 1 and 2).	Allied Exploration & Geotechnical (AEG) Doc Ref: 1980. Doc Date: May 1999.
Geotechnical Interpretive Report.	Entec Doc Ref: 9518MF. Doc Date: June 2000.
Preliminary Geo Environmental Appraisal	Sirius (for Swan Hunter) August 2007
Swan Hunter Wallsend Archaeological Appraisal (included watching brief in 2007)	Northern Archaeological Associates for Commercial Estates Group July 2007
Geotechnical and Ground Contamination Desk Top Assessment V2.	White Young Green for One North East Doc Ref: E006915-147. Doc Date: October 2008.

Appendix E Extent of LDO Boundary with Numbered Trenches

T:\CS059146 Inverness West Link Road\2 Project File\2 Work Activity\2 Environment Team\14 GIS\2_MXD\2_EnvironmentalStatement\CS061956 Swan Hunter Yard Wallsend_03_LDO Boundary.mxd



Key

Local Development Order Boundary


Trench Locations

Note:

01	17/06/13	Draft plan created		
REV	DATE	DESCRIPTION	CKD	APD

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THE CAPITA BUILDING
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FAX. 01228 673111

CLIENT


North Tyneside Council

PROJECT:
**SWAN HUNTER YARD
WALLSEND**

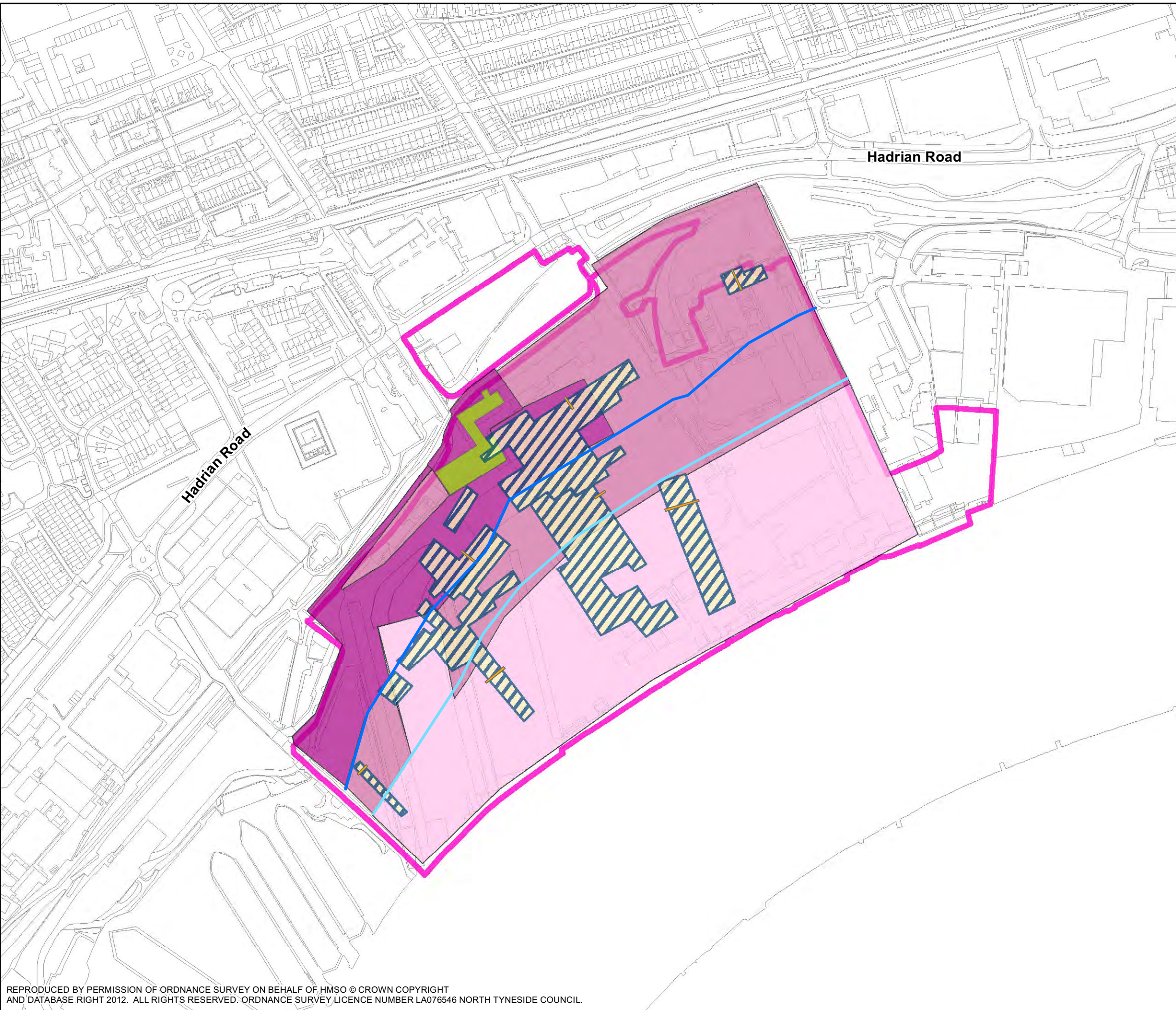
DESIGN PROJECT REF: CS/061956	CLIENT PROJECT REF:
SCALE @ A3 1:3,500	DATE 17/06/2013

TITLE
**CULTURAL HERITAGE
LOCAL DEVELOPMENT
ORDER BOUNDARY**

DRAWING NUMBER: CS/061956/E_03	REV: 01
--	-------------------

Appendix F Extent of Roman Archaeology

T:\CS061956 Swan Hunter Yard Wallsend\2 Project File\2 Work Activity\GIS\2_MXD\CS061956 Swan Hunter Yard Wallsend_02_Potential for Roman Archaeology_02.mxd



- Key
- Local Development Order Boundary
 - Roman Potential 1
 - Roman Potential 2
 - Roman Potential 3
 - Former River Roman High
 - Former River Roman Low
 - Retained Buildings
 - Industrial Buildings
 - Industrial Evaluation

Note:

01	14/05/13	Draft plan created		
02	16/05/13	Draft plan edited		
	17/06/13	New LDO Boundary		

REV	DATE	DESCRIPTION	CKD	APD
-----	------	-------------	-----	-----

CAPITA SYMONDS

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FAX: 01228 673111

CLIENT



PROJECT:
**SWAN HUNTER YARD
WALLSEND**

DESIGN PROJECT REF: CS/061956	CLIENT PROJECT REF:
SCALE @ A3 1:3,500	DATE 17/06/2013

TITLE

**CULTURAL HERITAGE
POTENTIAL FOR
ROMAN ARCHAEOLOGY**



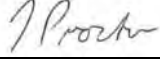
DRAWING NUMBER: CS/061956/E_02	REV: 02
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DOCUMENT VERIFICATION

**THE FORMER SWAN HUNTER SITE, STATION ROAD,
WALLSEND, NORTH TYNESIDE, TYNE AND WEAR**

ADDENDUM TO EVALUATION REPORT

Pre-Construct Archaeology Limited Quality Control	
<i>Project Number</i>	K3585
<i>Site Code</i>	SHS 14
<i>Report Number</i>	Addendum to RN11029

<i>Task</i>	<i>Name</i>	<i>Signature</i>	<i>Date</i>
Text prepared by:	Aaron Goode and, Jennifer Proctor		June 2014
Text checked by:	Gary Brown		18 June 2014
Graphics prepared by:	Jennifer Simonson		17 June 2014
Graphics checked by:	Josephine Brown		19 June 2014
Post-Excavation Manager sign-off:	Jennifer Proctor		19 June 2014

<i>Revision No.</i>	<i>Date</i>	<i>Checked by</i>	<i>Approved by</i>

**Pre-Construct Archaeology Limited
North Regional Office
Unit N19a Tursdale Business Park
Durham
DH6 5PG**

**AN ARCHAEOLOGICAL EVALUATION OF THE
FORMER SWAN HUNTER SITE,
STATION ROAD, WALLSEND,
NORTH TYNESIDE, TYNE AND WEAR**

ADDENDUM: TRENCH 5

JUNE 2014

ARCHAEOLOGICAL EVALUATION (PHASE 2) AT FORMER SWAN HUNTER SHIPYARD, WALLSEND, NORTH TYNE, TYNE AND WEAR

Following the main phase of evaluation and subsequent production of a report in October 2013, a second phase of evaluation took place at the former Swan Hunter Shipyard. This Addendum to the main report details the results of this second phase of work, which comprised the investigation of a single trench (Trench 5) on 9–11th June 2014. Trench 5 was relocated from its original position as detailed in the Specification due to Health and Safety considerations. The relocated Trench 5 was positioned a short distance to the north-west of its original location, on the south-eastern edge of the sloping slipway leading to the Wet Dock (Figure A1).

The concrete slab was broken out by the client on Friday 6 June across an area that measured 3.80m NW-SE by 3.20m NE-SW. Ground reduction was undertaken on Monday 9 June using a JCB with ditching bucket with all work carried out under archaeological supervision. Modern overburden was removed to a level of 1.30m across the trench and further deposits were removed by machine and hand excavation from the centre of the trench across an area that measured 2.80m by 1.70m in order to examine the archaeological sequence safely.

Trench 5

Natural Sub-stratum

The natural clay sub-stratum, [506], comprising stiff pinkish brown clay, was encountered in the south-eastern corner of the trench at a minimum of depth of c. 1.40m below existing ground level. It was recorded at a maximum height of 3.83m OD in this area and elsewhere had been truncated by an early post-medieval feature, [505]. Natural clay was exposed across the base of this feature in the central part of the trench, where it was recorded at a minimum height of 3.36m OD (Figure A2).

Post-medieval Dockside Activity

Part of a substantial feature, [505], was recorded truncating the natural clay sub-stratum, across the majority of the trench. Only a small portion of the edge of this feature was exposed within the south-eastern corner of the trench. This edge was aligned ENE-WSW and the base of the feature sloped down from NW to SE (Figure A3). The maximum exposed depth of the feature was 0.68m and it was encountered at a maximum height of 4.04m OD, although it had been horizontally truncated during the construction of the slipway. Its primary fill comprised dark grey humic clayey silt, [504], up to 0.30m thick. A small mixed finds assemblage was recovered from this deposit which included material of Roman, medieval and post-medieval date. The latest datable material comprised pottery and clay tobacco pipe of 17th-century date which may indicate a possible date for the infilling of the feature. Its upper fill comprised dark grey humic fine sandy silt, [503], up to 0.40m thick, from which no artefactual material was recovered. The function of this feature is uncertain, however it is likely represent an early post-medieval dockside feature, with its location within the vicinity of the high water mark of ordinary tide as depicted on the First Edition Ordnance Survey map of c. 1860 (Figure A4). The composition of its infills certainly indicates deposition by water.

A substantial rectangular timber post (240mm x 160mm x c. 800mm long) with a sharpened triangular base and fifteen stakes (c. 50mm x 30mm), [507], were recorded along the south-eastern edge of the trench running in an NE-SW alignment. The post and stakes were rammed through the fill of feature [505], with the larger post penetrating a short distance into the underling boulder clay. These probably represent part of a timber retaining structure associated with dockside activity. Although the date of this timber structure is uncertain it is likely to be later post-medieval in date and post-dates feature [505].

Modern

The dockside feature [505] and the timber retaining structure [507] were horizontally truncated by 20th-century levelling activity associated with the construction of the slipway leading to the Wet Dock, located c. 30m to the south-west of Trench 5.

Features [505] and [507] were overlain by a c. 0.80m thick mid grey brown silty clay deposit, [502], which contained large pieces of concrete and stone and represents a levelling deposit associated with the slipway. This was directly overlain by a c. 0.32m thick deposit of limestone/dolomite, [501], forming a levelling and consolidation deposit for a c. 0.32m thick steel reinforced concrete slab [500] that formed the existing surface for the slipway to the Wet Dock. This was located at a height of 5.18m OD.

Finds Identification

Roman pottery

SAMLZ (1 sherd, 5g) – abraded, no decoration, date: AD 120-250

BB1 (1 sherd, 12g, 0.04 EVE) – 5J type dish, date: AD 120-400

UNID (1 sherd, 6g) – unidentified grey ware, date: AD 43-400

UNID (1 sherd, 6g) – unidentified grey ware, date: AD 43-400

Medieval and post-medieval material

Pottery

Three fragments, including two joining base sherds, of a Weser (German) slipware dish. Likely to be first half of the 17th century.

A small fragment of grey stoneware, probably salt glazed but external surface is worn and discoloured.

Clay tobacco pipe

Two pieces of pipe stem; stem bores between 7 and 8/64ths of an inch, 17th century.

Ceramic building material

Brick fragment (326g), dark orange-brown/yellowish sandy fabric. 38mm thick. No other measureable dimension. Mould mark along one margin. Tyneside type 3/5 (see Fraser *et al.* 1995, 186). Late medieval (14th/15th century).

Floor tile fragment, corner (170g.) Light orange-red sandy fabric with some large inclusions of clay. Surface glaze worn off, bevelled edges – probably originally square. 25mm thick. Medieval.

Small surface flake (7g), dark red quite hard fabric. Probably post-medieval brick or tile.

?CBM. Fragment (25g) with no surfaces, mid red-brown with grey core.

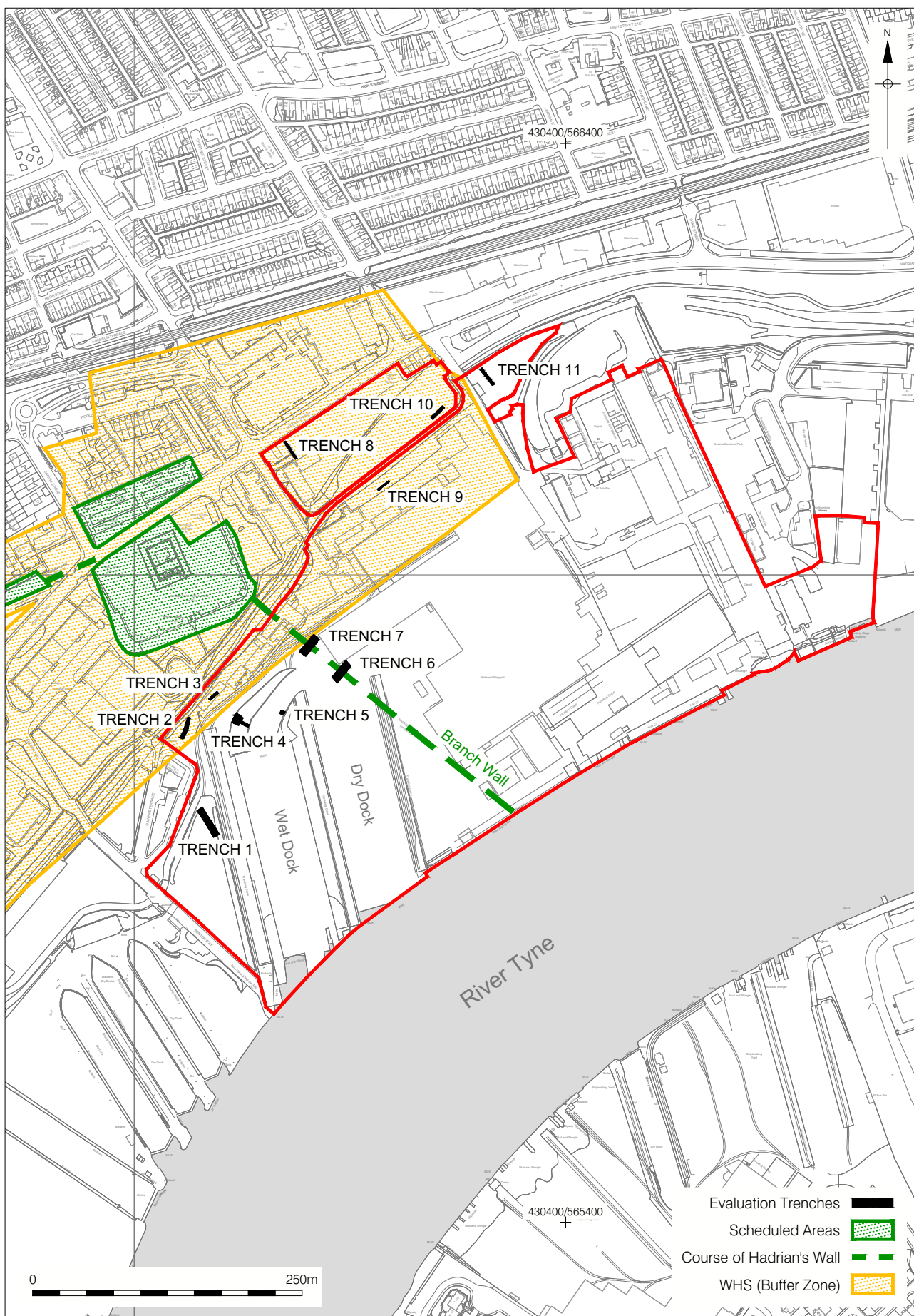
Discussion

The investigation of Trench 5 demonstrated that prior to the construction of the slipway, ground reduction had taken place to level and consolidate the sloping natural topography of the valley side. A series of deposits were then dumped over the truncated ground surface to create a foundation for the road. Due to this sloping topography, the level of truncation of any potential archaeological deposits and to the natural sub-stratum will have been greater to the north-west where original ground level would have been higher. It is very unlikely that any Roman deposits would have survived beneath the slipway in this area.

A dockside feature, of possible earlier post-medieval date, was recorded within Trench 5. With only a small area exposed, it was not possible to establish its function. This was post-dated by a line of timber stakes and a post which are likely to have formed part of a later post-medieval waterfront timber structure. Overlay of the trench location onto the 1860 Ordnance Survey map shows that prior to land reclamation activity and subsequent quayside construction, the original riverfront lay some 200m to the north-west of its present position, in the vicinity of Trench 5. It is considered likely that post-medieval archaeological features associated with the waterfront will survive beyond the confines of the trench in the area of the slipway.

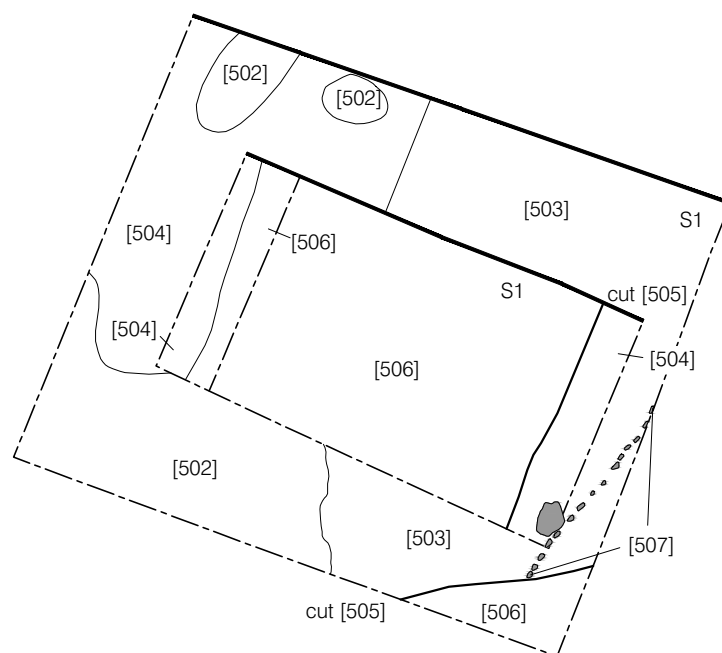
Bibliographic Reference

Fraser, R., Jamfrey, C. and Vaughan J.E. 1995. 'Excavation on the site of the Mansion House, Newcastle, 1990', *Archaeologia Aeliana* 5th series, vol. 23.



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 17/06/14 MR & JS

Figure A1
 Detailed Site and Trench Location
 1:5,000 at A4

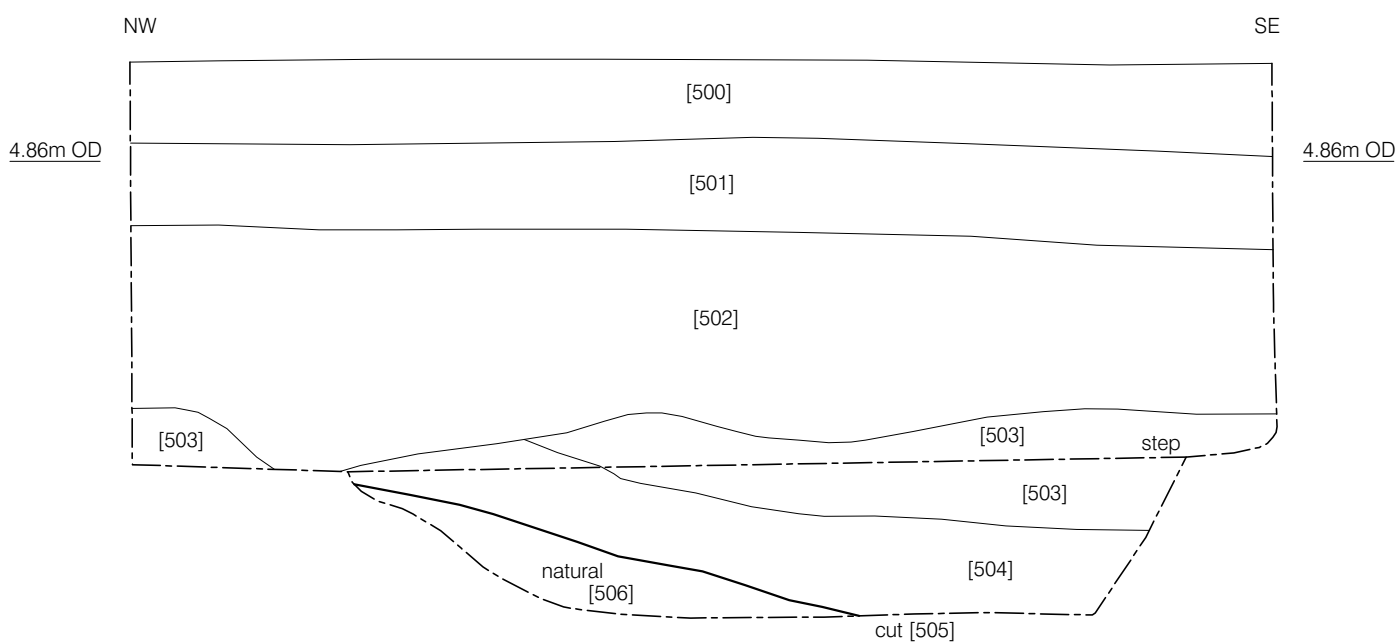


■ timber post/stake

0 2m

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Figure A2
Plan of Trench 5
1:50 at A4



Section 1
Trench 5
Southwest Facing

0 1m

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17/06/14 JS

Figure A3
Trench 5 Section
1:25 at A4



Plate A1: Trench 5, looking north-west (scale 1x1m)



Plate A2: Trench 1, NW facing section (scale 1x1m)

PCA

PCA SOUTH

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