

**AN ARCHAEOLOGICAL EVALUATION
AT THE JUNCTION OF WESTGATE ROAD
AND BRIGHTON GROVE, NEWCASTLE
UPON TYNE, TYNE AND WEAR**

EVALUATION REPORT

MARCH 2018

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An Archaeological Evaluation at the Junction of Westgate Road and Brighton Grove, Newcastle upon Tyne, Tyne and Wear

Site Code: WRN 18

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DOCUMENT VERIFICATION

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BRIGHTON GROVE, NEWCASTLE UPON TYNE, TYNE AND WEAR**

EVALUATION REPORT

Pre-Construct Archaeology Limited Quality Control	
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1. NON-TECHNICAL SUMMARY

- 1.1 An archaeological evaluation was undertaken by Pre-Construct Archaeology Limited at the junction of Westgate Road and Brighton Grove, Newcastle upon Tyne, Tyne and Wear at National Grid Reference NZ 22980 64420. The fieldwork, undertaken 12th-14th February 2018, was commissioned by Newcastle City Council as part of the planning process in advance of proposed resurfacing, kerb works and traffic signal works on Westgate Road.
- 1.2 At this location Westgate Road follows the projected line of Hadrian's Wall, within the corridor of the UNESCO transnational World Heritage Site, 'Frontiers of the Roman Empire', although this area of Hadrian's Wall is not a Scheduled Monument. The site therefore had potential for the presence of archaeological evidence of the Wall and associated features.
- 1.3 A specification for the work was issued by Tyne and Wear Archaeology Service, Newcastle City Council. The evaluation comprised six trenches (Trenches 1-6) which were either located within the Frontiers of the Roman Empire (Hadrian's Wall) 'buffer zone' or immediately to the north of the 'buffer zone'. All evaluation trenches were located within pedestrian footways, with Trenches 1 & 2 located on the southern side of Westgate Road, Trenches 3 & 4 located on the eastern side of the junction of Westgate Road and Brighton Grove and Trenches 5 & 6 located on the western side of the junction of Westgate Road and Brighton Grove.
- 1.4 The aim of the archaeological evaluation was to provide information regarding the character, nature, depth and degree of survival of archaeological deposits at specific locations where revised signalised traffic access would be required at the road junction. In specific terms, the main objective was to provide archaeological evidence of any elements of the Hadrian's Wall frontier.
- 1.5 In all six trenches 20th century and modern services, levelling deposits and deposits associated with the footway construction were encountered to the depth of the impact of the proposed works. No deposits of archaeological significance were identified in any of the evaluation trenches.
- 1.6 In summary, no archaeological features, deposits or structures associated with the Hadrian's Wall frontier were recorded in any of the evaluation trenches.

2. INTRODUCTION

2.1 Project Background

- 2.1.1 This report details the methodology and results of an archaeological evaluation undertaken by Pre-Construct Archaeology Limited (PCA) on the 12th–14th February 2018 on the junction of Westgate Road and Brighton Grove, Newcastle upon Tyne. The work was commissioned by Highway Maintenance, Newcastle City Council. The archaeological work comprised six evaluation trenches (Trenches 1-6) located within areas of pedestrian footways at the junction of Westgate Road and Brighton Grove at central National Grid Reference NZ 22980 64420 (Figures 1 and 2).
- 2.1.2 Newcastle City Council are proposing resurfacing, kerb works and traffic signal works at the junction of Westgate Road and Brighton Grove (Figure 3). At this location the projected line of Hadrian's Wall is thought to follow Westgate Road closely therefore the site had potential for remains of the Roman period.
- 2.1.3 The archaeological evaluation comprised six trenches measuring 1.50m x 1.50m excavated to a maximum depth of 0.55m. The precise size, position and depths of the trenches had to be adjusted due to the location of modern services. The scope of work for the archaeological evaluation was set out in a specification compiled by the Tyne and Wear Archaeology Service (Newcastle City Council 2017).
- 2.1.4 The Site Archive (PCA site code: WRN 18) is currently held at the Durham Office of PCA (Unit N19a Tursdale Business Park, Durham, DH6 5PG) and the retained element, comprising the written, drawn and photographic records will be deposited with Tyne and Wear Museums and Archives at Arbeia, South Shields, Tyne and Wear.
- 2.1.5 The Online Access to the Index of Archaeological Investigations (OASIS) reference number for the project is: preconst1-310677.

2.2 Site Location and Description

- 2.2.1 The archaeological evaluation comprised six trenches located at the junction of Westgate Road and Brighton Grove, Newcastle-upon-Tyne, Tyne and Wear, at central National Grid Reference NZ 22980 64420 (Figure 1).
- 2.2.2 All trenches were located within the pedestrian footway with Trenches 1 & 2 located to the south of Westgate Road, Trenches 3 & 4 located to the east at the junction of Westgate Road and Brighton Grove and Trenches 5 & 6 located to the west at the junction of Westgate Road and Brighton Grove.
- 2.2.3 Trenches 1, 2, 4 & 6 are located within the Frontiers of the Roman Empire (Hadrian's Wall) 'buffer zone' and Trenches 3 & 5 are located immediately to the north of the 'buffer zone'.

2.3 Geology and Topography

- 2.3.1 The site lies in the eastern sector of Hadrian's Wall where the Roman frontier crosses the Westphalian Coal Measures of the Upper Carboniferous. In the Benwell area, to the west of the site, the solid geology is formed by the upper part of the Middle Coal Measures, this being sandstone with mudstone-pebble conglomerate (Johnson 1997). The drift geology of much of the eastern sector of the Wall area is characterised by Glacial Till (Boulder Clay).
- 2.3.2 At this location there is a gradual downward slope from west to east along Westgate Road with the uppermost surfaces of trenches at the junction recorded at a maximum height of 107.95m AOD for Trench 5 and a minimum height of 107.60m AOD for Trench 2.

2.4 Planning Background

- 2.4.1 The elements of the proposed Westgate Road and Brighton Grove Junction improvement involve the resurfacing of the carriageway along Westgate Road at the junctions of Bentinck Road, Brighton Grove and Lynnwood Terrace, the lifting and relaying of pedestrian footway surfaces at the junction of Westgate Road and Brighton Grove and the revisions to the signalised traffic access at the road junction of Westgate Road and Brighton Grove and associated ducting. The proposed depth of the traffic signal ducting will be 550mm, which could potentially impact upon archaeological remains of the Hadrian's Wall frontier.
- 2.4.2 The results of the archaeological evaluation were required as to inform the Local Planning Authority (LPA), Newcastle City Council, ahead of the proposed Westgate Road/Brighton Grove junction improvements. The archaeology work was undertaken at the request of the Tyne and Wear Specialist Conservation Team. The aim was to inform the LPA of the significance of the heritage assets affected by the proposed junction improvements.
- 2.4.3 Chapter 12 of the NPPF *Conserving the historic environment* describes in paragraph 126, how LPAs should ... *set out in their Local Plan a positive strategy for the conservation and enjoyment of the historic environment* and details, in paragraph 128, that *in determining application, LPAs should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum, the relevant [Historic Environment Record] HER should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes or has the potential to include heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, LPAs should require developers to submit an appropriate desk-based assessment and where necessary [the results of] a field evaluation.*

2.4.4 At a local level, the Local Planning Authority (LPA), Newcastle City Council, has various policies within its Unitary Development Plan (UDP) concerning archaeology and cultural heritage. Of relevance are:

POLICY C04. DEVELOPMENT THAT WOULD HARM SITES OR AREAS OF ARCHAEOLOGICAL INTEREST AND THEIR SETTINGS WILL NOT BE ALLOWED.

and

POLICY C04.1. THE FOLLOWING SITES AND AREAS OF ARCHAEOLOGICAL INTEREST IDENTIFIED FOR THE PURPOSE OF POLICY C04 INCLUDE:

Scheduled ancient monuments

7.Hadrian's Wall, Vallum and associated works

Other sites and areas of archaeological interest, as defined on the Proposals Map

18.Unscheduled areas of the known and presumed line of Hadrian's Wall, Vallum, Ditch and fortifications.

2.4.5 The latter UDP policy not only deals with sites, monuments and areas which have scheduled monument status - these being worthy of preservation because of their national significance – but also other important known sites, monuments and areas which have considerable potential archaeological interest.

2.4.6 The Hadrian's Wall Military Zone was designated a UNESCO World Heritage Site in 1987, although the urban areas of Newcastle were excluded from the World Heritage Site. A management plan (English Heritage 1996) identified three distinct areas: the 'archaeological core' of the Wall and Vallum (the World Heritage Site), the surrounding 'buffer zone' and the outer 'visual envelope'. In 1997 the portions of the Wall afforded statutory protection as scheduled monuments in the urban areas of Newcastle were included in the World Heritage Site. In 2005 UNESCO amalgamated the Hadrian's Wall and the German Limes World Heritage Sites into the transnational World Heritage Site 'Frontiers of the Roman Empire'.

2.4.7 While the section of the Wall in the vicinity of Westgate Road and Brighton Grove junction is not scheduled, the UDP policies described above allow the planning system adequate provision for the preservation of archaeological remains associated with the Wall and its buffer zone. In addition, English Heritage provides specific archaeological advice relating to the Hadrian's Wall frontier through its Historic Environment Advisor Archaeology (Hadrian's Wall).

2.4.8 A specification was issued by Claire MacRae, Tyne and Wear Archaeological Officer at Newcastle City Council for the archaeological evaluation (NCC 2017).

2.4.9 In Sum, the archaeological evaluation was required, as part of the planning process, to inform the LPA regarding the character, date, extent and degree of survival of archaeological remains, specifically those associated with the Hadrian's Wall frontier, at the junction of Westgate Road and Brighton Grove in association with the proposed junction improvements. The results should inform a decision by the Tyne and Wear County Archaeologist regarding further archaeological mitigation measures.

2.5 Archaeological and Historical Background

An archaeological desk-based assessment undertaken in 2004, has been used as the basis of the following summary. The research and writing of those responsible from CgMs is gratefully acknowledged. Other information has been taken from 'Sitelines', the online Tyne and Wear Historic Environment Record and other online sources

- 2.5.1 There are no scheduled monuments on the proposed site, or in its immediate vicinity.
- 2.5.2 No sites or finds dating to the various prehistoric eras are recorded on the Tyne and Wear Historic Environment Record (HER) within 1km of the site. Late prehistoric activity recorded at Denton (c. 4km to the west) is thought to represent evidence for Iron Age cultivation and potential settlement activity. In spite of this nearby activity, the lack of a reliable water supply may have made the site unattractive for permanent settlement.
- 2.5.3 The site bordered by a section of Hadrian's Wall that lies between Benwell (*Condercum*) fort (1.5km to the west) and *Pons Aelius* Fort (2km to the east). Although not scheduled in this particular part of Newcastle, the Wall corridor as a whole is a World Heritage Site, with three distinct areas - the 'archaeological core', the surrounding 'buffer zone' and the outer 'visual envelope' – having been defined. Hadrian's Wall and the German Limes World Heritage Sites were amalgamated by UNESCO in 2005 into the transnational World Heritage Site 'Frontiers of the Roman Empire'.
- 2.5.4 Hadrian's Wall in this part of Newcastle consisted of a stone wall c. 5m high and c. 3m wide (Breeze and Dobson 2000). To the north of the Wall was a ditch, this separated from the Wall by an open flat space, a berm, usually 6m wide on the stone section of Wall because of the pressure on the south lip of the ditch from the weight of the Wall (on the turf Wall the berm was only 1.80m wide). The ditch varied in width from 8m to 12m, but was generally c. 8.20m wide, and was between 2.70m to 3m deep. It was V-shaped in profile with a square-cut drainage or clearing-out channel at the base. The material excavated from the ditch was deposited on the north side and smoothed out to heighten the outer scarp of the ditch.
- 2.5.5 A deep ditch with banks on either side, the Vallum, was located to the south of the Wall. It is generally thought that Hadrian's Wall in the vicinity of the site, between Milecastles 5 and 6, follows the line of Westgate Road, with the north ditch running parallel to the northern edge of Westgate Road.
- 2.5.6 In 2002, an archaeological evaluation at Prospect House on Grainger Park Road, south of the site, aimed to locate the Vallum ditch and northern mound as depicted on Ordnance Survey mapping, running at a distance of c. 80m from the expected line of the Wall below Westgate Road. No evidence of the feature was found, suggesting that the Vallum ditch lies to the south of the line shown on the Ordnance Survey, perhaps at a distance nearer to 100m, which would be consistent with antiquarian and earlier map evidence.
- 2.5.7 To the east of the site an archaeological evaluation was undertaken in 2010 at the junction of Westgate Road and Grainger Road with the aim of providing archaeological evidence of

any elements of the Hadrian's Wall frontier (PCA 2010). To this end no archaeological remains associated with Roman activity was identified.

- 2.5.8 No finds or sites dating to the Saxon/early medieval period have been identified within 1km of the site. Very little is known about the character, extent and detailed location of post-Roman settlement in this part of Newcastle. In the late Saxon period, a small community of monks settled at Monkchester, near to *Pons Aelius* fort.
- 2.5.9 During the medieval period, the site lay within the township of Elswick, within the parish of Newcastle, St. John. Elswick was granted to Tynemouth Priory in 1120 and the estate was held until the Dissolution in the 16th century. Evidence of field names from medieval rentals of the manor suggests that agricultural land was being created through woodland clearance until a relatively late date. References mentioning mineral mining '*in the field of Elswick*' exist dating to the 13th century and in 1378 '*the coal pits with way and staiths*' were valued at £40 per annum. However, no archaeological evidence of medieval date has been found within 1km of the site, which probably lay beyond the settlement limits of both Newcastle and Elswick.
- 2.5.10 Construction of a toll road from Newcastle to Carlisle - commonly called the Military Road - on the same alignment as the ancient route westwards out of Newcastle, began after the Jacobite Rebellion of 1745. During that uprising the lack of serviceable east-west communication prevented the Royal army based at Newcastle from relieving the besieged town of Carlisle. The Newcastle to Carlisle Military Road was one of the later elements of a long-running programme of road improvement works implemented by Field Marshal George Wade (1673-1748) who began constructing roads in the Highlands of Scotland in 1725 after being sent there on a military mission for George I. It is recorded that, despite protests from the antiquary William Stukeley, the Newcastle to Carlisle Military Road was partly built over Hadrian's Wall. The evaluation undertaken along the junction of Westgate Road and Grainger Road in 2010 exposed possible remains of the 18th century Military Road. In the easternmost trench to be investigated during that work, a stone surface, with remnants of a sandstone block surface treatment, was recorded at a depth of c. 1.05m below pavement level. A distinct silty layer above the surface produced two scraps of post-medieval pottery and two scraps of ceramic building material of uncertain date.

3. Aims and Objectives

3.1 Project Aims

3.1.1 The project is threat-led with potential to disturb or destroy important sub-surface archaeological remains of the Roman period. The broad aim of the project is to inform the LPA regarding the character, nature, date, depth and degree of survival of archaeological deposits at the site.

3.1.2 Archaeological trial trenching was chosen as the investigative tool to test the archaeological potential of areas to be affected by junction improvement scheme. Six trenches (Trenches 1-6) were sited in this area (Figure 2). Where possible, all trenches were to be excavated to the maximum depth of 550mm below existing ground level, with this likely to be the required depth for the associated groundworks, namely the installation of traffic signal ducting.

3.1.3 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.*

3.1.4 The results are to be used to inform decisions regarding further mitigation measures that may be required at the site.

3.2 Research Objectives

3.2.1 The archaeological work was considered to have good potential to make a significant contribution to existing archaeological knowledge of central Newcastle in general and of the Roman frontier in the city. 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) (Petts and Gerrard 2006), which highlights the importance of research as a vital element of development-led archaeological work. The second is the two-volume *Frontiers of Knowledge. A Research Framework for Hadrian's Wall* (Symonds and Mason (eds) 2009).

3.2.2 The NERRF identifies the key priority within the research agenda for the Roman period which is of direct relevance to the project:

- Riii – The Roman military presence

3.2.3 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*'.

3.2.4 This document highlights specific queries in relation to the monument. These include:

The Wall:

- **3.1 - Locating the Resource;** the precise course and distribution of the frontier installations and infrastructure remain uncertain.
- **3.2 - Existing Data;** the challenges that arise with utilising existing data.
- **3.3 - Chronology;** establishing the chronological relationship between the key Wall elements.
- **3.4 - Materials;** the precise source of structural material.
- **3.5 - Structures (Function, Curtain, Ditch, Obstacles, Milecastles, Turrets, Vallum);** the precise manner in which the Wall structures interacted and the resulting frontier system.

3.2.5 The specific research objective to be addressed by the project, given its location within the Frontiers of the Roman Empire (Hadrian's Wall) 'buffer zone', was:

- Do any sub-surface archaeological remains in the areas of investigation provide evidence of Hadrian's Wall itself or any other element of the frontier.

4. ARCHAEOLOGICAL METHODOLOGY

4.1 Fieldwork

- 4.1.1 The archaeological evaluation was carried out 12th to 14th February 2018. All fieldwork was undertaken in compliance with the codes and practice of the Chartered Institute for Archaeologists and the relevant ClfA standard and guidance document (ClfA 2014 a, b & c). PCA is a CIFA Registered Organisation. All fieldwork and post-excavation was carried out in accordance with the Yorkshire, the Humber & The North East: Regional Statement of Good Practice (SYAS 2011).
- 4.1.2 The archaeological evaluation comprised 6 No trenches (Trenches 1-6), with these set-out by Newcastle City Council, sited to target locations where the proposed traffic signal ducting is to be installed. All trenches were located within pedestrian walkways with Trenches 1 & 2 located to the south of Westgate Road, Trenches 3 & 4 located to the east at the junction of Westgate Road and Brighton Grove and Trenches 5 & 6 located to the west at the junction of Westgate Road and Brighton Grove (Figure 2).
- 4.1.3 The trenches were to measure 1.50m x 1.50m and to be excavated to a depth of 550mm. To this end the dimensions and depths of the trenches had to be adjusted due to the positions of variously aligned modern services. The actual dimensions of each trench are summarised in the table below:

Trench No.	Dimensions
1	1.86m E-W x 1.17m N-S x 0.50m deep
2	1.20m E-W x 1.27m N-S x 0.54m deep
3	1.23m E-W x 1.84m N-S x 0.52m deep
4	1.45m E-W x 1.52m N-S x 0.66m deep
5	1.70m NE-SW x 1.31m NW-SE x 0.43m deep
6	1.77m NE-SW x 1.36m NW-SE x 0.42m deep

Trench Dimensions

- 4.1.4 For all trenches the pedestrian footway surfaces and associated subbase were removed by Technical Services, Newcastle City Council, under archaeological supervision. All subsequent excavation of the trenches was undertaken by hand by PCA.
- 4.1.5 The trenches were to be excavated to a maximum depth of 550mm, to the top of the first significant archaeological horizon or the clearly defined top of the geological substratum, whichever was reached first. In some trenches excavation ceased when services were encountered which meant that further investigation was not possible.
- 4.1.6 All trenches were hand cleaned and recorded in section, where appropriate. Investigations within the trenches followed the normal principles of stratigraphic excavation and were conducted in accordance with the methodology set out in the field manual of PCA (PCA

2009) and the Museum of London Site Manual (Museum of London 1994). Each trench was located using a Leica Viva Smart Rover Global Navigation Satellite System (GNSS).

- 4.1.7 Deposits and cut features were individually recorded on the *pro-forma* Trench Recording Sheet and Context Recording Sheet. All site records were marked with the unique Site Code WRN18. All archaeological features were excavated by hand tools and were using standard single context recording methods. The height of all principle strata and features was calculated in metres above Ordnance Datum (m AOD) and indicated on appropriate plans and sections.
- 4.1.8 A detailed photographic record of the evaluation using SLR cameras (35mm film black and white prints for archive purposes) and by digital photography. All detailed photographs included a legible graduated metric scale. The photographic record illustrated both in detail and general context archaeological exposures and specific features in all trenches.

4.2 Post-excavation

- 4.2.1 The stratigraphic data for the project comprises written and photographic records. A total of 49 archaeological contexts were defined in the six trenches (Appendix 2). Post-excavation work involved checking and collating site records, grouping contexts and phasing the stratigraphic data (Appendix 3). A written summary of the archaeological sequence was then compiled, as described in Section 5.
- 4.2.2 During the evaluation no artefactual or ecofactual material was recovered from the evaluation trenches.
- 4.2.3 The palaeoenvironmental sampling strategy of the project was to recover bulk samples where appropriate, from well dated stratified deposits covering the main periods or phases of occupation and the range of feature types represented, with specific reference to the objectives of the evaluation. To this end, no palaeoenvironmental samples taken.
- 4.2.4 The complete Site Archive, in this case comprising only the written, drawn and photographic records (including all material generated electronically during post-excavation) 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 most recent ClfA publication relating to archiving (ClfA 2014c).
- 4.2.5 When complete, the site archive will be deposited with the relevant museum, under the site code WRN 18. The depositional requirements of the relevant museum which the Site Archive will be ultimately transferred will be met in full. At the time of writing this will be the Tyne and Wear Museums and Archives, Arbeia, South Shields. A completed transfer of title deed will accompany the Site Archive on deposition.

5. RESULTS: THE ARCHAEOLOGICAL SEQUENCE

During the archaeological investigation, separate stratigraphic entities were assigned unique and individual context numbers, which are indicated in the following text as, for example [123]. The archaeological sequence is described by placing stratigraphic sequences within broad phases, assigned on a site-wide basis in this case. An attempt has been made to add interpretation to the data and correlate these phases with recognised historical and geological periods. The figures can be found in Appendix 1 with the context index and stratigraphic matrix located in Appendix 2 and 3 respectively. A selection of plates can be found within Appendix 4.

5.1 Phase 1: Modern

5.1.1 Phase 1 represents modern activity with all contexts representing 20th century to modern services, levelling deposits and existing surface treatments. A brief summary of each trench is set out below.

Trench 1 (Figure 4, Section 1; Plate 1)

5.1.2 The earliest context to be recorded in Trench 1 was a WNW-ESE aligned iron pipe [4] encountered at a depth of 0.48m below present ground level. This in turn was overlain by three firm clayey silt levelling deposits, [3], [2] & [1], which had a maximum exposed thickness of at least 0.35m. A service trench [9], aligned WNW-ESE was recorded cutting the uppermost levelling deposit [1] and was at least 0.15m wide by at least 50mm deep. The service trench contained two power cables [50] and was backfilled with sand [10].

5.1.3 The existing ground surface forming the pedestrian footway comprised concrete paving slabs [7], recorded at a maximum height of 107.93m AOD, and associated c. 0.11m thick concrete sub-base [8]. A further power cable [51] was recorded within the concrete subbase [8] aligned WNW-ESE and was encountered c. 0.16m below present ground level.

Trench 2 (Figure 4, Section 2; Plate 2)

5.1.4 The earliest activity recorded in Trench 2 comprised modern services including a group of at least three orange plastic ducts [13] and two power cables [52]. The plastic ducts extended across Trench 2 aligned WNW-ESE and were encountered at a depth of c. 0.25m below the present ground level. The power cables [52] were only exposed within the eastern part of the trench and were encountered at maximum and minimum depths below present ground level 0.52m and 0.25m, respectively. Both modern services, [13] & [52], were overlain by a c. 0.24m thick deposit of weakly cemented silty sand [6] which contained frequent sub-angular stones. This in turn was overlain by a c. 0.23m thick weakly cemented gravelly sand deposit [5].

5.1.5 The existing ground surface forming the pedestrian walkway comprised concrete paving slabs [11], recorded at a maximum height of 107.94m AOD, and associated c. 20mm thick sand subbase [12].

Trench 3 (Figure 5, Section 3; Plate 3)

- 5.1.6 The earliest activity recorded in Trench 3 comprised a row of ceramic capping tiles [25] aligned north-south, encountered at a depth of c. 0.50m below present ground level. Each ceramic tile was stamped 'DANGER ELECTRICITY' and represents the capping of a disused 20th-century electricity service. The capping tiles [25] were directly overlain by a sandy silt levelling deposit [22] that was at least 0.35m thick. Cutting levelling deposit [22] was a NNE-SSW aligned service trench [21] that was at least 0.80m wide by at least 0.42m deep. The service trench contained warning tape that in turn was overlain by backfill deposits [20] & [19]. Two further services trenches [17] & [24] were recorded cutting service trench [21]. Extending across the eastern part of the trench north-south aligned service trench [17] was at least 0.30m wide by 0.16m deep. It contained three green 'CCTV' cables [53] and was backfilled with sand [18]. NW-SE aligned service Trench [24] was at least 0.50m wide by at least 0.30m deep. It contained an orange plastic duct and was backfilled with firm clayey silt [23].
- 5.1.7 The existing ground surface forming the pedestrian walkway comprised concrete paving slabs [15], recorded at a maximum height of 107.78m AOD, and associated c. 20mm thick crushed stone 'dolomite' sub-base [16].

Trench 4 (Figure 5, Section 4; Plate 4)

- 5.1.8 Located within a sample excavation at the western part of Trench 4, hazard tape was encountered for a gas main [31] at 0.63m below present ground level overlain by a c. 0.55m thick firm clayey silt levelling deposit [27]. Two NW-SE aligned modern services were recorded truncating levelling deposit [27] exposed within the north-eastern part of Trench 4 including plastic duct [30] and two green 'CCTV' cables [29]. The CCTV cables were recorded within a c. 0.30m wide service trench [28], backfilled with sand [53]. Both services were encountered at relatively shallow depths of c. 0.20m below present ground level.
- 5.1.9 The existing ground surface forming the pedestrian footway was c. 0.10m thick tarmac [26] that was encountered at a maximum height of 107.94m AOD.

Trench 5 (Figure 6, Section 5; Plate 5)

- 5.1.10 The earliest activity recorded in Trench 5 was a friable silty sand levelling deposit [37] that was at least 0.32m thick. A substantial NE-SW aligned service trench [38] was recorded truncating levelling deposit [37] and was at least 0.60m wide by at least 0.33m deep. This service trench contained three services including two rows of ceramic tiles [41] (stamped 'DANGER ELECTRICITY'), timber capping [40] and a ceramic salt glazed pipe [42]. All three services were encountered at a depth of c. 0.42m below present ground level and backfilled by weakly cemented silty sand [39].
- 5.1.11 The existing ground surface forming the pedestrian walkway comprised a combination of concrete paving slabs and red blister tactile paving [11], recorded at a maximum height of 107.64m AOD, and associated c. 50mm thick sand subbase [36]. A NE-SW aligned modern

service trench [34] was recorded cutting the sand sub-base [36] and was at least 0.26m wide by at least 0.12m deep. It contained at least two orange plastic ducts [35] and was backfilled by friable sandy silt [33].

Trench 6 (Figure 6, Section 6; Plate 6)

- 5.1.12 Four similarly WNW-ESE aligned services were recorded extending across Trench 6 including a plastic duct [46], ceramic salt glazed pipe [47], iron pipe [48] and timber capping [49]. The depths that these services were encountered ranged from 0.30m to 0.39m below present ground level. All services were directly overlain by a c. 0.29m thick weakly cemented sandy silt levelling deposit [45]. A WNW-ESE aligned power cable [54] was encountered c. 0.15m below present ground level. No cut for the service trench itself was observed.
- 5.1.13 The existing ground surface forming the pedestrian footway comprised concrete paving slabs [43], recorded at a maximum height of 107.92m AOD, and associated c. 60mm thick sand sub-base [44].

6. DISCUSSION

- 6.1 Features and deposits encountered during the archaeological evaluation have been assigned to a single phase (Phase 1) representing 20th century to modern activity at the site.
- 6.2 Such features and deposits were encountered in all trenches (Trenches 1-6) and comprised either levelling deposits or features associated with services.
- 6.3 The primary aim of the archaeological work was to identify whether the proposed Westgate Road/ Brighton Grove Junction Improvements would impact upon any in-situ remains of Hadrian's Wall. To this end no evidence for Roman activity was recorded in any of the trenches. Specifically, no evidence to elucidate the position of any element of Hadrian's Wall frontier was encountered.
- 6.4 The results of the archaeological evaluation indicate that any groundworks associated with the proposed Westgate Road and Brighton Grove Junction Improvement scheme, down to the maximum proposed depth of c. 550mm within the footways, will not impact upon any archaeological remains of significance.

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7.2 Online Sources

The **British Geological Survey** website: www.bgs.ac.uk. This was consulted for information regarding the geology of the study area.

8. ACKNOWLEDGEMENTS AND CREDITS

Acknowledgements

Pre-Construct Archaeology would like to thank Newcastle City Council for commissioning the archaeological evaluation herein described. The role of Claire MacRae, the Tyne and Wear Archaeology Officer is acknowledged.

The roles of Liam Rutherford (Engineer, Newcastle City Council) and Matt Rance (Technical Services, Newcastle City Council) are acknowledged.

PCA Credits

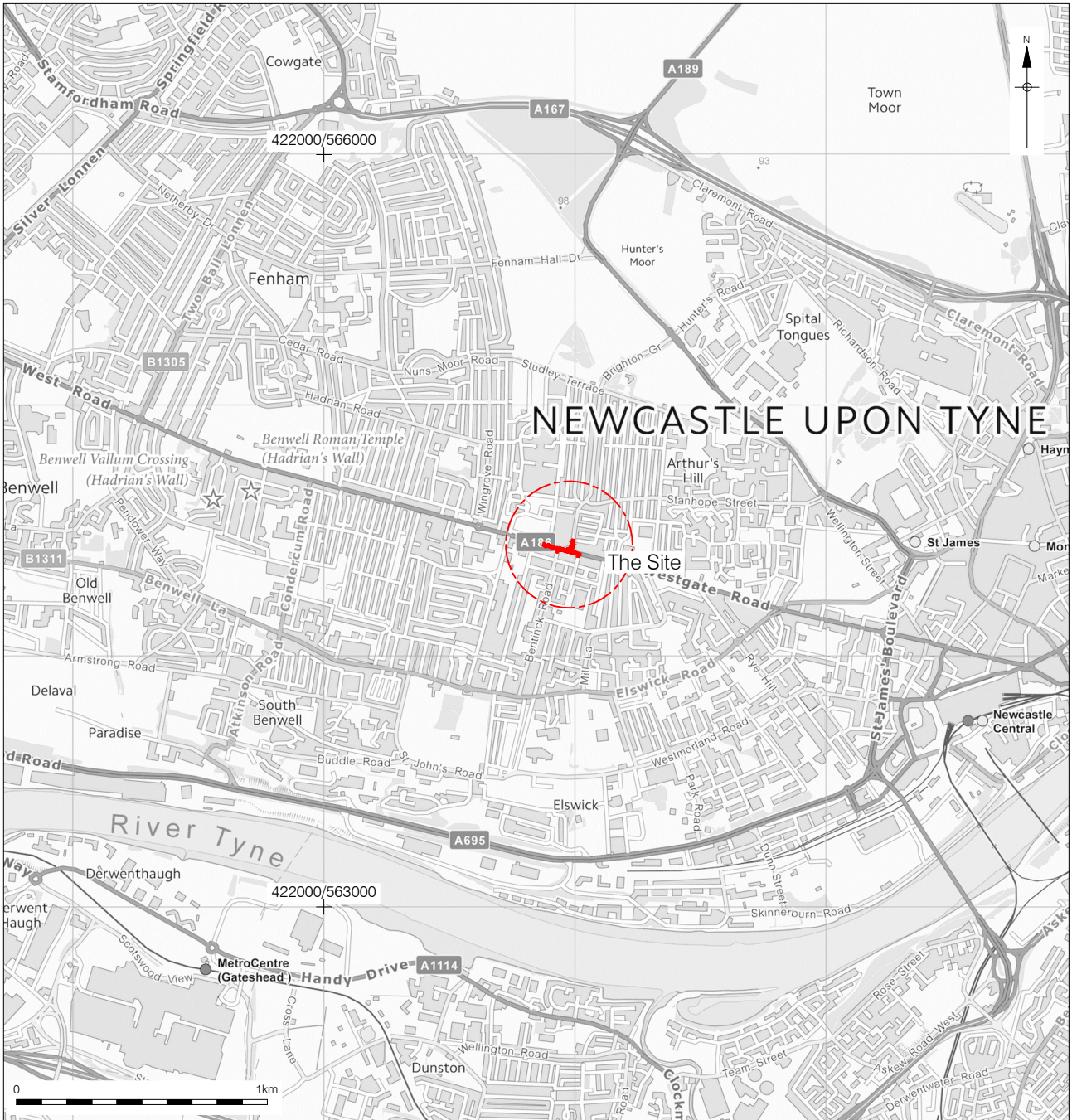
Fieldwork: Aaron Goode (Supervisor) and Kris Kristiansen

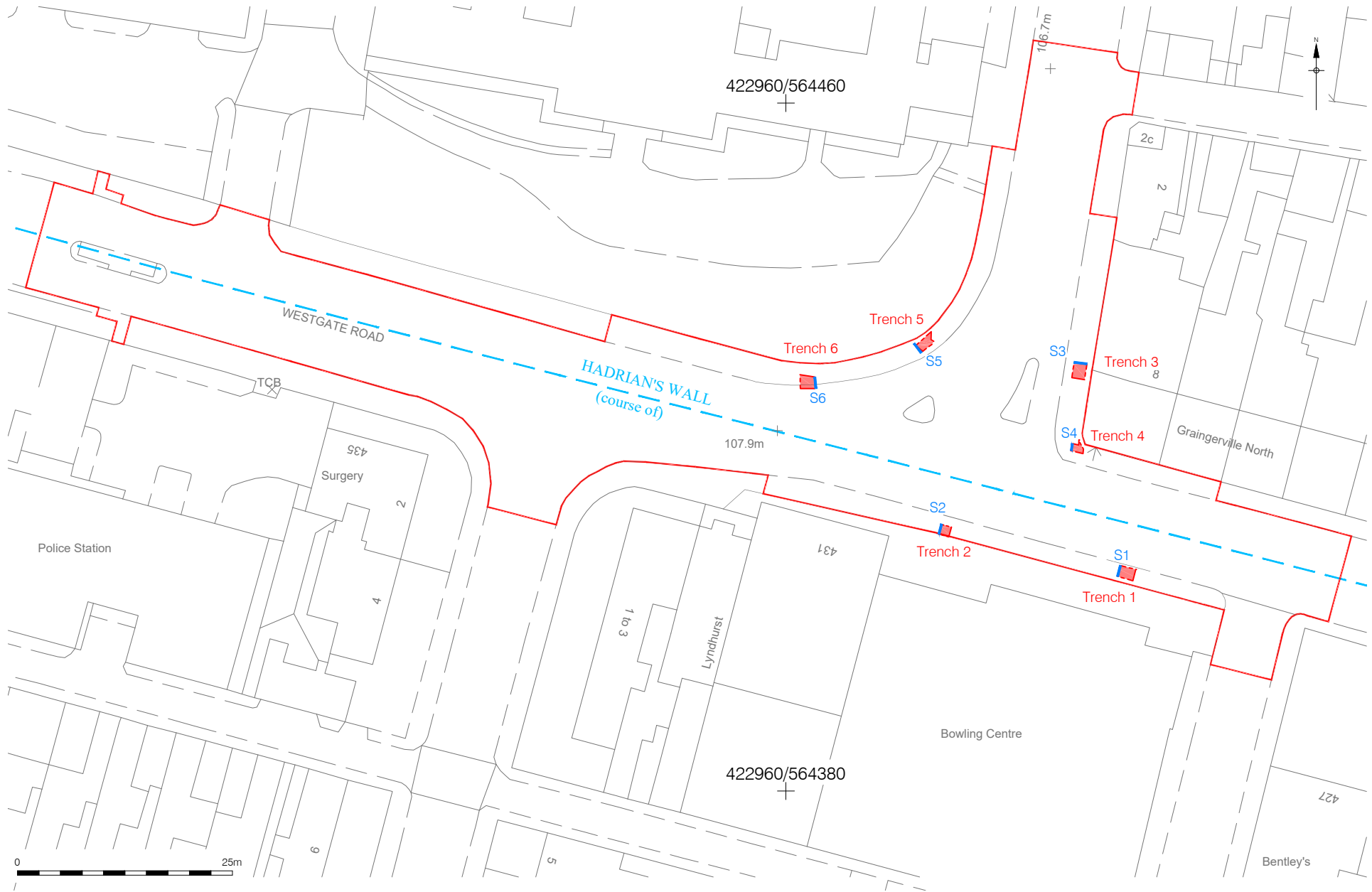
Report: Aaron Goode

Project Manager: Jennifer Proctor

CAD: Anna Tonelli

APPENDIX 1: FIGURES

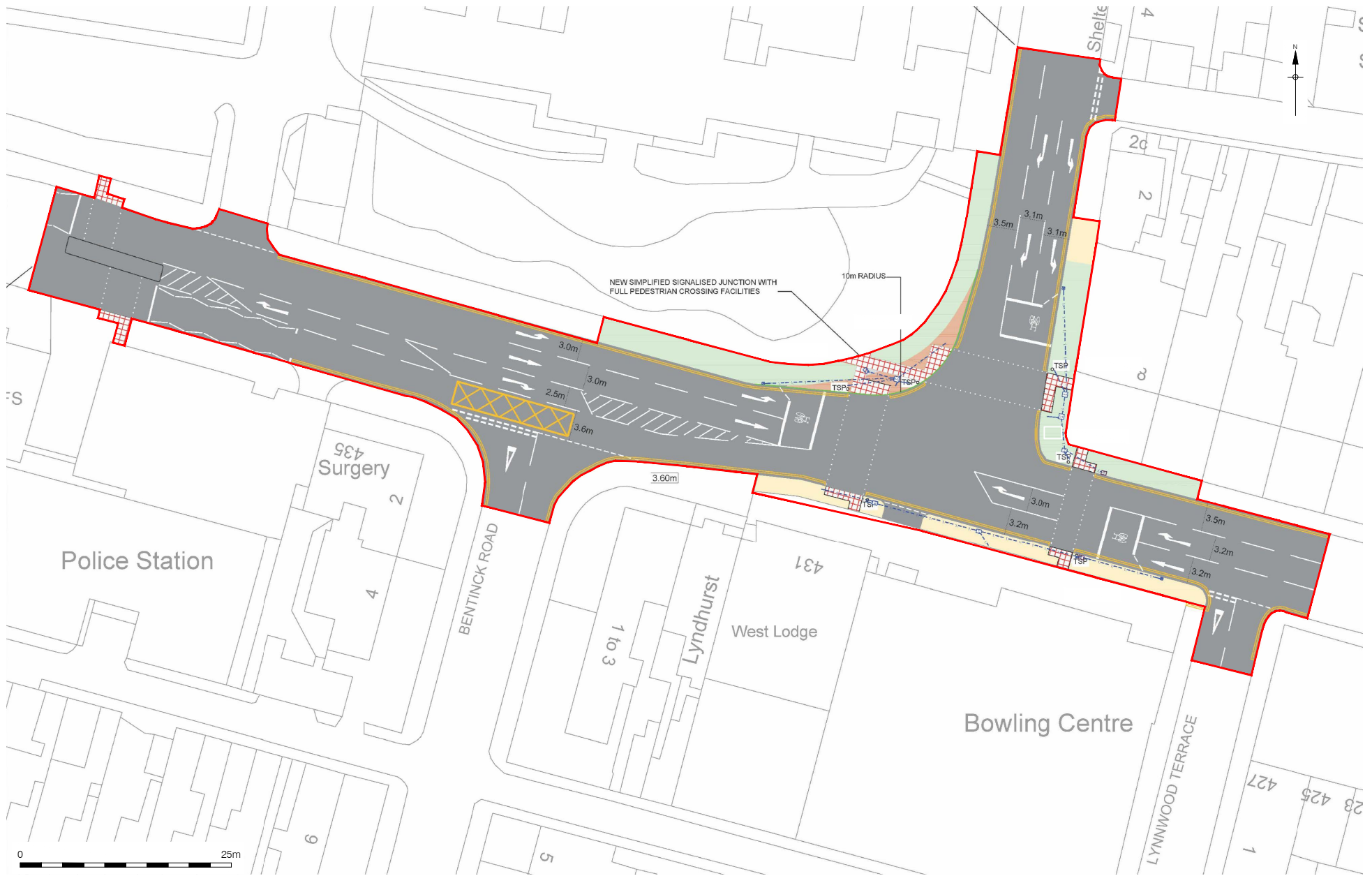




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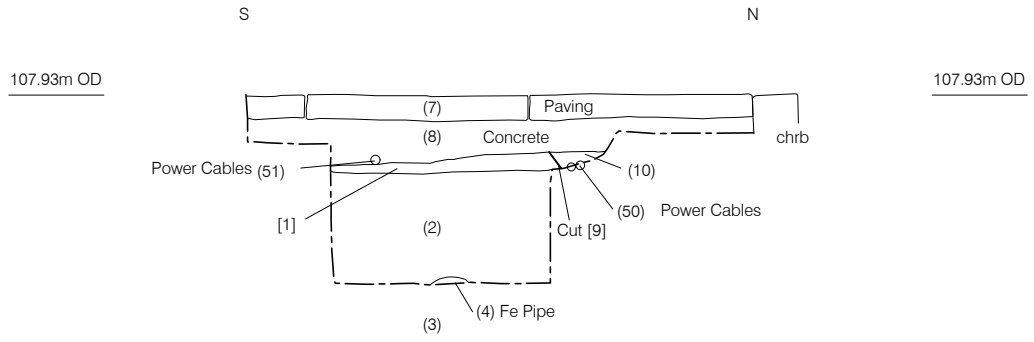
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12/03/18 AT

Figure 2
Trench Location
1:625 at A4

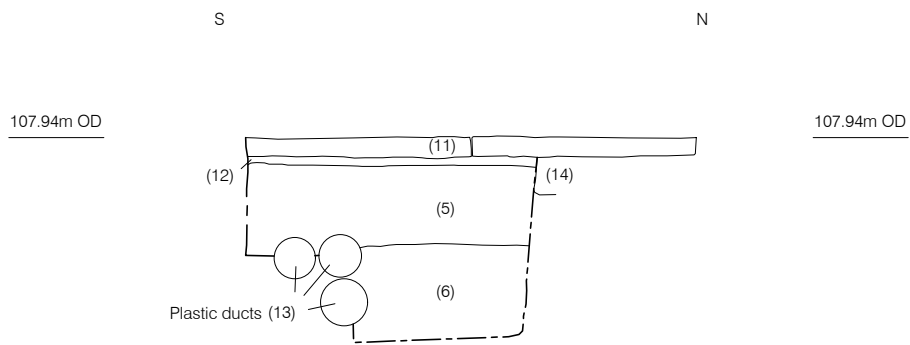


Proposed Layout based on drawing no. 17013-08/02 Rev.A. Supplied by Newcastle City Council
 © Pre-Construct Archaeology Ltd 2018
 12/03/18 AT

Figure 3
 Proposed Westgate Road Brighton Junction Improvements
 1:625 at A4

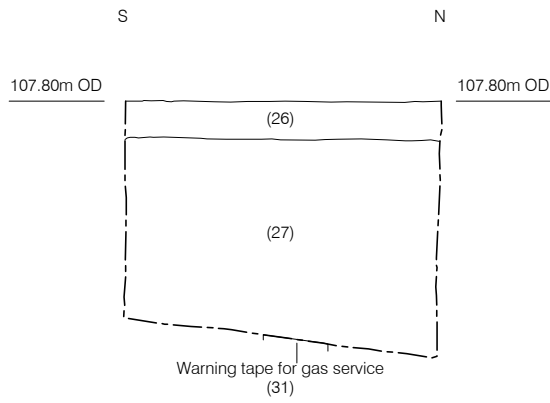
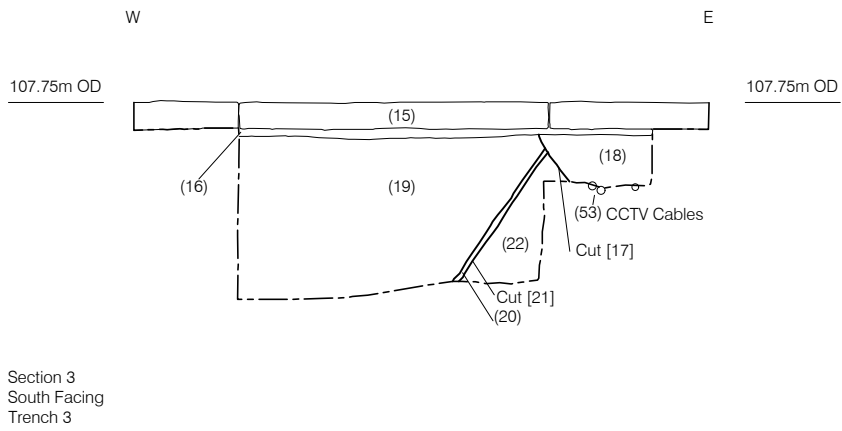


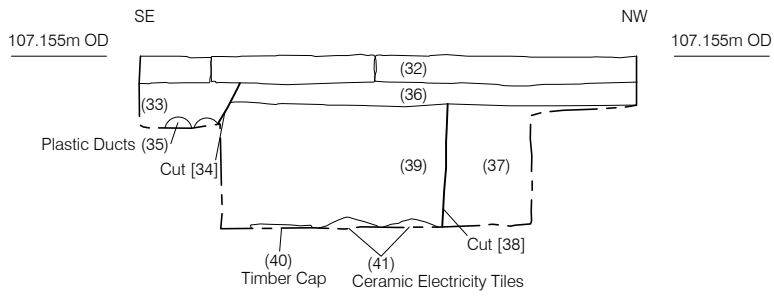
Section 1
East Facing
Trench 1



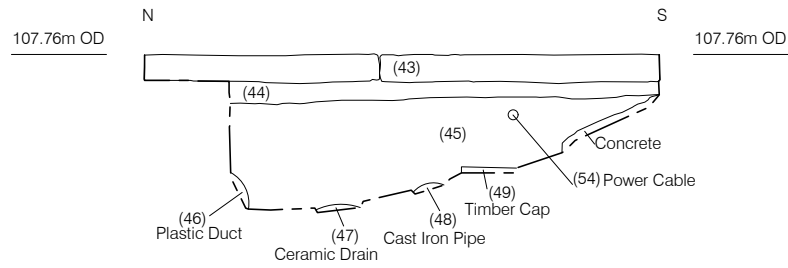
Section 2
East Facing
Trench 2







Section 5
North East Facing
Trench 5



Section 6
West Facing
Trench 6



APPENDIX 2: CONTEXT INDEX

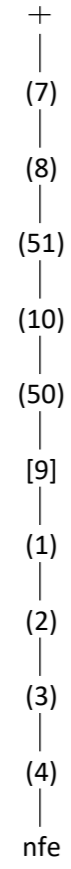
Context	Type 1	Type 2	Fill of	Interpretation
Trench 1				
1	Deposit	Layer	-	Levelling
2	Deposit	Layer	-	Levelling
3	Deposit	Layer	-	Levelling
4	Structure	Pipe	-	Iron pipe
7	Structure	Surface	-	Concrete paving slabs
8	Deposit	Layer	-	Concrete sub-base for surface (7)
9	Cut	Linear	-	Service trench
10	Deposit	Fill	[9]	Backfill of service trench [9]
50	Structure	Cable	[9]	Power cables
51	Structure	Cable	-	Power cable
Trench 2				
5	Deposit	Layer	-	Levelling
6	Deposit	Layer	-	Levelling
11	Structure	Surface	-	Concrete paving slabs
12	Deposit	Layer	-	Sand sub-base for surface (11)
13	Structure	Pipe	-	Three orange plastic ducts
14	Structure	Foundation	-	Concrete foundation for traffic camera location
52	Structure	Cable	-	Power cables
Trench 3				
15	Structure	Surface	-	Concrete paving slabs
16	Deposit	Layer	-	Crushed stone sub-base for surface (15)
17	Cut	Linear	-	Service trench
18	Deposit	Fill	[17]	Backfill of service trench [17]
19	Deposit	Fill	[21]	Backfill of service trench [21]
20	Deposit	Fill	[21]	Backfill of service trench [21]
21	Cut	Linear	-	Service trench
22	Deposit	Layer	-	Levelling
23	Deposit	Fill	[24]	Backfill of service trench [24]
24	Cut	Linear	-	Service trench
25	Structure	Tiles	-	Ceramic tiles for disused electricity services
53	Structure	Cable	[17]	CCTV cables
Trench 4				
26	Structure	Surface	-	Tarmac surface
27	Deposit	Layer	-	Levelling
28	Cut	Linear	-	Service trench
29	Deposit	Fill	[28]	Backfill of service trench [28]
30	Structure	Pipe	-	Plastic duct
31	Structure	Pipe	-	Gas service
Trench 5				
32	Structure	Surface	-	Concrete paving slabs
33	Deposit	Fill	[34]	Backfill of service trench [34]

34	Cut	Linear	-	Service trench
35	Structure	Pipe	[34]	Plastic ducts
36	Deposit	Layer	-	Sand sub-base for surface (32)
37	Deposit	Layer	-	Levelling
38	Cut	Linear	-	Service trench
39	Deposit	Fill	[38]	Backfill of service trench [38]
40	Structure	Timber	[38]	Timber capping for services
41	Structure	Ceramic	[38]	Ceramic tiles
42	Structure	Pipe	[38]	Ceramic salt glazed pipe
Trench 6				
43	Structure	Surface	-	Concrete paving slabs
44	Deposit	Layer	-	Sand sub-base for surface (43)
45	Deposit	Layer	-	Levelling
46	Structure	Pipe	-	Plastic duct
47	Structure	Pipe	-	Ceramic salt glazed pipe
48	Structure	Pipe	-	Iron pipe
49	Structure	Timber	-	Timber capping for services
54	Structure	Cable	-	Power cable

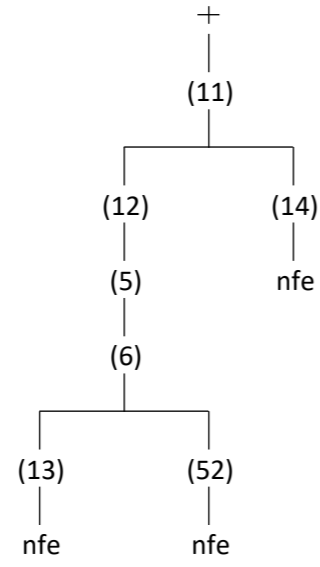
WRN18: Westgate Road, Newcastle upon Tyne, Tyne and Wear

Phase 1: Modern

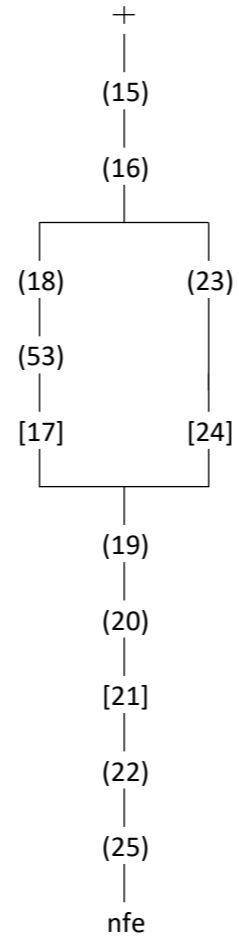
Trench 1



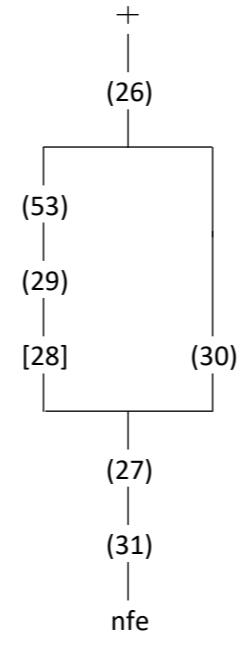
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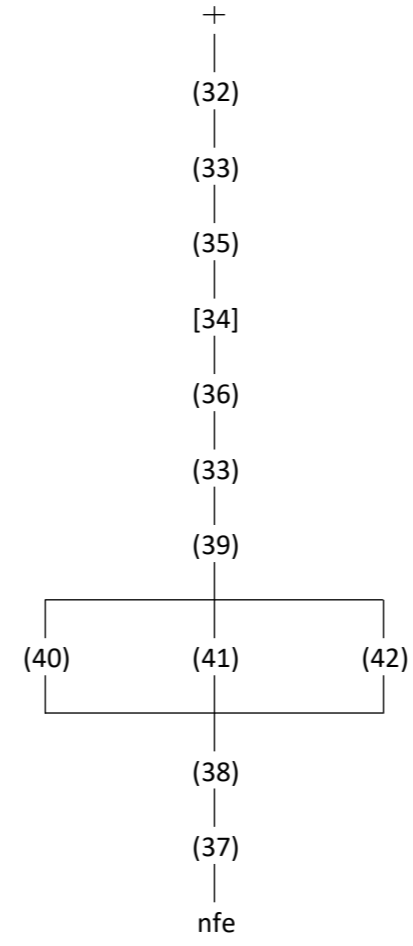
Trench 3



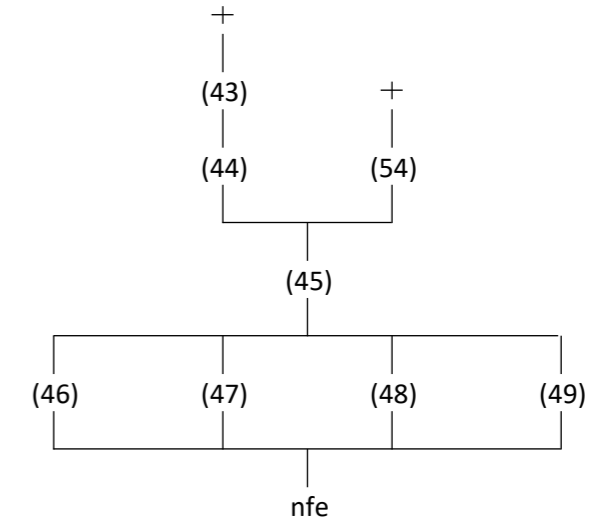
Trench 4



Trench 5



Trench 6



APPENDIX 4: PHOTOGRAPHIC PLATES

Plate 1: Trench 1 general view, west direction of view, 1m scale



Plate 2: Trench general view, west direction of view, 1m scale



Plate 3: Trench 3, general view, north direction of view, 1m scale



Plate 4: Trench 4 general view, NW direction of view, 1m scale



Plate 5: Trench 5 general view, SW direction of view, 1m scale



Plate 6: Trench 6 general view, east direction of view, 1m scale



Tyne and Wear Archaeology Service

Specification for Preliminary Archaeological Evaluation at Westgate Road

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Date: November 2017

Reference Number: MON15526

The Tyne and Wear Archaeology Service is the curatorial service for archaeology and industrial archaeology 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 Service can be found at the Planning department of

Introduction

Site grid reference: NZ 2298 6440

Newcastle City Council are proposing resurfacing, kerb works and traffic signal works on Westgate Road, Newcastle upon Tyne.

This area of Hadrian's Wall is not a Scheduled Monument. Depth of excavation for cables relating to traffic signals will be 550mm. Due to the depth, location and length of the proposed excavations a series of trial pits are required to attempt to identify whether the proposals will impact upon any in-situ remains of Hadrian's Wall. Following the trial excavations a watching brief will be required.

Previous archaeological watching briefs in this area were related to the installation of streetlights. No firm evidence of Hadrian's Wall was noted although conditions were difficult.

Research Aims and Objectives

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

'Shared Visions: The North-East Regional Research Framework for the Historic Environment' by David Petts with Christopher 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.

'Frontiers of Knowledge' edited by Matthew FA Symonds and David JP Mason 2010 is the Research Framework for Hadrian's Wall, part of the Frontiers of the Roman Empire World Heritage Site. The aim of the publication is to assess the existing knowledge base for our understanding of the monument, to identify and prioritise key themes for future research and to set out a strategy and action plan by which the initial set of objectives might be achieved.

For the Historic England Research Agenda see

<https://historicengland.org.uk/images-books/publications/eh-research-agenda/>

Where appropriate note any similar nationwide projects using ADS, internet search engines, ALSF website, HEEP website, OASIS, NMR excavation index.

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

Methods statement

6 evaluation trial pits are needed to inform the Planning Authority 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 HER, and it must contain recommendations for any further archaeological work needed on this site.

The commissioning client needs to be aware that the purpose of the preliminary evaluation is merely to ascertain if archaeological remains survive on this site and if they do, to determine their broad date, nature and function. Where archaeological remains are found in the preliminary trenches, and if these remains are at threat by the proposed development, further archaeological excavation and or a watching brief will be required before and during development work.

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 Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide, Project Planning Notes and Technical Guides 2006.

All work must be carried out in compliance with the codes of practice of the Chartered Institute for Archaeologists and must follow the [Cifa](#) Standard and Guidance for Archaeological Field Evaluations, Excavation or Watching Briefs as appropriate.

Notification

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

PROJECT INITIATION

PROJECT DESIGN

Because this is a detailed specification, the Tyne and Wear Archaeology Officer does **not** require a Project Design from the appointed archaeologist. The appointed archaeologist is expected 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.

See appendix 1 for more information.

PROJECT EXECUTION

1) Archaeological evaluation

The trenches are shown on the accompanying plan. The dimensions of the trenches are 1.5m x 1.5m in plan **at base**.

Trench locations can be adjusted to avoid services or for practical or safety purposes.

The appointed archaeologist **must** be able to get into the trench to plan, photograph and sample excavate any archaeological features which are found. In order to do this safely, where archaeological features lie over 1.2m below present ground level, trenches **must** be widened (if feasible) to allow safe access, otherwise shoring will be required.

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

The trenches should be excavated to the depth of natural subsoil or the depth of required excavation (550mm).

Trenches must avoid known services.

Trenches must stay a safe distance away from pylons and overhead power lines.

Tasks

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

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

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

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

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

Environmental sampling (and where relevant scientific dating) are compulsory parts of the evaluation exercise. All tenders will give a price for the assessment,

0 30 m



107.9m

8

431

Lyndhurst

West Lodge

1 to 3

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 the best practice documents outlined below, and follows the Government advice within the National Planning Policy Framework that developers “should recognise that heritage assets are an irreplaceable resource and conserve them in a manner appropriate to their significance” (Department for Communities and Local Government 2012, 30).

Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Don O’Meara, Historic England Regional Advisor for Archaeological Science (don.o'meara@historicengland.org.uk) **before** the evaluation begins. See Appendix 3 for more information.

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 10 megapixels or more.

For maximum flexibility digital Single Lens Reflex cameras offer the best solution for power users. 10 megapixels should be considered a minimum requirement.

When photographing with digital SLR cameras, there is often a magnifying effect due to smaller sensor sizes.

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

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

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

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

Post photography processing:

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

Post photography processing workflow for RAW images:

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

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

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

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

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

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

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

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

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

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

For more guidance on digital photography:

Digital Imaging Capture and File Storage (Historic England 2015c)

Understanding Historic Buildings – A guide to good recording practice (Historic England 2016b, 17-21).

Archaeological Archives – A guide to best practice in creation, compilation, transfer and curation (Brown 2011, 2nd Edition)

IFA, Guidance on the use and preservation of digital photographs

FISH (Forum on Information Standards in Heritage), September 2006 v.1, A Six Step Guide to Digital Preservation, FISH Fact Sheet No. 1

Visual Arts Data Service and Technical Advisory Service for Images, Creating Digital Resources for the Visual Arts: Standards and Good Practice

AHDS Guides to Good Practice – Julian Richards and Damian Robinson (eds), Digital Archives from Excavation and Fieldwork: Guide to Good Practice, Second Edition

Printing the images:

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

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

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

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

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

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

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

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

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

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

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. Recent Historic England guidance “Drawing for Understanding” should be consulted to advise on recommended format presentations for such work (Historic England 2016a, 35-57).

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

Finds shall be recorded and processed in accordance with the ClfA Guidelines for Finds Work (2008).

Finds will be assessed by an experienced finds specialist. Specifically, the finds assessment will refer to analogous finds, or assemblages of similar material, from the Tyne and Wear and North-East region.

The most relevant Historic England guidance for finds treatment are ‘Investigative Conservation’, (English Heritage 2008a), Waterlogged Organic Artefacts (English Heritage 2012), and “Waterlogged Wood” (English Heritage 2010).

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). Refer to “Guidelines on the x-radiography of archaeological metalwork, English Heritage, 2006.

Brick (including all ceramic building material) dimensions will be measured, a note made of the bonding material, and any other pertinent details such as makers stamps.

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

In some cases provision must also be made for the scientific analysis of artefacts. This can include, but not be limited to:

1. Pottery: Luminescence dating (English Heritage 2008b), lipid analysis, thin section analysis, ICPS (Inductively-coupled plasma spectroscopy)
2. Ceramics (brick, tile, structural ceramics): Luminescence dating (English Heritage 2008b)
3. Metal objects: XRF analysis, x-raying of finds (English Heritage 2006).

Advice can be sought from Don O’Meara of Historic England where necessary. It is advisable to discuss potential scientific analysis at all stages of the project to allow for clear planning and understanding between the contractor, the client, and the local authority archaeologist.

All objects must be stored in appropriate materials and conditions to ensure minimal deterioration. Advice can be sought from Don O’Meara of Historic England 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 field-work**, for the Client and the Planning Authority, with a copy for information to the County Archaeologist. This will contain the recommendations for any further work needed on site.

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

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

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

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

- 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
- one for deposition in the County HER at the address below. This CD will also include all of the digital images as TIFFs and the accompanying metadata.
- one for Mike Collins, Historic England's Hadrian's Wall Archaeologist (Bessie Surtees House, 41-44 Sandhill, Newcastle upon Tyne NE1 3JF)

The report and CD for the HER must be sent by the archaeological consultant or their client directly to the address below. If the report is sent via the planning department, every page of the report will be stamped with the planning application number which ruins the illustrations. The HER is also often sent a photocopy instead of a bound colour original which is unacceptable.

Publication

If significant archaeological features are found during the evaluation, the results may also warrant publication in a suitable archaeological journal. The tender should therefore include an estimated figure for the production of a short paper of, for example 20 pages, in a journal such as *Archaeologia Aeliana* (charge per page is around £50), the *Arbeia Journal*, *Industrial Archaeology Review* or *Durham Archaeological Journal* (charge per page is £25). This is merely to give the commissioning client an indication of potential costs.

The editor will **not** publish the archive report as-is. The findings must be re-written, edited and enhanced, where necessary, with further research, to produce a format which is suitable for the readers of the journal and which meets the requirements of the editor. Most journals peer-review papers prior to publication.

Before preparing a paper for publication, the archaeological contractor must discuss the scope, length and suitable journal with the County Archaeology Officer. The appointed archaeologist will then be expected to send a publication proposal to the editor of the journal. Once the editor has agreed in principle to publish the paper, work can commence on the paper itself.

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:

- “Archaeological Archives – A guide to best practice in creation, compilation, transfer and curation” (Brown 2011)
- “Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives” (ClfA 2014)
- Great North Museum: Hancock Archive Deposition Policy

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. It is advisable to seek advice from a specialist, or the Historic England Regional Science Advisor on the retention policy for large volumes of material, such as slag remains. Advice should be sought on the retention of a suitable subsample of material (rather than 100% retention) as per Historic England recommendations.

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 (Great North Museum: Hancock or Tyne and Wear Museums).

Contact Keeper of Archaeology, Andrew Parkin at the Great North Museum (0191 2088867). andrew.parkin@newcastle.ac.uk

The Great North Museum: Hancock charges a fee for archive deposition. Please see the GNM Archive Deposition Policy for details. This policy also sets out how they expect the finds, papers and photographs to be packaged.

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

Digital Archive

Copy of the report on CD as a pdf plus all of the digital images as TIFFs.

See MoRPHE Technical Guide 1 – Digital Archiving & Digital Dissemination 2006.

Archaeology Data Service

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

Archaeology Data Service
Department of Archaeology
University of York

King's Manor
York
YO1 7EP
01904 433 954

Web: <http://ads.ahds.ac.uk>

SIGNPOSTING

OASIS

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

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

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

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

Please ensure that you and 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 National Monuments Record (tel. 01793 414600 or oasis@english-heritage.org.uk). For enquiries of a technical nature please contact: Louisa Matthews at the Archaeology Data Service (tel. 01904 433954 or oasis@ads.ahds.ac.uk). Or contact the Tyne and Wear Archaeology Officer.

The tender

Tenders for the work should contain the following:-

1. Brief details of the staff employed and their relevant experience
2. Details of any sub-contractors employed
3. 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.
 - * Post-excavation costs
 - * Cost of Environmental analysis and scientific dating per sample

- * Cost of depositing the archive
 - * Estimated cost for full publication of results in an archaeological journal
 - * Overheads
4. An indication of the required notification period (from agreement to start date) for the field-work; the duration of fieldwork and the expected date for completion of the post-excavation work (a maximum of 6 months after completion of the fieldwork)

APPENDICES

- 1 Health and safety and insurance
- 2 Ecology and biodiversity
- 3 Environmental sampling and scientific analysis
- 4 Scientific Dating
- 5 Specific types of sampling
- 6 Animal bone
- 7 Human remains
- 8 Treasure

APPENDIX ONE

HEALTH AND SAFETY AND INSURANCE

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 Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide 2016 contains general guidance on Risk management (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 & Employers) formerly SCAUM (Standing Conference on Archaeological Unit Managers) Health and Safety Manual www.famearchaeology.co.uk

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

Other potentially applicable legislation:

Working at Heights Regulations 2005, Manual Handling 1992

'Safe use of ladders and stepladders: An employers' guide' HSE Books 2005

Some archaeological work (such as those that are scheduled to last more than 30 days and have more than 20 workers working simultaneously at any point in the project, or exceed 500 person days) may be deemed notifiable projects under Construction Design and Management Regulations 2015.

Where C.D.M Regs apply, the HSE must be notified before work begins.

<http://www.legislation.gov.uk/ukxi/2015/51/contents/made>

Detailed information on hazards and how to carry out a risk assessment can be obtained from the Health and Safety Executive (www.hse.gov.uk) and the local authority health and safety department.

Specific guidance for land contamination and archaeology can be obtained from the Institute for Archaeologists (www.archaeologists.net), the Construction Industry

Research and Information Association (www.contaminated-land.org) and the Association of Geotechnical and Geoenvironmental Specialists (www.ags.org.uk).

See also the joint English Heritage and Environment Agency document “Guidance on Assessing the Risk Posed by Land Contamination and its Remediation on Archaeological Resource Management” (English Heritage and 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’s structural engineers concerning working in close proximity to the foundations of the surrounding buildings.

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 the digging 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.

APPENDIX TWO

ECOLOGY AND BIODIVERSITY

The commissioning client will advise of any ecological or biodiversity issues which need to be taken into consideration, such as

- the presence of Japanese Knotweed (see below), Himalayan Balsam and Giant Hogweed (invasive plants which must not be disturbed by digging)
- The presence of Dingy Skipper Butterflies, Great Crested Newts, Slow Worms, Adder and Common Lizards
- The presence of species rich grasslands
- Ground nesting birds may be present in nesting season (March to August)
- Designated sites – Local Wildlife Sites, Sites of Local Conservation Interest and Sites of Special Scientific Interest
- The presence of protected trees or trees which are to be retained within the development (see below)

Japanese Knotweed, Himalayan Balsam, Giant Hogweed

Trenches must avoid these plants (it is the commissioning client's responsibility to advise their archaeologist if they are present on the site).

Japanese knotweed was introduced into Britain in the 19th century as an ornamental plant. Over time it has become widespread in a range of habitats, including roadsides, riverbanks and derelict buildings. It out-competes native plants and animals and is now classed as an invasive species. It spreads through its crown, rhizome (underground stem) and stem segments, rather than its seeds. The weed can grow a metre in a month and can grow through concrete and tarmac, damaging buildings and roads. Studies have shown that a 1cm section of rhizome can produce a new plant in 10 days. Rhizome segments can remain dormant in soil for twenty years before producing new plants.

In the UK there are two main pieces of legislation that cover Japanese Knotweed. These are:

Wildlife and Countryside Act 1981

Listed under Schedule 9, Section 14 of the Act, it is an offence to plant or otherwise cause the species to grow in the wild. This lists over 30 plants including Japanese knotweed, giant hogweed and parrot's feather. An offence under the Wildlife and Countryside Act can result in a criminal prosecution.

Environmental Protection Act 1990

Japanese Knotweed is classed as 'controlled waste' and as such must be disposed of safely at a licensed landfill site according to the Environmental Protection Act (Duty of Care) Regulations 1991. Soil containing rhizome material can be regarded as contaminated and, if taken off a site, must be disposed of at a suitably licensed landfill site and buried to a depth of at least 5 m. An infringement under the Environmental Protection Act can result in enforcement action being taken by the Environment Agency which can result in an unlimited fine. You can also be held liable for costs incurred from the spread of Knotweed into adjacent properties and for the disposal of infested soil off site during development which later leads to the spread of Knotweed onto another site.

See also the Environment Agency 'Japanese Knotweed Code of Practice'.

It's down to landowners to control these plants, but they don't have to remove them. However, causing the plants to spread by removing or disposing of them incorrectly [i.e. disturbing them through archaeological excavation] would be illegal {info taken from www.environment-agency.gov.uk and www.devon.gov.uk}.

Trees

The commissioning client will advise their appointed archaeologist of any protected trees which must be avoided by the evaluation. Damage to trees covered by a Tree Protection Order carries a substantial fine. Where there are protected trees within a site, or unprotected trees which are to be retained within a development, the developer's arboriculturalist must install Herras fencing before the evaluation begins to protect the root protection areas (which may be larger than the canopy of the tree) in accordance with BS5837:2012. The local authority landscape and ecology officer may wish to visit the site to check that the fencing has been erected in the right place.

APPENDIX THREE

ENVIRONMENTAL SAMPLING AND SCIENTIFIC ANALYSIS

This is a compulsory part of the archaeological work.

The environmental remains are identified as an element of the historic record as important as the physical remains of buildings, or of manmade artefacts. In this way the adequate recognition of the importance of these remains on an archaeological site is as important as the other elements of the recording process. It is also acknowledged that the manner in which this is applied to commercial or research projects needs to be undertaken in the spirit of the government National Planning Policy Framework and be: relevant, proportionate and fit for purpose. This balances the needs of development, with a consideration of the importance of the archaeological remains in the context of the historic environment more generally.

Aims of environmental sampling: to determine the nature, presence or absence of environmental material, and to determine the abundance and concentration of this material. It is then to interpret these elements within the overall context of the archaeological remains. The questions that can be asked of these remains are often site or period specific and analysis should consider regional research frameworks, and regional reviews of environmental evidence when interpreting remains.

Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Don O'Meara, Historic England Advisor for Archaeological Science (don.o'meara@historicengland.org.uk) **before** the evaluation begins. The sampling strategy should include a reasoned justification for selection of deposits for sampling and in this way contacting the Science Advisor allows a clear and proportionate plan to be agreed at an early stage.

The primary document to consider when undertaking environmental sampling is the Historic England guidance 'Environmental Archaeology: A guide to the theory and practice of methods, from sampling and recovery to post excavation' (English Heritage 2011b), though a number of supplementary documents (detailed below) provide further detailed advice.

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 environmental 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.

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.

Types of sample

Before work commences the contractor should detail the types of material they intend to sample for and why, as well as the material they will not be sampling for. This will largely be determined by local preservation conditions and can be determined by consulting the best practice guidelines (English Heritage 2011, 6-8).

Therefore consideration should be given to issues such as:

1. Is there likely to be waterlogging on the site e.g. near Newcastle-Gateshead Quayside, within the urban centre, on sites with deep stratigraphy
2. Is the site on an acidic or basic drift geology; this will affect the preservation of material such as pollen, molluscs, animal and human bone

Bulk samples for flotation

These 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 geological sieve used to capture the flot/washover should be 0.25-0.3mm. The residue sieve size should be 0.5-1mm.

Waterlogged Samples:

These samples contain a high proportion of organic material and are more typically recovered during urban excavations, though consideration must also be given that deep features on any archaeological site may show evidence of waterlogging. These samples are typically smaller than those for bulk flotation, but must also be processed using specialist methods.

Coarse-sieved samples:

These 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 as to when this sort of sampling may be appropriate.

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

Aims and objectives

The primary objective of environmental archaeology is to inform the archaeologist further on aspects of the site by either supporting the conclusions made on-site, or suggesting new aspects which can be considered when the environmental remains are analysed. The aim is to present this in a format which can be interpreted by the client, and other stakeholders in the project (Local Authority, Historic England, other researchers). Finally, the role of the post-excavation work is to archive pertinent remains to allow for the potential of future scientific work and analysis. In this manner the environmental archaeology allows the developer to adequately address the guidelines for heritage assets as set out in the National Planning Policy Framework where it outlines that local authorities “should also require developers to record and advance understanding of the significance of any heritage

assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible” (NPPF 2012, paragraph 141).

All tenders will give a price for the assessment, full analysis, report production and publication per sample.

As a standard the full sample must be assessed by the laboratory, not just a small sub-sample, e.g. 10 litres of a 40 litre sample. This acknowledges that the sample is itself only a small part of a greater whole, and to only process a small portion of the sample would be to subsample the archaeological feature further (English Heritage 2011, 33). Alterations to this advice can be discussed with either the County Archaeologist or the Regional Science advisor in the context of the overall project aims.

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.

A range of features, and all phases of activity, need to be sampled for charred plant remains and charcoal. Ceramic 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.

Historic England guidelines encourage question driven archaeological research, and therefore if you feel alternative sampling or analysis would be better applied to an archaeological site this can be discussed with the Historic England Regional Science Advisor.

APPENDIX FOUR

SCIENTIFIC DATING

This is a compulsory part of the archaeological work, where it is relevant.

Deposits will be assessed for their potential for radiocarbon, archaeomagnetic and luminescence dating. Guidelines have been produced for a number of these techniques such as Archaeomagnetic Dating (English Heritage 2006a), Luminescence dating (English Heritage 2008b), and Dendrochronology (English Heritage 1998).

For large excavations, particularly of prehistoric sites, a specialist scientific dating consultant must be part of the post-excavation assessment team. The need for this provision will be discussed with the client, county archaeologist, and the contractor during the excavation phase when the size and significance of the remains are fully revealed. They will ensure that money set aside for dating is well spent, that the most appropriate samples are submitted for dating, that the right number of samples are submitted for dating. The Historic England Science Advisor for the North-East, as well as the Historic England Scientific Dating team can provide contact details for scientific dating experts (contact Alex Bayliss Alex.Bayliss@historicengland.org.uk).

APPENDIX FIVE

SPECIFIC TYPES OF SAMPLES

Pollen

Pollen samples can be taken from features such as lakes, ponds, palaeochannels, estuaries, saltmarshes, mires, alluvium and colluvium, and from waterlogged layers in wells, ditches and latrines etc. Substances such as honey, beer or food residues can be detected in vessels. Activities such as threshing, crop processing and the retting of flax can be identified. When taken on site, pollen samples should overlap. Your regional science advisor can advise on the type of corer or auger which would be most appropriate for your site. Samples need to be wrapped in clingfilm and kept dark and cool. Make a description of the sediments in which the pollen was found, and send this with the sample to be assessed.

Forams and diatoms

Coastal or estuary sites (even those which are now well drained) are suitable for sampling for foraminifera. Diatoms can also be found on marine sites, but also in urban settings (sewers, wells, drains, ditches etc). They only survive in waterlogged conditions. These aquatic microfossils are used as proxy indicators of the former aquatic ecological conditions on site, changes in sea levels and temperature, salinity, PH and pollution. Forams are taken from cores, monolith tins or bulk samples. Diatoms are cut from monolith tins or cores or taken as spot samples.

Insects

Insects, which are useful as palaeoenvironmental indicators, survive best in waterlogged deposits such as palaeochannels and wells. They can provide information on climate change and landscape reconstruction as some species are adapted to particular temperatures, habitats or even particular trees. Certain insects can indicate the function of a feature or building (eg. Weevils, which were introduced by the Romans, often indicate granary sites, parasites will indicate the presence of particular animals such as sheep or horse, latrine flies survive in the mineral deposits in latrines, or in the daub of medieval buildings etc). Samples need to be sealed (eg. in a plastic box).

Industrial Activity

Where there is evidence for industrial activity, macroscopic technological residues (such as slags) can be collected by hand. Separate samples should be collected for micro-slugs (hammer-scale and spherical droplets). Guidance should be sought from the Historic England Regional Science Adviser on the sampling strategy for industrial features and advice on cleaning and packaging. As advised in Historic England guidelines (Historic England 2015b), the potential volume of material that can be produced on such sites means a careful sampling strategy is needed to ensure only relevant volumes of pertinent material is collected. Specialist on-site advice must be sought on identification of metalworking features. Slag and metal working debris must be assessed by a specialist and depending on the significance of the remains provision should be made for adequate scientific

analysis of the remains, including chemical or physical analysis, and the x-raying of material (English Heritage 2006b; Historic England 2015b).

Specialist advice can also be sought during the creation of the site archive to ensure an adequate volume of material is retained within the archive, while also ensuring excessive amounts of material are not retained. The key guidance for these remains is 'Archaeometallurgy' (Historic England 2015b). Work at metal production sites of all periods should also consider the Historical Metallurgy Society's research framework (2008).

Other industrial processes which should be considered include glass working and pottery production as both of these industries are prominently in the history and archaeology of the Tyne and Wear region. Guidelines for identifying and analysing glass remains have been published (English Heritage 2011a), as well as guidelines for pottery production sites (Historic England 2015a). In tandem with these guidelines when working on post-medieval sites the guidance 'Science for Historic Industries: Guidelines for the investigation of 17th to 19th century industries' (English Heritage, 2006d) should be consulted.

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 Historic England guidelines "Environmental Archaeology" (English Heritage 2011) and "Geoarchaeology", (Historic England 2015d) should be followed.

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). Considerations should also be given to the Historic England Document "Waterlogged Organic Artefacts", (English Heritage 2012). If timbers are likely to be present on your site, contact a wood specialist beforehand. Pre-excavation planning will determine questions to ask, agree on a sampling strategy, allocate reasonable time and budget.

Recording of wood should follow guidelines which use standard measurements and terminology (see English Heritage 2010, 7-20) when recording plans, photographs, size and orientation of the wood (radial, tangential, transverse), toolmarks, joints, presence of bark, insect damage, recent breaks, and relationship to other wood or timbers from the site.

Both vertical and horizontal positioning of wood 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, "Dendrochronology" (English Heritage 2004).

Leather and organic materials

Waterlogged organic materials should be dealt with following recommendations: "Waterlogged Organic Artefacts – Guidelines on their Recovery, Analysis and Conservation", (English Heritage 2012). It should be noted that the earlier publication "Guidelines for the care of waterlogged archaeological leather", (English Heritage and Archaeological Leather Group 1995), has been superseded by the English Heritage 2012 guidance.

Glass

As glass-making furnaces are above ground structures, they rarely survive. However sample residues can produce glass fragments which define glass working even though no traces of furnaces survive.

Excavations at Whitby Abbey recovered glassworking waste from preliminary sampling. Targeted bulk sampling in subsequent years recovered more evidence for glass working. Raw glass, twisted rods of glass and a possible glass inlay for an illustrated book were found. Similar glass rods were found at St. Gregory's Minster at Kirkdale, North Yorkshire.

Specialist analysis can reveal the origin of the raw materials, recycling of glass, glass working technology, and origins of imported glass. Local examples of the potential of glass analysis can be seen in material analysed from the Roman excavations at Binchester, Co. Durham (Paynter 2004), as well as window glass examined from Belsay House, Northumberland (Dungworth and Harrison 2011).

APPENDIX SIX

ANIMAL BONE

The analysis of animal bones from archaeological sites has great potential to provide information on a variety of scales. These can range from the context level interpretation, to site wide, local, regional and international issues (English Heritage 2014, 3). Their analysis can explore themes such as hunting and fowling, fishing, plant use, trade networks, seasonality, diet, butchery, animal husbandry, food procurement, age structures, farrowing areas, species ratios, and local environment. However, at these varieties of scales it is recognised that the importance of the remains does not rest solely on the size of the assemblage.

Animal bone assemblages should be assessed by a recognised specialist. The purpose and scope of the assessment should be clearly outlined as per best practice guidelines (English Heritage 2014, 18). In many cases, particularly for evaluation exercises, the material may not be examined beyond the assessment stage, however the assessment must present in a clear and informative manner the pertinent information relating to the assemblage. The format outlined in Historic England guidelines (English Heritage 2014, Table 4) is presented as the standard which should be adhered to.

The specialist will need to know a brief account of the nature and history of the site, an account of the purpose, methods (details of sampling) for recovery of animal bones, and the main aims and results of the excavation, details of any specific questions that the excavator wants the animal bone specialist to consider, information about other relevant finds from the excavation (e.g. bone tools, fishing equipment, weaving equipment), specific information about each context that has produced significant quantities of animal bone (recovery method, phase, context type, position in relation to major structures, contamination by more recent material, some indication of the amount of bone (by weight or by container size)).

Fish and Bird bone

Though coming under the overall treatment of animal bone the bones of fish and birds are often rarer due to their more delicate nature, requiring higher levels of preservation. However, because of this in cases where fish bones are well preserved this should be treated with a high priority (English Heritage 2011, 30-31). Because fish bones are so small, particularly freshwater and estuarine species, they are often only recovered in large bulk samples. Samples must always be sieved with an appropriate sized sieving mesh. An example of the questions that can be asked of suitable assemblages can be seen from the material from Fenwick's Entry (Nicholson 1988).

Both the guidelines "Environmental Archaeology" (English Heritage 2011) and "Animal Bones and Archaeology" (English Heritage 2014) can be consulted for sampling of these remains. Dated assemblages of fish bones should be archived to museums for future dating and isotope analysis where this is not undertaken as part of the post-excavation process.

Rescue excavations carried out in the 1970s at the Iron Age hillfort of Broxmouth in East Lothian produced an assemblage of fish bone. Recent analysis of this

material has proved the presence of large specimens of ling and other species which suggests that the Broxmouth population carried out deep-sea fishing. It has previously been suggested that Iron Age fishing would only have been undertaken by lines from the shore. It has also been suggested that fish was not consumed in Iron Age Britain due to religious or cosmological reasons {Hannah Russ, Ian Armit, Jo McKenzie, Andrew Jones, 2012, Deep-sea fishing in the Iron Age? New evidence from Broxmouth hillfort, South-east Scotland in Environmental Archaeology, Vol 17, Number 2, pp 177-184}.

Roman agenda – did the Romans eat fish? Were they sourced locally or imported? Use of fish as a sauce (garum).

Excavations at Bridge Street, Chester showed that in the Roman period fish was eaten and was both locally sourced and imported (mullet and Spanish mackerel).
Medieval and post medieval agenda – evidence for the deep sea fishing 'revolution', size-biased collections, replacement or supplement of freshwater and estuarine fish in the diet by deep sea fish.

There was some herring exploitation in the early medieval period. Christian fasting from around 970 allowed fish to be eaten on Fridays which led to a huge demand for fish. There was an increase in marine fishing, fish trade and fish consumption (cod, haddock, ling, herring etc) around 1000 AD. Middens provide evidence of commercial fishing. There was a decline in freshwater fish (cyprinid or carp, salmon, smelt, eel, pike) from the eleventh century.

Smoking fish is a recent practice. They were previously air dried and salted.

Newcastle was a major port. Samples should be sieved to retrieve fish and bird bones along with small parts of other animal skeletons and young infused bones.

A crane bone was recovered from excavations at Tuthill Stairs, Newcastle – a rare find.

Herring bones are so small that they can only be retrieved by 2mm sieving.

Clay soils are difficult to sieve, hot water can help.

Acidic soils mean poor preservation of bone.

See English Heritage 2011, "Environmental Archaeology – a guide to the theory and practice of methods from sampling and recovery to post excavation", Centre of Archaeology Guideline 1.

Isotope analysis can determine where the fish were coming from – North Sea, Scandinavia, Newfoundland, Iceland etc.

There is an excellent reference collection of fish bone at York.

Fish bones should be archived to museums for future dating and isotope analysis where this is not undertaken as part of the post-excavation process.

APPENDIX SEVEN

HUMAN REMAINS

Human remains must be treated with care, dignity and respect. It must also be acknowledged that in archaeological terms the human skeleton is particularly 'information rich' and therefore is treated as a special archaeological deposit in its own right. Some of the potential benefits from the study of human skeletons include understanding demography, growth profiles, patterns of disease, genetic relationships, activity patterns, diet, burial practices, human evolution.

The expectations of the scope for post-excavation analysis will be discussed by the client, contractor, County Archaeologist, and the Historic England Science Advisor during all phases of the project. This will ensure all stakeholders in the project understand their responsibilities and expectations. It is important to emphasise that this includes the excavation, assessment, analysis (including scientific analysis), and long-term storage or reburial of the remains.

An important element when determining a project design is to consider the preservation conditions. Therefore, when evaluating a burial site consideration should be made as to whether waterlogging may be present at the lower stratigraphic layers. Excavators should consider carefully the implications for this based on information provided to them: DBA's, evaluation reports, geotechnical reports etc.

Excavation needs to consider whether the human remains fall under secular law, or ecclesiastical law, particularly in cases where the legal effects of consecration may have been removed from a cemetery, in the case of Christian burial grounds. If in doubt as to the status of a particular burial ground Joseph Elders of the Church of England is a point of contact of archaeological matters:
joseph.elders@churchofengland.org

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

The excavation area must be shielded from public view with screens, and all staff, including supervisors and field staff must be aware of the ethical considerations around the treatment of human remains (English Heritage 2005),

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 and cracking. This damage could lead to damage to the bone which would hinder further analysis. The remains should be excavated as completely as possible to give the osteoarchaeologist the maximum amount of data.

An osteoarchaeologist should be employed for any burial excavation from the start of the project.

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

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

Sampling strategies need to consider elements of the skeleton which might be missed during excavation. This includes:

- The area around the skull: to recover all teeth, as well as calcified cartilage around the neck, and the hyoid bone
- The area around the hands and feet: to recover smaller phalanges, as well as sesamoid bones.
- The sediment around the lower abdomen: to recover kidney stones, or gall bladder stones.

Particular care should be taken when lifting the skull and pelvis due to their importance for aging and sexing an individual. In addition, when sampling the lower abdomen it should be borne in mind that foetal bones may be present in the cases of women who died during childbirth. Where long bones (radius, ulna, humerus, femur, tibia, fibula) are observed to be particularly delicate the excavator should bag each bone separately.

In cases where waterlogging may be present the county archaeologist and the Historic England Science Advisor should be informed as waterlogging will have implications both for the recovery of artefactual material, as well as health and safety considerations.

It is important to remember that the whole assemblage of bones from the skeleton is important for a holistic examination of age, sex, disease, diet etc. Therefore though a number of key bones are used for the main points of analysis, the excavator must consider that different bones impart different types of information.

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

Site inspection by a recognised osteoarchaeologist 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 Bones from Archaeological Sites (English Heritage 2004). In the event of destructive analysis being undertaken the Historic Guidance 'Science and the Dead' should be consulted before sampling takes place (Historic England 2013).

In light of guidelines approved by the Ministry of Justice and Historic England (English Heritage 2005), the analysis of the remains to fully understand the life experience of the individual being exhumed should be considered part of the process of properly respecting the dead. This analysis can include, where appropriate, scientific analysis such as DNA and stable isotope analysis.

The final placing of the remains after scientific study and analysis will be agreed beforehand.

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).

Radiocarbon dating can be used to chronologically phase burial grounds and track developments in demographic change and variations in the health of the population.

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).

AMS can now be used to date cremated bone.

Carbon and nitrogen stable isotope analysis can be used to study diet, usually to address broad questions about a wider population, rather than to study an individual. Most studies use 30 or more skeletons. Studies have included how social position influenced diet and how diet varied with geographic location.

Strontium and oxygen stable isotope analysis can be used to determine where individuals originated from.

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. Lead coffins should not be opened. They should be reburied intact without archaeological examination.

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

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 and this should be considered in the risk assessment.

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

APPENDIX EIGHT

TREASURE

All finders of gold and silver objects, and groups of coins from the same finds, over 300 years old, have a legal obligation to report such items under the Treasure Act 1996. Prehistoric base-metal assemblages found after 1st January 2003 also qualify as Treasure.

Summary Definition of Treasure (Portable Antiquities Scheme www.finds.org.uk)

The following finds are Treasure under the Act, if found after 24 September 1997 (or, in the case of category 2, if found after 1 January 2003):

- Any metallic object, other than a coin, provided that at least 10 per cent by weight of metal is precious metal (that is, gold or silver) and that it is at least 300 years old when found. If the object is of prehistoric date it will be Treasure provided any part of it is precious metal.
- Any group of two or more metallic objects of any composition of prehistoric date that come from the same find (see below)
- Two or more coins from the same find provided they are at least 300 years old when found and contain 10 per cent gold or silver (if the coins contain less than 10 per cent of gold or silver there must be at least ten of them). Only the following groups of coins will normally be regarded as coming from the same find: Hoards that have been deliberately hidden; Smaller groups of coins, such as the contents of purses, that may have been dropped or lost; Votive or ritual deposits.
- 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.
- single precious metal coins that have been modified into objects – that is, altered in some way as to make it likely that they were taken out of circulation - can, if older than 300 years old, qualify as Treasure. This is usually seen in the form of a conversion of the coin into a brooch or pendant, or some other form of jewellery or dress accessory, evidence of which can include the addition of a suspension loop to the top, a pin (or the remains of one) at the back, or gilding. Additionally, piercings can be present.

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.

Note: An object or coin is part of the 'same find' as another object or coin if it is found in the same place as, or had previously been together with, the other object. Finds may have become scattered since they were originally deposited in the ground.

If anything is found which could be Treasure, under the Treasure Act 1996, it is a legal requirement to report it to the local coroner within 14 days of discovery. The Archaeological Contractor must comply with the procedures set out in The Treasure Act 1996. Any treasure must be reported to the coroner and to The Portable Antiquities Scheme Finds Liaison Officer, Andrew Agate, Andrew.agate@twmuseums.org.uk who can provide guidance on the Treasure Act procedures.

If you need this information in another format or language, please contact Jennifer Morrison, Archaeology Officer.

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