Archaeological Watching Brief at West Road, Fenham, Newcastle Upon Tyne

NEWMA: 2021.5

View across Trench 1, looking west, showing the section of Hadrian's Wall (scale = 0.5m graduations).

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Archaeological Watching Brief at West Road, Fenham, Newcastle Upon Tyne

ARS Ltd Report 2021/124

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Executive Summary

Project Name: Archaeological Watching Brief at West Road, Fenham, Newcastle Upon Tyne
Site Code: WEST21
Planning Authority: Newcastle City Council
Geology: Alston Formation – Pennine Middle Coal Measures Formation – Mudstone, Siltstone and Sandstone overlain by superficial deposits of Devensian Till
NGR: NZ 21391 64889
Date of Fieldwork: 3rd March – 30th April 2021
Date of Report: 31st April 2021

In March 2021 Archaeological Research Services Ltd was commissioned by Fastflow Pipeline Services Ltd on behalf of Northumbrian Water Ltd to undertake an archaeological watching brief along West Road, Fenham, Newcastle-upon-Tyne. The watching brief monitored groundworks associated with the installation of a water mains renewal pipe. The monitored area was located along the course of West Road from Fenham Reservoir to Two Ball Lonnen Roundabout, Newcastle-upon-Tyne. The route of West Road is known to follow the line of Hadrian's Wall, a Scheduled Monument and part of the Frontiers of the Roman Empire UNESCO World Heritage Site (NHLE 1000098; HER 207). The works are located to the northwest of Benwell Roman Fort (Condercum) (NHLE 1003499; HER 208). An archaeological watching brief conducted south of Fenham reservoir during 2019 identified surviving remains associated with the Roman Fort. Recent excavations at Grange Road identified the remains of an Iron Age settlement and enclosure within the vicinity of the monitored area. The works are also within the possible extent of Benwell Vicus (HER 5262). In consultation with Rachel Grahame, Tyne and Wear Archaeological Officer, groundworks were monitored to establish the extent, condition, character and date of any surviving archaeological deposits and structures.

The works comprised the archaeological monitoring of groundworks during the excavation of two pre-commencement test pits, and the renewal trench, in advance of a new water main diversion onto existing pipework. The monitored works identified a 4.5m long section of sandstone wall, and one much smaller section, believed to be part of Hadrian's Wall.

Based on research included in Breeze et al. *(forthcoming), the larger sizes of the stones used as facing stones within the sections of exposed wall at the Fenham site may indicate they were part of the earliest phases of the Wall's construction, and may have been erected by a particular legion.*

The watching brief was undertaken by Jake Hardman, Archaeological Officer at Archaeological Research Services Ltd, and managed by Rupert Lotherington, Project Manager at Archaeological Research Services Ltd.

1. Introduction

1.1 Circumstances of the Project

1.1.1 In March 2021 Archaeological Research Services Ltd. was commissioned by Gordon Mitchell at Fastflow Pipeline Services Ltd, on behalf of Northumbrian Water, to undertake an archaeological watching brief at West Road, Fenham, Newcastle Upon Tyne.

1.1.2 The watching brief monitored groundworks associated with the installation of a renewal onto the main water pipe to supply the surrounding housing. The site is located along the route of West Road, which is known to follow the line of Hadrian's Wall, a Scheduled Monument and UNESCO World Heritage Site (NHLE 1000098; HER 207). The works are located to the northwest of *Condercum* Roman Fort (NHLE 1003499; HER 208) which is integrated into Hadrian's Wall. The fort and Hadrian's Wall are part of the Frontiers of the Roman Empire Transnational World Heritage Site. The works are also within the possible extent of Benwell *Vicus* (HER 5262), the presumed extent of the civilian extramural settlement bordering the southern margins of the fort.

1.1.3 In consultation with Rachel Grahame, Tyne and Wear Archaeological Officer, groundworks along West Road, Fenham, were monitored to establish the extent, condition, character and date of any potential surviving archaeological deposits and structures. This enabled recording in accordance with current legislation as outlined in paragraph 205 of the *National Planning Policy Framework (NPPF)* (Ministry of Housing, Communities and Local Government 2021, 58).

1.2 Site Location

1.2.1 The monitored area was centred on NGR: NZ 21391 64889 and lies along West Road between Fenham Reservoir and Two Ball Lonnen Roundabout, within the projected route of Hadrian's Wall (NHLE No. 1000098) and within the presumed extent of the *vicus* (civilian settlement) (HER No. 5262) associated with Condercum Fort (HER No.1003499).

1.3 Landform Topography and Soils

1.3.1 The underlying geology of the site comprises Pennine Middle Coal Measures Formation of mudstone, siltstone and sandstone formed during the carboniferous period. This is overlain by superficial deposits of Devensian Till, formed during the quaternary period when the local environment was previously dominated by ice age conditions (British Geological Survey 2021). The soil matrix extending across the development area is characterised by permeable, seasonally wet, and slightly acid but base-rich loamy and clayey soils (Soilscape 2021).

Figure 1. Site Location.

1.4 Archaeological and Historical Background

1.4.1 The site is located within an area of extensive archaeological activity principally associated with the Roman military occupation of Hadrian's Wall. This report will only attempt to provide information pertinent to past activity in the vicinity of the development area as it is beyond the scope of the project to provide a comprehensive account of the archaeological and historical background of the Hadrian's Wall corridor.

1.4.2 Hadrian's Wall is a Scheduled Monument and a UNESCO World Heritage Site (NHLE No. 1000098; HER 207). Construction of the Wall began under Hadrian's rule in AD 122 and was completed in AD 138 (Breeze and Dobson, 2000). Hadrian's Wall was 80 Roman miles (73.65 Imperial Miles), or 117.5 km long, though its width and height varied. East of the River Irthing, the Wall is built of squared stone blocks and is 3m wide and 5-6m high, while west of the river the Wall was originally made of turf and was 6m wide and 3.5m high (Breeze and Dobson, 2000). The Wall likely had multiple functions including control of movement across the border and defending the northern frontier of the Roman Empire from raiding and large-scale attacks (Breeze and Dobson, 2000). The Wall established an efficient route of communication between the east and western components of the northern militarised zone, extending westwards from Wallsend, North Tyneside to the village of Bowness-on-Solway in Cumbria (Breeze, 2006).

1.4.3 Benwell *Vicus* (HER No. 5262) is thought to be a very large settlement expanding out from the road leading from the fort's southern entrance, concentrated on the site of the causeway across the *Vallum* and extending south along the road. The *Vallum* is known to have been deliberately backfilled and later phases of the *Vicus* are known to have expanded across the location of the *Vallum*. Previous archaeological investigation suggests that the settlement expanded to the south and south west.

1.4.4 Fenham Reservoir is located within the northern third of *Condercum* Fort. The fort of Condercum covered approximately 2.3ha and was sited on a flat hilltop overlooking the Tyne to the south and the valley of Denton Burn to the west and was garrisoned during the reign of Hadrian by a cavalry regiment of 500 troops. The fort appears to have been constructed in tandem with Hadrian's Wall. At Benwell, the vallum, (earthworks principally associated with two banks and a ditch delineating a military zone in which civilians were excluded) was noted to change alignment to skirt around the southern limits of Condercum fort. This suggests the vallum is contemporary or postdates the forts construction. The construction of Fenham Reservoir in the 1850's is believed to have removed all trace of the fort north of Westgate (West) Road, and is subsequently covered to the south by Condercum housing estate, although trace elements of the fort are known to survive in this location (Taylor, 1997).

1.4.5 Archaeological excavations conducted by Northern Archaeological Associated (NAA) in 2018 immediately north of the reservoir revealed that although construction

activity relating to the reservoir had clearly disturbed the ground, elements of earlier activity survived (Cooper, 2018). A likely road of probable Roman date on a north-north-east alignment appears to be the likely principal route leading away from the fort. No evidence for the fort was identified, however, small quantities of building material and pottery compatible with a Hadrianic date and most probably derived from *Condercum* fort were found (Cooper, 2018).

1.4.6 Further investigations in 2018 by Northern Archaeological Associates and Pre-Construct Archaeology revealed evidence of a multi-period site within the immediate area of the northern limits of Condercum Roman Fort. Tentative interpretations of the archaeological evidence, based on initial assumptions released in press statements during the excavation, have revealed pits and postholes of probable Iron Age activity later superseded by a Roman road, burials and industrial activity that are likely to be contemporaneous with Condercum Fort and Hadrian's Wall. The report has yet to be published at the time of writing.

2. Aims and Objectives

2.1 Regional Research Aims and Objectives

2.1.1 There is the potential for Roman archaeological material to survive within the boundary of the development area. Relevant research topics, applicable to this project, are identified in *Shared Visions: The North-East Regional Research Framework for the Historic Environment* (Petts and Gerard, 2006):

- Ri - Iron Age to Roman transition: Further our understanding of the social impact of the Roman military occupation on the native population (Petts and Gerrard 2006, 146).

- Rii - Roads and Communication: The Roman communication network is only superficially understood, and a greater understanding of its development is listed as a key priority (Petts and Gerrard 2006, 147).

- Riii – Roman military presence: Improved understanding of the impact of the wall on the local environment both physically and socially (Petts and Gerrard 2006, 148).

- Rv – Material Culture: Despite the large quantity of ceramics recovered during previous excavations of Wall sites there is still further research to be conducted on trade mechanisms and ceramics production which can be gained from recovery and analysis of retrieved artefactual material. (Petts and Gerrard 2006, 150).

2.1.2 Additional research topics are identified within *Frontiers of Knowledge: A Research Framework for Hadrian's Wall, Part of the Frontiers of the Roman Empire World Heritage Site*. (Mason and Symonds, 2010) and may be addressed by the fieldwork as follows:

- 4.2 Structure – Further clarification as to what extent the later plans of forts reflect the original configurations observed at Wallsend (Mason and Symonds, 2010, Vol II, 12).

- 4.2 Structure – Enable a critical analysis on the current interpretations of buildings within forts surrounding the identification and function of buildings interpreted as hospitals, workshops and storehouses. (Mason and Symonds, 2010, Vol II, 12).

- 4.3 Garrisons - Fort refuse dumps would also be a valuable resource if they could be located, and may provide data for ethnicity, as well as food preparation within the forts, which, beyond the existence of ovens in the intervallum, remains little understood. (Mason and Symonds, 2010, Vol II, 13).

- 4.5 – Infrastructure - There is a general need to understand forts within their landscape context. More specifically, the network of roads supporting the forts requires detailed attention. The extent of the individual forts' *territoria* is entirely unclear. (Mason and Symonds, 2010, Vol II, 13).

- 4.9 Economy – Improved understanding of their function and evolvement in the growing local economy of the region and their roles within the frontier land (Mason and Symonds, 2010, Vol II, 15).

- 7.1 – Locating the resource - It remains uncertain how many of the new Roman structures were green-field developments and how many overlay earlier settlement. This element is of particular interest when considering the urban zones. The ritual landscape is only poorly understood throughout all the periods under consideration but would have had an everyday significance to all those living and working in the region. (Mason and Symonds, 2010, Vol II, 23).

2.2 The Watching Brief

The aim of the watching brief was to ensure that no archaeological assets were removed or impacted upon without first being identified, characterised and recorded during the course of groundworks. This aim was achieved through the following objectives:

- Identify the presences/absence of archaeological features and deposits within the site.

- Record all archaeological features and deposits encountered.

- Gather sufficient information to establish the character, extent, form, function and likely status of any surviving archaeological deposits with a view to evaluating their significance and potential to inform the aims and objectives as outlined in section 2.1.

3. Methodology

3.1 Introduction

3.1.1 The methodology for the watching brief is outlined in detail in the Written Scheme of Investigation Specification (Appendix III to this volume) and summarised below.

3.2 Professional Standards

3.2.1 The archaeological watching brief was carried out in accordance with the CIfA's *Code of Conduct* (2019) and *Standards and Guidance for an Archaeological Watching Brief* (2020). Recording of the excavations followed the standards and conventions outlined by the *Archaeological Site Manual* (Museum of London Archaeological Service (MoLAS) (2002).

3.2.2 A risk assessment was undertaken before commencement of the work. Health and Safety regulations were adhered to at all times.

3.3 Coverage

3.3.1 The works comprised the archaeological monitoring of groundworks during the excavation of a mains renewal trench and two test pits in advance of a new water pipe connection onto existing pipework. The route of the main trench runs from Fenham Reservoir to the Two Ball Lonnen roundabout approximately 247m, incorporating the pre-commencement test pits (Figure 2).

3.4 Archaeological Monitoring

3.4.1 The archaeological watching brief was undertaken by Archaeological Research Services Ltd from the 3rd of March 2021 until the 30th of April 2021. All groundworks were monitored by a suitably qualified archaeologist.

3.4.2 The test pits and main renewal trench were excavated, under continuous archaeological supervision, by a 360 mechanical excavator equipped with a toothless ditching bucket. The excavated material was removed in level spits until archaeological deposits were identified or the groundworks contractor had reached their maximum required depth. Where feasible, any archaeological deposits identified during the course of the watching brief project were hand excavated by a professional field archaeologist to allow their date, form and state of preservation to be ascertained.

3.4.3 All archaeological features and deposits were recorded according to the principles of stratigraphic excavation. Each context was recorded on pro-forma records which included the following: character and contextual relationships; detailed description (dimensions and shape; soil components, colour, texture and consistency); interpretation and cross-references to the drawn, photographic and finds registers.

3.4.4 A photographic record was maintained including photographs of the trenches. All images were taken in digital format (10 Megapixel minimum) and contain a graduated photographic scale.

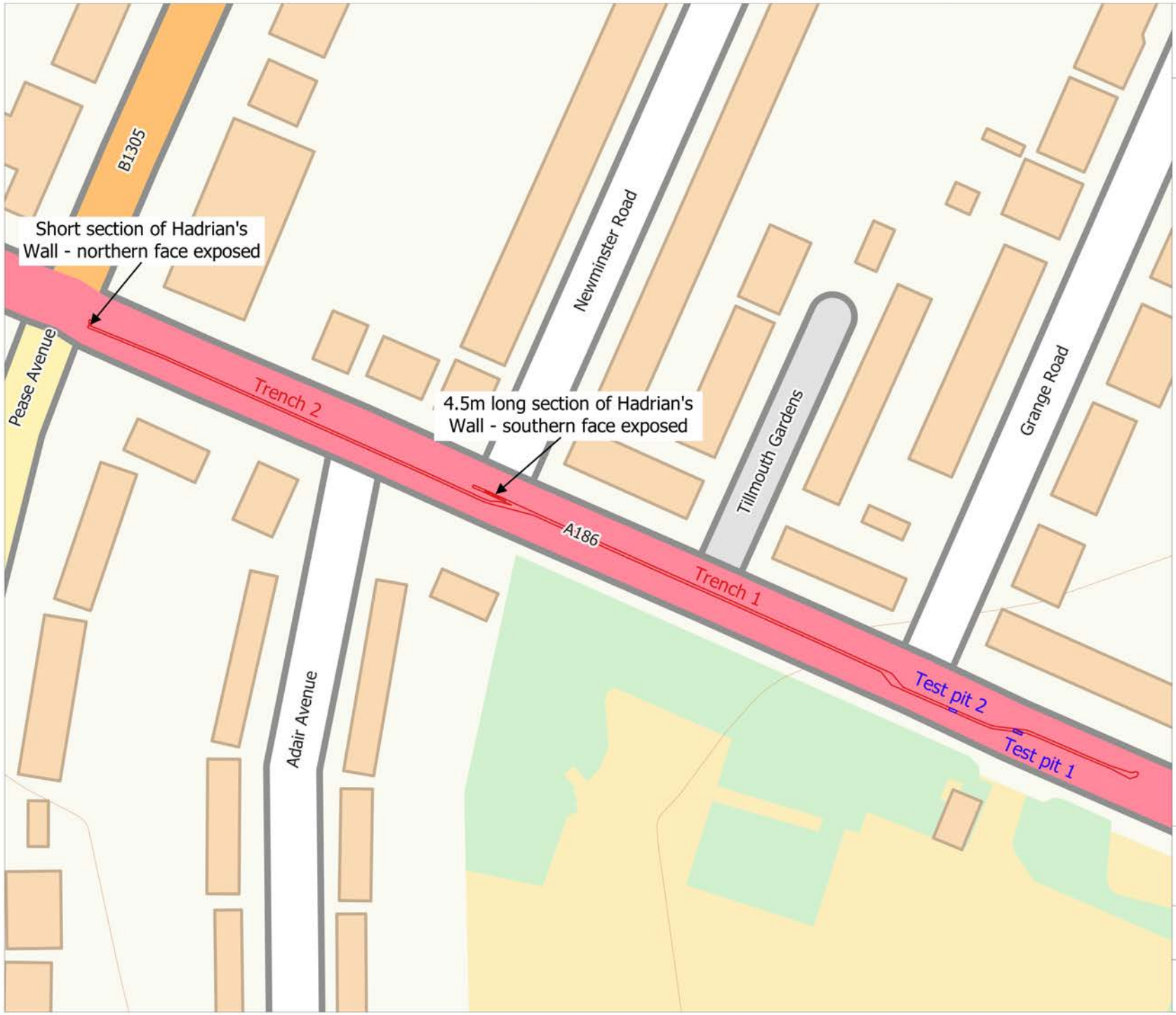

Figure 2:
Trench location plan with the locations of exposed archaeological features.

Key:

- Trench
- Test pits

0 10 20 30 40 50 m

N

Site name: West Road, Newcastle
Date: August 2021
Drawn by: PH

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4. Results

4.1 Introduction

4.1.1 The following section provides an overview and synthesis of the depositional sequence and archaeological features encountered on the site. It highlights possible areas of archaeological sensitivity and the depth at which archaeological survival might be encountered. Depths of deposits are expressed as below ground level (BGL) and in metres above Ordnance Datum (aOD).

4.1.2 A context summary table of the depositional sequence of the trenches is presented in Appendix I: Context Summary Table. This should be viewed in association with the figures and the photographs presented in this section.

4.2 Test pit 1

(Figure 3 and Figure 4)

4.2.1 Test Pit 1 measured 2.10m long, 0.70m wide and was excavated to a maximum depth of 0.66m below ground level (BGL) and 120.96m above Ordnance Datum (aOD). The test pit was orientated from south-east to north-west and was excavated centrally within West Road (A186), fronting the entrance to Pendower Hall, to locate existing underlying utilities.

4.2.2 The uppermost deposit comprised an asphalt road surface (101) which overlaid a modern concrete base layer (102). The modern concrete base layer (102) overlaid a thin sandstone crush levelling deposit (103). The sandstone crush deposit (103) seals underlying backfill deposits (106) and (109) within modern services trenches [105] and [108] respectively.

4.2.3 No finds, features or deposits of archaeological significance were identified in Test Pit 1.

Figure 3. South-west facing oblique view of Test Pit 1. (Scale = 0.5m graduations).

Figure 4. Overview of Test Pit 1. (Scale = 0.5m graduations).

4.3 Test Pit 2

(Figure 2, Figure 5 and Figure 6)

4.3.1 Test Pit 2 measured 1.8m long and 0.60m wide and was excavated to a maximum depth of 0.86m BGL and 120.67m aOD. The test pit was sited 13m west of Test Pit 1. It was orientated from south-east to north-west and was excavated centrally within West Road opposite the southern Grange Road entrance in order to locate underlying utilities.

4.3.2 The depositional sequence within Test Pit 2 was broadly similar to the stratigraphy identified in Test Pit 1 noted above. The test pit was excavated through a modern asphalt road surface (201) followed by an underlying modern concrete base layer (202) which overlay a modern sandstone crush levelling subbase deposit (203). The crushed sandstone sub-base layer (203) sealed underlying backfill deposit (206) within modern service trench [205]. The natural substrate was observed within the base of the trench and comprised a dark yellow-brown sandstone brash (207).

4.3.3 No finds, features or deposits of archaeological significance were identified in Test Pit 2.

Figure 5. South-west facing oblique view of Test Pit 2. (Scale = 0.5m graduations).

Figure 6. Overview of Test Pit 2. (Scale = 0.5m graduations).

4.4 Trench 1

(Figure 7, Figure 8, Figure 9, Figure 10 and Figure 11)

4.4.1 Trench 1 comprised the initial proposed route of the open-cut trench, measuring *c*.205m long and *c*.0.60m wide, and was excavated to a maximum depth of 1.60m BGL and between 121.83m aOD in the south-east and 117.4m aOD in the north-west. The trench was located centrally within West Road (A186) and ran from Fenham Reservoir in the south-east to the junction with Newminster Road in the north-west. Trench 1 also encompassed the excavated areas of Test Pit 1 and Test Pit 2. Three different natural substrates were identified along the course of Trench 1, consisting of sandstone brash (305) 0.75m BGL, sandstone bedrock (306) 0.50m BGL and clay (330) 1.10m BGL.

4.4.2 The uppermost deposit comprised a modern asphalt road surface (301) which overlaid a concrete base layer (302). The concrete base layer (302) sealed a levelling sub-base of crushed sandstone (303). The stratigraphic sequence resulting from the levelling and installation of the road surface sealed a series of superimposed, mixed backfill deposits within modern utility trenches identified throughout the excavation of Trench 1.

4.4.3 Stone deposit (340) was identified *c*.48m from the western extent of Trench 1, it comprised large fragments of sub-angular, roughly hewn and squared sandstone laid on a bed of dark grey silty clay (341). The stone was interpreted as forming a base layer or rough surface for a 19th century road.

Figure 7. Section of Trench 1 in plan. Note surface (340) at base of trench. (Scale = 0.5m graduations).

Figure 8. East facing section through Trench 1. Note preserved sandstone surface (340) in section. (Scale = 0.5m graduations).

4.4.4 Located within the south-west facing section of Trench 1, immediately below the modern road surface base layers, a 4.5m long length of sandstone wall (345) was encountered, *c*.9.3m from the western extent of Trench 1. The centre of the wall was located at NGR NZ 21366 64899. The wall had been constructed using large rectangular and square dressed sandstone blocks with the inclusion of a single large granite rectangular block. Two courses of stones were exposed, bonded together with light compacted clay mixed with small irregular fragments of sandstone (346). The large blocks are interpreted as the facing stones for the southern face of the structure, while medium-sized irregular sandstone blocks (346) represented the stepped foundations and were integrated within it, similarly bonded with the light compacted clay (351). The foundations were seen to project *c*.0.38m from the edge of the facing stones. The largest sandstone block measured 0.36m wide, 0.25m high and over 0.22m deep. The large granite block, representing the largest of the facing stones, measured 0.7m wide, 0.41m high and 0.2m deep. Table 1, below, records the sizes of the facing stones based on the categorisation included in Breeze *et al.* (forthcoming). The composition, construction and depositional sequence of the structure indicate that the exposed masonry represents the southern face of Hadrian's Wall, the single granite block possibly representing a later repair. No cut was

visible, indicating that the surrounding deposits derive from levelling and installation of a subsequent later road surface.

Table 1. Categorisation of the size of the facing stones. According to the categories assigned in Breeze *et al*. (forthcoming). The stone number is noted on the section and plan drawings in Figure 17.

Stone no.	**Width x height (mm)**	**Depth (minimum)**	**Size**
1	240 x 220	330	Normal
2	320 x 230	270	Quite large
3	350 x 200	220	Quite large
4	320 x 200	220	Quite large
5	330 x 280	210	Quite large
6	320 x 260	230	Quite large
7	290 x 230	240	Quite large
8	360 x 250	220	Large
Granite block	700 x 410	200	Very large

Figure 9. View looking north-west across Trench 1 with Hadrian's Wall (345) in the trench's south-west facing section. (Scale = 0.5m graduations).

Figure 10. South facing section through Trench 1 looking down on the remains of Hadrian's Wall showing the single large granite block. (Scale = 0.5m graduations).

Figure 11. South-west facing oblique view of Trench 1 showing the remains of Hadrian's Wall (345) and compacted sandstone rubble (346) adjacent. (Scale = 0.5m graduations).

4.4.5 No further finds, features or deposits of archaeological significance were identified within Trench 1.

4.5 Trench 2

4.5.1 Trench 2 was the rerouting of the open-cut trench which ran parallel to the encountered wall (345)/(346) with a buffer of 0.60m therefore avoiding it. Trench 2 was located centrally within West Road, orientated south-east to north-west, and ran from the junction with Newminster Road to the Two Ball Lonnen roundabout.

4.5.2 The uppermost deposit comprised a modern asphalt road surface (401) which overlaid a concrete base layer (402). The deposits resulting from the levelling and installation of the modern road surface were seen to have sealed a series of superimposed, mixed backfill deposits within modern utility trenches that were identified throughout the excavation of Trench 2. Two different natural substrates were identified along the course of Trench 2, consisting of sandstone bedrock (409) at 0.50m BGL and clay (406) at 1.10m BGL.

4.5.3 On the south-facing edge of Trench 2, the aforementioned road surfacing deposits overlay a dark grey silty clay demolition deposit with frequent large sub-angular sandstone blocks, ceramic building material and charcoal (403). The demolition deposit is likely

associated with ground levelling for construction of the modern West Road (A186), either redepositing natural sandstone bedrock or potentially stones associated with the sandstone wall encountered in Trench 1 (345).

Figure 12. North-west facing section of Trench 2. Note the demolition deposit underlying the concrete road sub-base containing frequent sub-angular sandstone blocks (403). (Scale = 0.5m graduations).

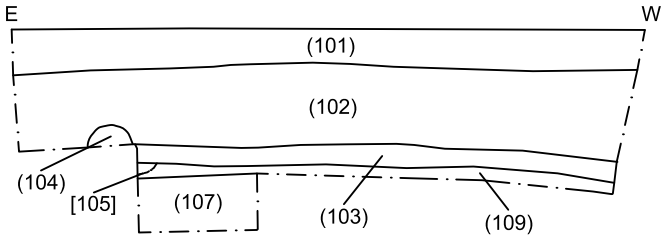
4.5.3 At the extreme north-western end of Trench 2 the trench widened out where the replacement water pipe was to be connected up to the existing mains supply. Located beneath the modern road surface and a number of modern service trenches was a large, old, metal water pipe running south-east to north-west along the line of West Road. Situated directly below this water pipe at a depth of 1.46m BGL, a sandstone wall, believed to be Hadrian's Wall, was encountered. Due to the large water pipe above it, visibility and ease of access to the Wall was not very good. It also appeared to have been heavily truncated in order for the water pipe to be inserted. A 0.6m wide section of the northern face of the wall was visible and was seen to have been constructed using faced, rectangular, sandstone blocks (424). The wall continued beyond the limits of the excavation therefore it was not clear how many courses had survived in this location. To the south of the facing stones, what is believed to be the Wall's rubble core was encountered however; the limit of the excavation did not extend enough in order to locate the Wall's southern face in this location. The core consisted of small-medium fragments of sandstone bedded within orange/grey sandy clay. The Wall's northern face was abutted by brown/grey sandy clay (425) which is believed to be redeposited material.

Figure 13. The terminus of Trench 2 at the north-western extent, looking north-east. (Scale = 0.5m graduations).

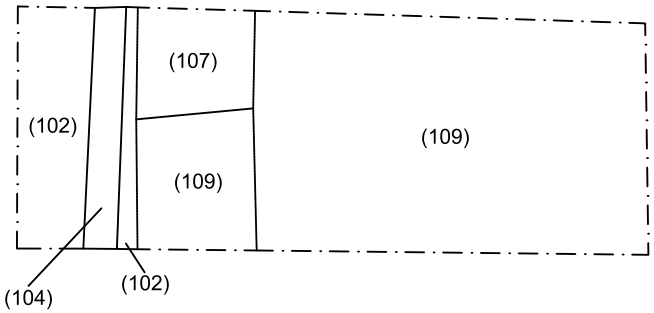
Figure 14. The northern face of Hadrian's Wall (424) where it was encountered beneath a large metal water pipe, looking south-west. (Scale = 0.5m graduations).

Figure 15. The rubble core of Hadrian's Wall. The large metal water pipe can be seen at the top of the photo. (Scale = 0.25m).

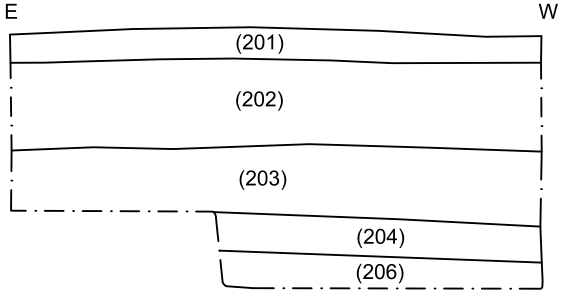
North facing section of
Test Pit 1



Plan of Test Pit 1



North facing section of
Test Pit 2



Plan of Test Pit 2

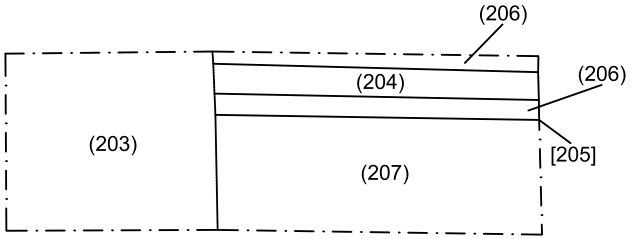


Figure 16:
Plans and sections of Test Pits 1 and 2.

Limit of Excavation

Site name: West Road
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Drawn by: PH

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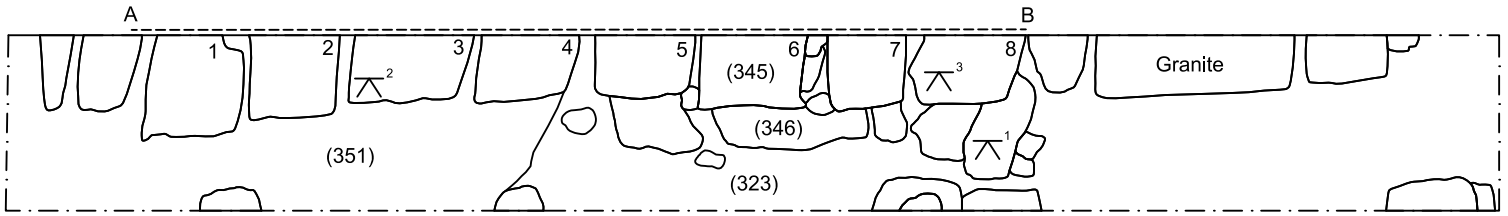
Figure 17:
Plan and section of Hadrian's Wall encountered within Trench 1.

Limit of Excavation

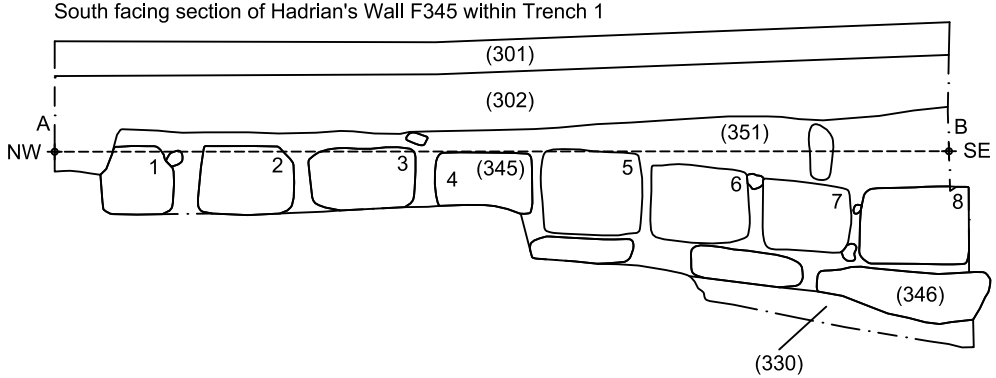
Section Line

Plan of Hadrian's Wall F345 within Trench 1



1 - 117.186m aOD
2 - 117.517m aOD
3 - 117.377m aOD

South facing section of Hadrian's Wall F345 within Trench 1



0 1m

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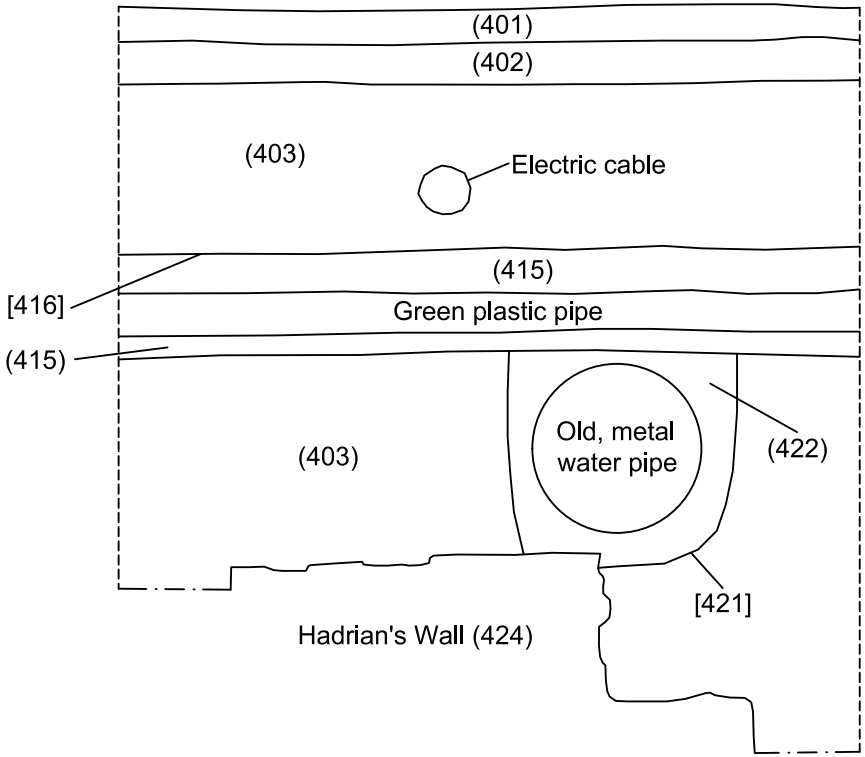
Figure 18:
Section of Hadrian's Wall encountered within Trench 2.



Limit of Excavation

Section Line

N

0 1m

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5. Discussion

5.1 The monitored groundworks were carried out along West Road in Benwell/Fenham, Newcastle. Two test pits confirmed the location of existing services before a trench measuring *c*.247 long and 0.6m wide was excavated from Fenham Reservoir in the south-east to Two Ball Lonnen roundabout in the north-west. While West Road is known to follow the line of Hadrian's Wall, and the Wall has been found elsewhere within the vicinity, it has not been previously documented in the area of the watching brief and the degree to which it had survived, if at all, was unknown.

5.2 Along the majority of the pipe run route the encountered deposits included modern road makeup, deposits associated with a 19th century road, and modern services. At the junction with Newminster Road, approximately 155m from the south-eastern end of the trench, a *c*.4.5m length of sandstone masonry revealed is interpreted as part of Hadrian's Wall. The wall was found within the south-west facing section of the trench and had clearly been truncated at its south-eastern end. The wall was aligned west-north-west, at an oblique orientation to the direction of the trench. The trench was terminated and diverted elsewhere to preserve the archaeological stonework, therefore it is not known how far the wall continues in a south-westerly direction.

5.3 The section of wall was constructed using large rectangular and square dressed sandstone blocks, with a single granite block used as a probable repair. Two courses of stonework were exposed, and revealed that the stones had been bonded together using clay mixed with small fragments of chipped sandstone. The larger blocks, which formed the face of the wall, were sat upon smaller irregular blocks had been used to form the stepped foundations. The largest sandstone block measured 0.36m wide, 0.25m high and over 0.22m deep. The large granite block, representing the largest of the facing stones, measured 0.7m wide, 0.41m high and 0.2m deep

5.4 Further to the north-west, within the terminus of the diverted trench, the Wall was once again encountered. In this location, however, the northern face was exposed and recorded. Here, the wall was positioned directly beneath a large, old, metal water pipe, the installation of which appears to have truncated the stonework. Only one course of stonework was exposed, although more may be present beyond the limit of excavation. Part of the rubble core was also exposed, although the southern face of the wall was not.

5.5 A forthcoming article in Archaeologia Aeliana by Breeze *et al.* (forthcoming) discusses the sizes of the stones used in the building of the curtain wall, and that the varying dimensions of the stones used along the Wall's length may reveal information about its history. It has been noted that particularly large stones were used to build certain sections of the Wall while much smaller, less well dressed stones were used elsewhere. Questions have been asked as to what the reason for this may be. For example, it has been suggested that the larger stones were used within the 'Broad Wall' sector whose greater width than later sections would have required larger stones to retain the weight of the core (Breeze *et al.* forthcoming, 65). Some of the stones used in sections of the Wall that are visible above ground were measured and then categorised as either 'very large', 'large', 'quite large' or 'normal'. Based on the measurements for the largest stone noted in the wall during the groundworks (0.36m wide, 0.25m wide and over 0.22m deep), this example would be categorised as 'large'. The large granite block, at 0.7m wide, is larger

than any of the stones included in the categorisation table (Breeze *et al.* forthcoming, 69). Some of the largest stones included within this study were noted east of Turret 7b, at Denton (Breeze *et al.* forthcoming, 69), only *c*.1.6km to the north-west of the where the watching brief exposed the section of wall. The article concludes that sections of the wall using the larger sandstone blocks are believed to be the earliest sections. The implications of this are that the section of wall uncovered at Fenham is also part of one of the earliest sections. It is thought that perhaps smaller stones became the later preference as they would have taken less effort and man-power (Breeze *et al.* forthcoming, 94). Furthermore, the larger stones may have been the work of a particular legion who constructed the wall between Denton and Heddon-on-the-Wall (Breeze *et al.* forthcoming, 94). The article also discusses the Wall's core and the fact that the larger facing stones are usually seen accompanied by a mortar core, whereas the Fenham section of wall appeared to have had a clay and rubble core. Unfortunately not enough of the wall's core was exposed during the watching brief to determine its exact composition.

5.6 Based on the evidence, it is possible that the section of Hadrian's Wall exposed at Fenham during the watching brief belongs to one of the earliest phases of the Wall's construction. Regardless, this section of the Wall was previously undocumented and the information gained through the monitoring of the groundworks has therefore been a welcome addition to what is already known of this invaluable heritage asset. In addition, the results highlight the high archaeological potential of works undertaken along the route of West Road (A186) within the World Heritage corridor of Hadrian's Wall.

6. Publicity, Confidentiality and Copyright

6.1 Any publicity will be handled by the client.

6.2 ARS Ltd will retain the copyright of all documentary and photographic material under the Copyright, Designs and Patent Act (1988).

7. Statement of Indemnity

7.1 All statements and opinions contained within this report arising from the works undertaken are offered in good faith and compiled according to professional standards. No responsibility can be accepted by the authors of the report for any errors of fact or opinion resulting from data supplied by any third party, or for loss or other consequence arising from decisions or actions made upon the basis of facts or opinions expressed in any such report(s), howsoever such facts and opinions may have been derived.

8. Archive

8.1 A digital and paper archive will be prepared by ARS Ltd, consisting of all primary written documents, plans, sections, photographs and electronic data, and will be deposited with the Great North Museum in accordance with the specification compiled by Jennifer Morrison, Tyne and Wear Archaeology Officer at Newcastle City Council and in

line with relevant CIfA guidance: *Standard and Guidance for the creation, compilation, transfer and deposition of archaeological archives* (CIfA 2014b) and *Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials* (CIfA 2014a). An OASIS record has also been completed for this work, including a digital version of this report (Ref. archaeol5-428592.)

9. Acknowledgements

9.1 Archaeological Research Services Ltd would like to thank all those involved with this work, in particular Ben Ralston for commissioning the work on behalf of Northumbrian Water Ltd, and Don O'Meara, Inspector of Ancient Monuments for the North-East and Hadrian's Wall, for his guidance.

10. References

Breeze, D., P. Hill and A. Thiel. Forthcoming. 'The Stones, the Core and the Offsets of Hadrian's Wall' in Archaeologia Aeliana.

British Geological Survey. 2019. Geology of Britain viewer. Available online at: http://mapapps.bgs.ac.uk/geologyofbritain/home/html [Accessed 15th August 2019].

Campbell, G., Moffett, L., and Straker, V. 2011. *Environmental Archaeology. A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation* (2nd edn). Portsmouth: Historic England.

Chartered Institute for Archaeologists (CIfA). 2019. *Code of Conduct.* Reading, Chartered Institute for Archaeologists.

Chartered Institute for Archaeologists (CIfA). 2020. *Standard and Guidance for an Archaeological Watching Briefs*. Reading, Chartered Institute for Archaeologists.

Chartered Institute for Archaeologists (CIfA). 2014a. *Standard and Guidance for the collection, documentation, conservation and research of archaeological materials*. Reading, Chartered Institute for Archaeologists.

Chartered Institute for Archaeologists (CIfA). 2014b. *Standard and Guidance for the creation, compilation, transfer and deposition of archaeological archives*. Reading, Chartered Institute for Archaeologists.

Department of Culture Media and Sport. (DCMS). 2008. Treasure Act 1996 Code of Practice (Second Revision). London, The Stationery Office.

Ministry of Housing, Communities and Local Government. 2018. *The National Planning Policy Framework.* London, The Stationery Office.

Petts, D and Gerrard, C. 2006. Shared Visions: The North-East Regional Research Framework for the Historic Environment. Durham County Council.

Society of Museum Archaeologists. 1993. *Selection, Retention and Dispersal of Archaeological Collections. Guidelines for use in England, Wales and Northern Ireland.* London: Society of Museum Archaeologists.

Appendix I: Context Summary Table

Context	Type	Description: ***Processual Interpretation***
101	Deposit	Modern dark blueish black asphalt road surface sealing all underlying deposits in Test Pit 1. Same as (201 / 301 / 401). *20th Century.*
102	Deposit	Pale grey concrete subbase for asphalt road surface sealing all underlying deposits in Test Pit 1. Same as (202 / 302 / 402). *20th Century.*
103	Deposit	Pale yellow sandstone levelling deposit sealing all underlying deposits in Test Pit 1. Same as (203 / 303). *20th Century.*
104	Masonry	Dark grey North to South orientated cast pipe utility. *20th Century.*
105	Cut	Sharp concave North to South orientated linear utility trench cut for overlying cast pipe {104}. *20th Century.*
106	Fill	Dark greyish brown silty clay construction backfill for utility trench [105]. Same as (304). *20th Century.*
107	Masonry	Dark grey East to West orientated cast pipe utility. *20th Century.*
108	Cut	Sharp flat East to West orientated linear utility trench for cast pipe {107}. *20th Century.*
109	Fill	Dark greyish brown silty clay construction backfill for utility trench [108]. *20th Century.*
201	Deposit	Modern dark blueish black asphalt road surface sealing all underlying deposits in Test Pit 2. Same as (101 / 301 / 401). *20th Century.*
202	Deposit	Pale grey concrete subbase for asphalt road surface sealing all underlying deposits in Test Pit 2. Same as (102 / 302 / 402). *20th Century.*
203	Deposit	Pale yellow sandstone levelling deposit sealing all underlying deposits in Test Pit 1. Same as (103 / 303).

		20th Century.
204	Masonry	Dark grey East to West orientated cast pipe utility. *20th Century.*
205	Cut	Sharp concave East to West orientated linear utility trench for cast pipe {204}. *20th Century.*
206	Fill	Dark greyish brown silty clay construction backfill for utility trench [205]. *20th Century.*
207	Deposit	Undisturbed natural yellowish brown sandstone brash at the base of Test Pit 2. Same as (305). *Natural substrate.*
301	Deposit	Modern dark blueish black asphalt road surface sealing all underlying deposits in Trench 1. Same as (101 / 201 / 401). *20th Century.*
302	Deposit	Pale grey concrete subbase for asphalt road surface sealing all underlying deposits in Trench 1. Same as (102 / 202 / 402). *20th Century.*
303	Deposit	Pale yellow sandstone levelling deposit sealing all underlying deposits in Trench 1. Same as (103 / 203). *20th Century.*
304	Fill	Dark greyish brown silty clay construction backfill for East to West orientated utility trench. Same as (106). *20th Century.*
305	Deposit	Undisturbed natural yellowish brown sandstone brash. Same as (207). *Natural substrate.*
306	Deposit	Undisturbed natural sandstone bedrock. *Natural substrate.*
307	Cut	East to West orientated linear utility trench visible in plan along the base of Trench 1. *19th Century.*
308	Fill	Dark yellowish brown silty clay construction backfill of linear utility trench [307]. *19th Century.*

309	Deposit	Dark greyish sandy clay demolition deposit. *20th Century.*
310	Masonry	Cast iron triangular service access point for drainage utility, sealing brick housing {311}. *20th Century.*
311	Masonry	Red brick service housing for drainage utility, present in North-west facing section of Trench 1. *20th Century*
312	Deposit	Dark greyish brown sandy clay with frequent gravels and sandstone crush. Construction backfill for utility cut [314], securing brick housing {311}. *20th Century.*
313	Deposit	Pale brownish grey sandy clay levelling deposit underlying the utility backfill (313), cut by utility trench [314]. Present in South-east facing section. *20th Century.*
314	Cut	Sharp rectangular construction cut for brick utility access {311}. *20th Century.*
315	Masonry	North to South orientated utility cast pipe laid within levelling deposit (317), no distinct construction cut visible, located 0.20m East of {316}. *20th Century.*
316	Masonry	North to South orientated utility cast pipe running across Trench 1, 0.50m below ground level within levelling deposit (317), no distinct construction cut visible, located 0.20m West of {315}. *20th Century.*
317	Deposit	Dark greyish brown silty clay levelling deposit possibly associated with the backfill for installation of utility pipes {315} and {316}. *20th Century.*
318	Deposit	Redeposited coarse compacted pale yellowish brown sand/sandstone at the base of Trench 1. *Unknown.*
319	Masonry	North to South orientated cast pipe utility. *20th Century.*
320	Cut	Sharp linear North to South orientated utility Trench for cast pipe {119}.

		20th Century.
321	Masonry	East to West orientated cast pipe utility. *20th Century.*
322	Cut	East to West orientated construction cut of utility trench for large cast pipe {321}. *20th Century.*
323	Deposit	Dark brownish grey sandy clay levelling deposit. *20th Century.*
324	Masonry	Sandstone block utility housing, large sub-angular blocks sealing internal loose small/medium sized sandstone rubble (325). *19th Century.*
325	Masonry	Sandstone rubble infill of sandstone blocks utility housing {324}. *19th Century.*
326	Fill	Mid greyish brown silty clay naturally accumulating infill of utility housing {324}. *19th/20th Century.*
327	Cut	Sharp construction cut for sandstone block utility housing {324}. *19th Century.*
328	Deposit	Pale brownish yellow undisturbed natural clay. Same as (406). *Natural Substrate.*
329	Deposit	Dark greyish brown silty clay demolition deposit. *19th Century.*
330	Deposit	Dark brown sandy silty clay loam underlying (329). *Unknown.*
331	Fill	Very dark greyish brown silt, construction backfill for cast pipe utility {332}. *20th Century.*
332	Masonry	North to South orientated cast utility pipe. *20th Century.*
333	Cut	Sharp concave North to South orientated linear utility trench for cast pipe {332}. *20th Century.*
334	Fill	Mid greyish brown silt construction backfill for North-west to South-east orientated cast pipe {335}.

		20th Century.
335	Masonry	North-west to South-east orientated cast utility pipe. *20th Century.*
336	Cut	North-west to South-east orientated sharp linear construction cut for cast pipe utility {335}. *20th Century.*
337	Deposit	Mid greyish brown silty clay levelling deposit cut by utility trench [336]. *19th Century.*
338	Deposit	Black silty clinker demolition deposit containing frequent ash, rubble and ceramic building material. *20th Century.*
339	Deposit	Dark greyish brown silt subsoil. Overlain sandstone surface {340}. *20th Century.*
340	Masonry	Roughly hewn/roughly squared sandstone road surface constructed with randomly coursed sandstone blocks and slabs lay flat on bed. Overlain dark grey silty slay (341). *19th Century.*
341	Deposit	Dark grey silty clay demolition deposit with frequent sandstone rubble and post-medieval ceramic building material. Same as (403). *19th Century.*
342	Deposit	Dark grey silty clay levelling deposit with occasional small sandstone rubble underling sandstone surface (340). *19th Century.*
343	Masonry	Large sub-angular sandstone block-constructed housing for drainage utility access. *19th Century.*
344	Masonry	Single course of medium rectangular sandstone blocks visible in South facing section through Trench 1 overlying the natural clay. Possibly associated with drainage utility sandstone housing {343}. *19th Century.*
345	Masonry	East to West orientated sandstone wall comprised of large dressed rectangular sandstones, and one granite, blocks bonded with compact yellow clay (351). *Romano-British.*
346	Masonry	Sandstone rubble infill/foundations associated with the East to West

		orientation wall (345) *Romano-British.*
347	Masonry	Group of loosely piled sub-rectangular sandstone blocks immediately east of the sandstone wall {345}. Likely redeposited sandstone blocks from subsequent demolition. *19th Century*.
348	Deposit	Dark grey silty clay demolition deposit underlying sandstone blocks (347). *19th Century.*
349	Fill	Mid grey silty clay construction backfill for utility access [350] securing sandstone housing (343) *19th Century*.
350	Cut	Sharp rectangular construction cut for utility access infilled with sandstone housing (343) and construction backfill (349). *19th Century.*
351	Fill	Pale yellowish brown clay with occasional flecks of ceramic building material and charcoal used as bonding material and construction backfill for Hadrian's Wall (345) *Romano-British.*
401	Deposit	Modern dark blueish black asphalt road surface sealing all underlying deposits in Trench 2. Same as (101 / 201 / 301). *20th Century.*
402	Deposit	Pale grey concrete subbase for asphalt road surface sealing all underlying deposits in Trench 2. Same as (102 / 202 / 302). *20th Century.*
403	Deposit	Dark grey silty clay demolition deposit with frequent sub-angular sandstone blocks, ceramic building material and flecks of charcoal. Same as (341). *19th Century.*
404	Deposit	Redeposited pale brownish yellow clay underlying demolition deposit (403). *19th Century.*
405	Deposit	Mid greyish brown mottled silty clay underling levelling deposit (404). *19th Century.*
406	Deposit	Pale brownish yellow undisturbed natural clay. Same as (328).

		Natural Substrate.
407	Cut	North to South orientated sharp cut of linear ditch running across course of Trench 2, truncating demolition deposit (403), redeposited clay (404) and natural bedrock outcrop (409). *19th Century.*
408	Fill	Dark bluish grey coarse silty clay fill of North to South orientated ditch [407], with frequent inclusions of medium sub-angular sandstone blocks, ash and ceramic building material. *19th Century.*
409	Deposit	Naturally formed sandstone outcrop or large irregular sandstone blocks naturally bonded with dark brownish yellow sandy clay. *Natural Substrate.*
410	Cut	Construction cut for drainage utility access cutting through levelling deposit (403) and natural bedrock outcrop (409). *19th Century.*
411	Fill	Dark grey coarse silty clay backfill of drainage utility access cut [410] with inclusions of frequent charcoal and ceramic building material. *20th Century.*
412	Deposit	Dark greyish mottled orange silty clay demolition/levelling deposit with frequent flecks of charcoal and ceramic building material. Frequent large sub-angular sandstone blocks *20th Century.*
413	Cut	Large demolition cut. *20th Century.*
414	Fill	Demolition deposit consisting of black silty clinker, infilling large demolition cut [413]. Inclusions of frequent ceramic building material, ash and charcoal. *20th Century.*
415	Fill	Fill of fibre duct trench – grey/brown sand. *20th Century*
416	Cut	Cut for (2216) *20th Century*
417	Cut	Cut for blue water pipe. *20th Century*
418	Fill	Pea gravel around duct within [415]. *20th Century*

419	Deposit	Concrete above (417) in [416]. *20th Century*
420	Deposit	Tarmac above concrete (418). *20th Century*
421	Cut	Cut for large metal water pipe. *19th Century*
422	Fill	Fill of cut for metal water pipe [420]. *19th Century*
423	Structure	Brick-built manhole. *19th Century*
424	Masonry	Sandstone wall – Hadrian's Wall. Visibility poor. Northern face visible and some of the rubble core but the southern face was not detected. *Romano-British*
425	Deposit	Brown/grey sandy clay abutting Hadrian's Wall. *19th Century.*

Appendix II: Written Scheme of Investigation

Tyne and Wear Archaeology Service

Specification for Archaeological Watching Brief at West Road, Fenham, Newcastle upon Tyne

Planning Application: Fastflow

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Date: 26/02/2021

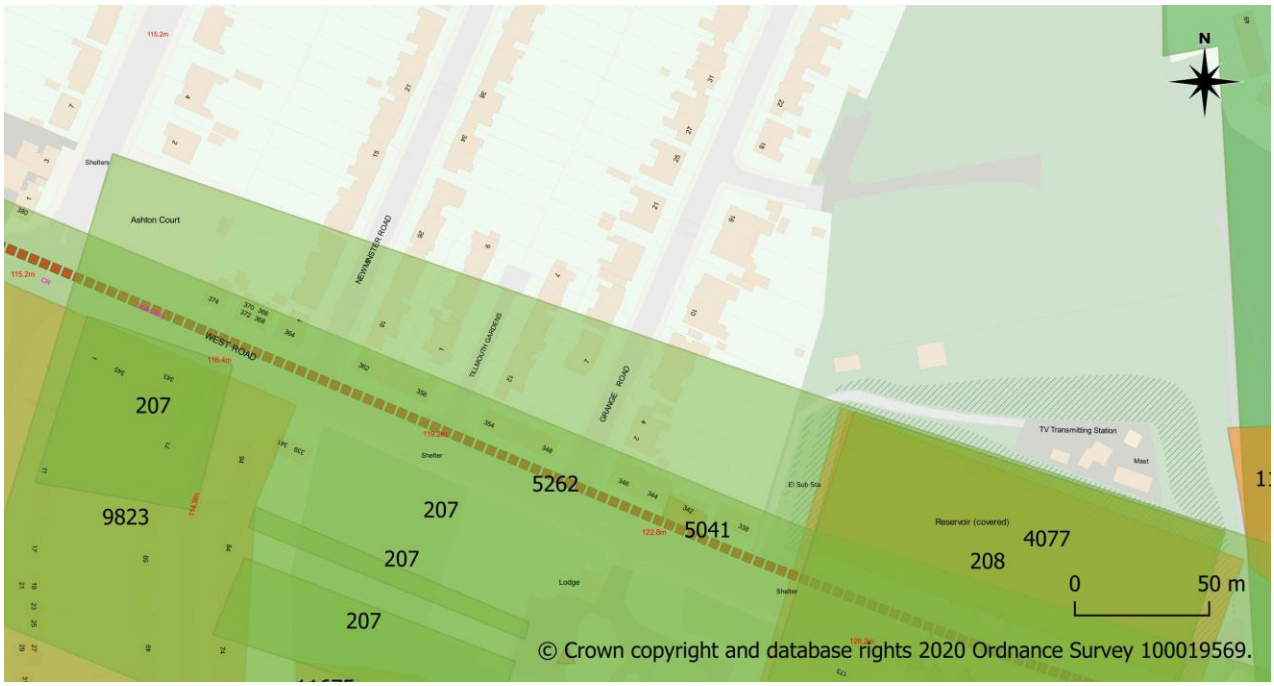
County Archaeologist's Reference Number: MON17593

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

Newcastle City Council

Introduction

Site grid reference: NZ 2139 6488



Fastflow are installing a new water main along West Road from Fenham Reservoir to Ball Lonnen roundabout.

The works are located to the northwest of Benwell Roman Fort (Condercum) (HER 208) (partly destroyed by Fenham Reservoir, but survives very well to the south of Westgate Road, where parts are protected as a Scheduled Ancient Monument), on Hadrian's Wall (HER 207). The Hadrian's Wall corridor lies along Westgate Road. The fort and Hadrian's Wall are part of the Frontiers of the Roman Empire Transnational World Heritage Site. The works are also within the possible extent of Benwell vicus (HER 5262).

A housing development, located to the north of the fort, was the site of archaeological evaluation and subsequently excavation between 2017 and 2019. This work recorded evidence of a road leading northward from the fort, bordered by Romano-British settlement and extensive field systems and enclosures. The settlement site was abandoned later in the Roman period and the site used for agriculture, but appears to have been reoccupied in the early medieval period.

Ground disturbing work must therefore be monitored by an archaeologist as a Watching Brief, in order that any archaeological remains can be recorded.

The watching brief must be carried out by a suitably qualified and experienced archaeological organisation. The appointed archaeologist must familiarise themselves with the results of previous archaeological work on the site before starting work.

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 Watching Briefs.

The work will record, excavate and environmentally sample (if necessary) 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.

A toothless bucket will be used on the plant employed on site to reduce damage to archaeological remains.

The commissioning client will provide plans indicating the location of the proposed work.

Research Aims and Objectives

The watching brief 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.

Notification

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

PROJECT INITIATION

PROJECT DESIGN

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

PROJECT EXECUTION

The tasks

1 A construction timetable has yet to be agreed. Tenders for the Watching Brief should therefore be a cost per day including overheads such as travel costs and equipment. Contingency costs will be provided for environmental sampling and scientific dating per sample and for finds analysis. Any variation on the agreed timetable will be notified by the client, who will give a minimum of 48 hours notice of a change on the days of site attendance. Close liaison between the parties involved will be needed to co-ordinate this element of the work.

2 The work involves undertaking a structured watching brief to observe and record any archaeological deposits and finds from this locality. The absence of deposits and finds must be recorded as negative evidence. **The Watching Brief will not aim to hinder the construction programme, however should archaeological remains be found, the appointed archaeologist must be allowed sufficient time to fully record (by photograph and scale plan and section), excavate and environmentally sample (if necessary) the archaeological deposits.** Within the course of the Watching Brief, it may be possible to record sections through the stratigraphy exposed during the construction work.

Photographic Recording

The photographic record can be taken in **either** black and white print and colour transparency **or** with a digital camera. 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 (if the results warrant the production of an 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 showing the location of the watching brief.

Where the findings warrant it, plans and sections through archaeological features will be produced. Such plans will include at least two site grid points and will show section line end points.

General Conditions

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 Archaeological Contractor must maintain a Site Diary for the benefit of the Client, with full details of Site Staff present, duration of time on site, etc. and contact with third parties.

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

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

Post-excavation and report production

Finds Processing and Storage

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

Finds will be assessed by an experienced finds specialist.

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.

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.

If necessary, pottery sherds and bricks should be recommended for Thermo-luminescence dating.

Finds processing, storage and conservation methods must be broadly in line with current practice, as exemplified by the IFA “Standard and guidance for the collection, documentation, conservation and research of archaeological materials”, 2001. Finds should be appropriately packaged and stored under optimum conditions, as detailed in the RESCUE/UKIC publication “First Aid for Finds” (Watkinson and Neal 1998). Proposals for ultimate storage of finds should follow the UKIC publication “Guidelines for

the Preparation of Excavation Archives for Long-term Storage" (Walker 1990). Details of methodologies may be requested from the Archaeological Contractor.

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

All objects must be stored in appropriate materials and conditions to ensure minimal deterioration. Advice can be sought from Don O'Meara of Historic England (don.o'meara@historicengland.org.uk) here necessary.

Products

The report

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

The archaeological contractor will provide a report of archaeological operations, including:

- a site location plan and grid reference
- brief description of recording procedures
- plans and sections of stratigraphy recorded (if practical)
- report on the finds (if any)
- environmental report (if relevant)
- colour photographs of the site and any significant archaeological features/finds
- a summary of the results of the work
- copy of this specification

The report will form an addition to the *Short Reports* files in the Tyne and Wear Historic Environment Record.

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

- for deposition in the County HER

Three pdf copies are needed:

- one for the commissioning client
- one for deposition in the County HER at the address on the first page. Please do not attach this to the paper report.
- one for Historic England's Hadrian's Wall Archaeologist (Bessie Surtees House, 41-44 Sandhill, Newcastle upon Tyne NE1 3JF)

The report and CD/PDF 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.

Site Archive

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" (CIfA 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.)

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

Use tie-on rot-proof labels where necessary

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

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

Use permanent ink on bags and labels

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

The archive will be placed in a suitable form in the appropriate museum:

Great North Museum: Hancock for Hadrian's Wall and the medieval town of Newcastle

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.

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

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 watching brief 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 at the address below.

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, may be 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/uksi/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

The watching brief may reveal archaeological features which require sampling.

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

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-slags (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 retains 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 wattling must be recorded. Wood samples can provide information on woodland management such as medieval coppicing, type of taxa (native or foreign), conversion technology (how the wood was turned into planks), building techniques and type of tools used.

Suitable samples should be submitted for dendrochronological dating. See English Heritage guidelines, "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 Home Office 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 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 Rachel Grahame, Archaeology Officer.

Bibliography

ACAO, 1993, Model Briefs and Specifications for Archaeological Assessments and Field Evaluations.

Blinkhorn, Edward and Milner, Nicky, 2013, Mesolithic Research and Conservation Framework

The British Archaeologists and Developers Liaison Group, 1991, Code of Practice

Brown, D.H. 2011. Archaeological Archives – A guide to best practice in creation, compilation, transfer and curation. Institute for Archaeologists and the Archaeological Archives Forum. 2nd Edition. http://www.archaeologyuk.org/archives/aaf_archaeological_archives_2011.pdf

CIfA 2014. Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives. http://www.archaeologists.net/sites/default/files/CIFAS&GArchives_2.pdf

Confederation of British Industry, 1991, Archaeological Investigations Code of Practice for Mineral Operators

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

Cox, M (ed), 1998, Grave concerns: Death and Burial in England 1700-1850

Department for Communities and Local Government 2012. National Planning Policy Framework. Crown Copyright. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

Department of Transport, 1993, Design Manual for Roads and Bridges, Volume 11, Section 3, Part 2: Cultural Heritage

Dungworth, S. and Harrison, D. 2011. Belsay Castle, Belsay, Northumberland. Scientific Analysis and Historic Interpretation of Decorated Window Glass by Henry Gyles of York. Centre for Archaeology Reports, 97/2011. http://research.historicengland.org.uk/Report.aspx?i=15049&ru=%2fResults.aspx%3fp%3d1%26n%3d100%26k%3dglass%26ns%3d1

English Heritage and the Archaeological Leather Group 1995. Guidelines for the Care of Waterlogged Archaeological Leather. http://www.archleathgrp.org.uk/EHGuidelines.pdf

English Heritage, 2002, Human Remains from Archaeological Sites, Guidelines for producing assessment documents and analytical reports

English Heritage, 2003, Finds and Conservation Training Package

English Heritage, 2003, A Strategy for the Care and Investigation of Finds

English Heritage 2004. Dendrochronology: Guidelines on producing and interpreting dendrochronological dates. https://historicengland.org.uk/images-books/publications/dendrochronology-guidelines/

English Heritage and CoE 2005 Guidance for best practice for treatment of human remains excavated from Christian burial grounds in England. Swindon, English Heritage. https://historicengland.org.uk/images-books/publications/human-remains-excavated-from-christian-burial-grounds-in-england/

English Heritage and Environmental Agency 2005. Guidance on Assessing the Risk Posed by Land Contamination and its Remediation on Archaeological Resource Management. https://content.historicengland.org.uk/images-books/publications/assessing-the-risk-posed-by-land-contamination/landcontamination.pdf/

English Heritage 2006a. Archaeomagnetic Dating. English Heritage, Swindon. https://historicengland.org.uk/images-books/publications/archaeomagnetic-dating-guidelines/

English Heritage 2006b. Guidelines on the X-radiography of archaeological metalwork. English Heritage, Swindon. https://historicengland.org.uk/images-books/publications/x-radiography-of-archaeological-metalwork/

English Heritage 2006c. Management of Research Projects in the Historic Environment: The MoRPHE Project Managers Guide. English Heritage, Swindon.

English Heritage 2006d. Science for Historic Industries: Guidelines for the investigation of 17th- to 19th-century industries. English Heritage, Swindon. https://historicengland.org.uk/images-books/publications/science-for-historic-industries/

English Heritage 2008a. Investigative Conservation. Guidelines on how the detailed examination of artefacts from archaeological sites can shed light on their manufacture and use. https://historicengland.org.uk/images-books/publications/investigative-conservation/

English Heritage 2008b. Luminescence Dating: guidelines on using luminescence dating in archaeology. English Heritage, Swindon. https://historicengland.org.uk/images-books/publications/luminescence-dating/

English Heritage 2010. Waterlogged Wood: Guidelines on the recording, sampling, conservation and curation of waterlogged wood. Swindon, English Heritage. https://historicengland.org.uk/images-books/publications/waterlogged-wood/

English Heritage 2011a. Archaeological Evidence for Glassworking: Guidelines for Best Practice. English Heritage, Swindon. https://historicengland.org.uk/images-books/publications/glassworkingguidelines/

English Heritage 2011b. Environmental Archaeology. English Heritage, Swindon. 2nd edition. https://historicengland.org.uk/images-books/publications/environmental-archaeology-2nd/

English Heritage 2012. Waterlogged Organic Artefacts: Guidelines on their recovery, analysis and conservation. Swindon, English Heritage. https://historicengland.org.uk/images-books/publications/waterlogged-organic-artefacts/

English Heritage, 2013, Science and the Dead

English Heritage 2014.Animal Bones and Archaeology. English Heritage, Swindon. https://historicengland.org.uk/images-books/publications/animal-bones-and-archaeology/

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

Historic England 2015a. Archaeological and Historical Pottery Production Sites. Historic England, Swindon. https://historicengland.org.uk/images-books/publications/archaeological-and-historic-pottery-production-sites/

Historic England 2015b. Archaeometallurgy: Guidelines for best practice. Historic England, Swindon. https://historicengland.org.uk/images-books/publications/archaeometallurgy-guidelines-best-practice/

Historic England 2015c. Digital Image Capture and File Storage: Guidelines for Best Practice. Historic England, Swindon. https://historicengland.org.uk/images-books/publications/digital-image-capture-and-file-storage/

Historic England. 2015d. Geoarchaeology. Historic England, Swindon. https://historicengland.org.uk/images-books/publications/geoarchaeology-earth-sciences-to-understand-archaeological-record/

Historic England. 2016a. Drawing for Understanding. Historic England, Swindon. https://historicengland.org.uk/images-books/publications/drawing-for-understanding/

Historic England 2016b. Understanding Historic Buildings. Historic England, Swindon. https://historicengland.org.uk/images-books/publications/understanding-historic-buildings/

Historic England 2016c. Preserving Archaeological Remains, Historic England, Swindon.

IFA 2008. Standard and Guidance for the collection, documentation, conservation and research of archaeological materials. http://www.archaeologists.net/sites/default/files/ifa_standards_materials.pdf

Leonard, Ian (Digital Archive Officer, English Heritage), 2005, Digital Imaging Guidelines

Mays, S, 2010, The Archaeology of Human Bones, second edition

McKinley and Roberts, 1993, Excavation and post-excavation treatment of cremated and inhumed human remains

Museum and Galleries Commission 1992. Standards in the Museum Care of Archaeological Collections. http://www.collectionstrust.org.uk/media/documents/c1/a79/f6/000072.pdf

Nicholson, R. 1988. The Fish Remains. In: O'Brien, C. Bowen, L, Dixon, S and Nicholson, R. *The Origins of the Newcastle Quayside: Excavations at Queen Street and Dog Bank*. The Society of Antiquaries of Newcastle upon Tyne.

Paynter, S. 2004. Analyses of Colourless Roman Glass from Binchester, County Durham. Centre for Archaeology Report. 21/2004. http://research.historicengland.org.uk/Report.aspx?i=14250&ru=%2fResults.aspx%3fp%3d1%26n%3d10%26k%3dglass%26ns%3d1

Petts, David with Gerrard, Christopher, 2006, Shared Visions: The North-East Regional Research Framework for the Historic Environment

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

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

Symonds, Matthew FA and Mason, David JP (eds), 2010, Frontiers of Knowledge

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

Walker, 1990, Guidelines for the Preparation of Excavation Archives for Long-term Storage (UKIC publication)

Watkinson and Neal, 1998, First Aid for Finds (RESCUE/UKIC publication)

Appendix III: OASIS Form

Summary for archaeol5-428592

OASIS ID (UID)	archaeol5-428592
Project Name	An Archaeological watching brief on West Road, Fenham, Newcastle
Activity type	WATCHING BRIEF
Project Identifier(s)	
Planning Id	
Reason For Investigation	Planning requirement
Organisation Responsible for work	Archaeological Research Services Ltd
Project Dates	03-Mar-2021 - 30-Apr-2021
Location	West Road, Fenham NGR : NZ 21391 64889 LL : 54.9781536149299, -1.66732403445361 12 Fig : 421391,564889
Administrative Areas	Country : England County : Tyne & Wear District : Newcastle upon Tyne Parish : Newcastle upon Tyne, unparished area
Project Methodology	In March 2021 Archaeological Research Services Ltd was commissioned by Fastflow Pipeline Services Ltd on behalf of Northumbrian Water Ltd to undertake an archaeological watching brief along West Road, Fenham, Newcastle-upon-Tyne. The watching brief monitored groundworks associated with the installation of a water mains renewal pipe. The works exposed two seperate sections of sandstone wall, believed to be Hadrian's Wall.
Project Results	This was not collected in OASIS IV when this record was originally created
Keywords	
HER	Tyne and Wear HER - unRev - STANDARD
HER Identfiers	
Archives	