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NEWCASTLE CITY COUNCIL

STEPHENSON MONUMENT

WESTGATE ROAD

NEWCASTLE UPON TYNE

ARCHAEOLOGICAL EVALUATION AND WATCHING BRIEF REPORT

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NEWCASTLE CITY COUNCIL

Stephenson Monument, Westgate Road, Newcastle upon Tyne

Archaeological Evaluation and Watching Brief

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SUMMARY

Wardell Armstrong Limited (WA Ltd.) was commissioned by Newcastle City Council, to undertake an archaeological evaluation and watching brief at Stephenson Monument, Westgate Road, Newcastle upon Tyne NE1 1TT (NGR: NZ 24749 63958). The evaluation and watching brief was required in advance of new public realm scheme as the development area sits on the line of Hadrian's Wall, a UNESCO World Heritage Site. Undisturbed pockets of Roman archaeology are known in the area. The site may also contain archaeological deposits or features relating to the medieval graveyard of St. John. The evaluation was undertaken in accordance with a specification prepared by Claire MacRae, Tyne and Wear Archaeology Officer.

The evaluation consisted of two trenches opened on the east and western sides of the site across the carriageway of a closed off section of Westgate Road. Trench 1 revealed a brick lined culvert that was likely to be of mid-18th – 19th century in date. It was covered by later deposits and cut by several modern service ducts. Trench two revealed an oval-shaped brick structure that may have been a vertical shaft for a sewer. There were remains of brick/sandstone walls at either end of the trench that may have formed cellars and had been backfilled. These features appeared to be 19th century in date. The covering deposits had been cut by modern service ducts also. There was no evidence of the wall ditch that was excavated in 1934 by the North of England Excavation Committee in a trench close to the location of Trench 1.

The watching brief comprised of the observation of the excavation of a narrow trench and two test pits. A brick lined culvert was observed in the north end of the trench. It was of similar construction as the culvert in Trench 1 but more substantial. It was covered by some of the same deposits observed in Trenches 1 and 2. The culvert and deposits had been cut by several modern services. There was no surviving evidence of Hadrian's Wall or associated deposits observed. No archaeological remains were observed in the two test pits.

ACKNOWLEDGEMENTS

Wardell Armstrong Limited (WA Ltd.) thanks Newcastle City Council for commissioning the project, and for all their assistance throughout the work. Also, WA Ltd. thank Claire MacRae, Tyne and Wear Archaeology Officer, at Newcastle City Council for their assistance.

Wardell Armstrong Limited (WA Ltd.) also thanks the Newcastle City Council groundwork crew for their help during this project.

The evaluation and watching brief was supervised by Mike McElligott who also wrote the report and was assisted on site by Sean Johnson and Ron Brown. Finds assessment was by Sue Thompson and palaeoenvironmental assessment by Lynne Gardiner. The samples were processed and sorted by Mark Lawson. The shell was identified by Faidra Katsi, who also examined the flots. The project was managed by Frank Giecco and the report edited by Richard Newman.

1. INTRODUCTION

1.1 Project Circumstances and Planning Background

1.1.1 In February 2017, Wardell Armstrong Limited (WA Ltd.) undertook an archaeological evaluation at Stephenson Monument, Westgate Road, Newcastle upon Tyne (NGR: NZ 2475 6396). It was commissioned by the Client who intends to commence a new public realm scheme around the Stephenson Monument traffic island. The proposed scheme includes resurfacing work, the installation of seating/ planters and interpretation relating to the assumed line of Hadrian's Wall.

1.1.2 The proposed public realm scheme around the Stephenson Monument traffic island that sits on the line of Hadrian's Wall, a UNESCO World Heritage Site and may also contain archaeological deposits or features relating to the medieval graveyard of St. John, the heritage significance of which may be affected by the application.

1.2 Project Documentation

1.2.1 The project conforms to a specification prepared by Claire MacRae, Tyne and Wear Archaeology Officer (TWAS, January 2017) that provided a specific methodology based for a programme of archaeological trial trench evaluation and test pits. This was approved by the archaeological planning advisor prior to the fieldwork taking place. This is in line with government advice as set out in Section 12 of the National Planning Policy Framework (NPPF 2012).

1.2.2 This report outlines the work undertaken on site, the subsequent programme of post-fieldwork analysis, and the results of this scheme of archaeological evaluation and watching brief.

2. METHODOLOGY

2.1 Standards and guidance

2.1.1 The archaeological evaluation was undertaken following the Chartered Institute for Archaeologists *Standard and Guidance for archaeological field evaluation* (2014a), the Chartered Institute for Archaeologists *Standard and Guidance for archaeological watching briefs* (2014b) and in accordance with the WA Ltd. fieldwork manual (2017).

2.1.2 The fieldwork programme was followed by an assessment of the data as set out in the *Standard and Guidance for archaeological field evaluation* (ClfA 2014a) and the *Standard and Guidance for the collection, documentation, conservation and research of archaeological materials* (ClfA 2014c).

2.2 The Field Evaluation and Watching Brief

2.2.1 The evaluation comprised the excavation of two trenches measuring c.7m in length by 1.75m in width in Trench 1 and 1.5m in Trench 2, across the proposed development area that measured 22.93m². The trenches were placed to target the possible line of the Wall ditch associated with Hadrian's Wall based on excavations carried out in 1928 (AA (4), XI, 277 – 233). The general aims of these investigations were:

- to establish the presence/absence, nature, extent and state of preservation of archaeological remains and to record these where they were observed;
- to establish the character of those features in terms of cuts, soil matrices and interfaces;
- to assess the impact of the application on the archaeological site;
- to recover artefactual material, especially that useful for dating purposes;
- to recover palaeoenvironmental material where it survives in order to understand site and landscape formation processes.

2.2.2 The watching brief comprised the excavation of a trench measuring c.13m in length by c.0.7m in width near the centre of the development area along with two test pits measuring 1.5m in length by 1.4m in width. The trench and test pits were placed to locate services and check ground conditions. The general aims of these investigations were:

- allow the monitoring archaeologist to signal that an archaeological find has been made before it is destroyed

- to provide the opportunity for appropriate resource allocation if the archaeological find cannot be dealt with under the watching brief remit
- to determine the presence or absence of buried archaeological remains within the proposed development site
- to determine the character, date, extent and distribution of any archaeological deposits and their potential significance
- determine levels of disturbance to any archaeological deposits from past building activities.

2.2.3 Deposits considered not to be significant were removed by a 180°/360° tracked/wheeled mechanical excavator with a toothless ditching bucket, under close archaeological supervision. The trial trenches were subsequently cleaned by hand. All possible features were inspected and selected deposits were excavated by hand to retrieve artefactual material and environmental samples. Once completed all features were recorded according to the WA Ltd. standard procedure as set out in the Excavation Manual (WA Ltd. 2017).

2.2.4 All finds encountered were retained on site and returned to the Carlisle office where they were identified, quantified and dated to period. A *terminus post quem* was then produced for each stratified context under the supervision of the WA Ltd. Finds Officer, and the dates were used to help determine the broad date phases for the site. On completion of this project, the finds were cleaned and packaged according to standard guidelines (Ibid). Please note, the following categories of material will be discarded after a period of six months following the submission of this report, unless there is a specific request to retain them (and subject to the collection policy of the relevant depository):

- unstratified material;
- modern pottery;
- material that has been assessed as having no obvious grounds for retention.

2.2.5 On completion the evaluation trenches and watching brief trench and test pits were reinstated by replacing the excavated material with sub base.

2.2.6 A full professional archive has been compiled in accordance with the project specification, and the Archaeological Archives Forum recommendations (Brown 2011). The archive will be deposited with Great North Museum, with copies of the

report sent to the Tyne and Wear HER, available upon request. The archive can be accessed under the unique project identifier SMN-A.

2.2.7 Wardell Armstrong Limited supports the Online Access to the Index of Archaeological Investigations (OASIS) project. This project aims to provide an on-line index and access to the extensive and expanding body of grey literature, created as a result of developer-funded archaeological work. As a result, details of the results of this project will be made available by WA Ltd. as a part of this national project. The OASIS reference for the project is: wardela2-278216.

3. BACKGROUND

3.1 Location and Geological Context

- 3.1.1 The site is located at NZ 24749 63958 and lies within an urban context in the centre of Newcastle City. The site is on a closed off section of Westgate Road (A186) bounded to the north by a path and the former Union Rooms pub and the Vita Student Accommodation building and by the re-routed A186 to the west, south and east. The area of investigation lies at a height of c.33.81m aOD (above Ordnance Datum) with the ground sloping down gently from west to east.
- 3.1.2 The site is approximately 944m² in size and the site's environs comprise concrete paving slabs and a tarmac road surface.
- 3.1.3 The underlying solid geology within the area of investigation is mapped as Pennine Middle Coal Measures Formation (Sandstone) formed in the Carboniferous Period (312 to 309 million years ago). This is overlain by Devensian – Diamicton Till formed in the Quaternary Period (2 million years ago) (BGS 2017).

3.2 Historical and Archaeological Background

- 3.2.1 Several archaeological works have been undertaken within the development area. In 1934, the North of England Excavation Committee undertook an excavation that involved opening a trench across Westgate Road and Neville Street from near the southeast corner of St. John's churchyard that abutted the western side of the Stephenson Monument (Spain 1934). It revealed the remains of a large ditch under the road and interpreted as the wall ditch and the line of Hadrian's Wall was assumed to run under the Stephenson Monument.
- 3.2.2 An evaluation was undertaken by Tyne and Wear museum at the former Hertz building on Westgate road, c.150m to the southeast of the development area. A section of Hadrian's Wall was observed. It shared the characteristic construction of a broad wall with a flagged foundation course overlain by an offset first course of large blocks (TWM 2004).
- 3.2.3 An evaluation was undertaken by PCA Ltd (PCA Ltd 2005) at the junction of Grainger Street and Westgate Road, c.103m to the east of the development area. No pre post-medieval archaeological remains were observed.

- 3.2.4 **Roman:** Excavations from the 1920's and 30's had reported observations of Hadrian's Wall along Westgate Road, was interpreted by the North of England Excavation Committee, that it ran to the south of Westgate Road and the wall ditch ran under the modern carriageway but these findings has since been questioned. Evidence of the Wall was found to the west of the Westgate Arts Centre. A section of a milecastle was observed at 67-75 Westgate Road with the outer edge of the wall ditch found (to the west of the site). The evidence for the milecastle on the south side of the road also indicates that the wall itself was located on the south side of Westgate Road at this point.
- 3.2.5 **Medieval:** The site lies within the core of the medieval town, inside the walled precinct, and within the parish of the medieval church of St. John the Baptist (13th century), which lies to the north-west of the site. The route now occupied by Westgate Road was one of the principal thoroughfares of the medieval town. The Hospital of St. Mary the Virgin, founded in the 12th century, was located on the south side of the thoroughfare, to the east of the site. The chapel of the hospital lay under Neville Street and the traffic island upon which Stephenson's Monument stands. North-south burgage plots that ran from the frontages onto Westgate Street, showing the medieval built form of the town can be seen on Thomas Oliver's map of 1830.
- 3.2.6 **Post-medieval and Modern:** Buildings fronting both sides of the street can be seen on John Speed's map of 1611 and their density had intensified by the early 1720's based on James Corbridge's map of 1723. Oliver's map of 1830 demonstrates that the layout of plots held on burgage tenure remained fossilised in the early 19th century street plan (PCA Ltd 2005). The site lay adjacent to the 20th century Westgate House that was demolished in 2007.

4. ARCHAEOLOGICAL EVALUATION AND WATCHING BRIEF RESULTS

4.1 Introduction

4.1.1 The evaluation and watching brief was undertaken between the 21st and 24th February 2017, with two trenches excavated across the proposed development site for the evaluation and two test pits and a trench excavated for the watching brief (Figure 2). The evaluation trenches were placed to target the possible line of the wall ditch associated with Hadrian's Wall and possible archaeological deposits or features relating to the medieval graveyard of St. John. The watching brief test pits and trench were located to check for services and ground conditions. The trench crossed a section of the Stephenson monument traffic island that sits on the line of Hadrian's Wall, a UNESCO World Heritage Site, potentially targeting the assumed line of the wall.

4.2 Evaluation Results

4.2.1 **Trench 1** was situated in the western end of the development area, across the old disused carriageway of Westgate Road (A186) (Figure 2; Plate 1). The eastern side of the trench was only excavated to a depth of 0.18m as two metal pipes were revealed, that ran the length of the trench and were covered by a mid-grey sub base (**113**).

4.2.2 The trench was aligned north-northeast – south-southwest and was 1.75m wide and 7m long. The trench was excavated to a maximum depth of 1.35m (32.09m aOD) revealing c.0.15m of firm dark grey silty clay (**105**) at the northern end of the trench only and its extent was unclear (Plate 2). Culvert {**108**} was constructed on top of this layer and will be discussed below. Deposit (**105**) was covered by c.0.34m of a loose dark red brown sandy clay (**106**) with lenses of dark brown sandy clay and contained moderate stone, pebbles and occasional fragments of bone. This layer was covered by c.0.05m of firm brown yellow dolomite/ rubble mix (**103**). It was sealed by c.0.50m of firm mid brown grey sandy clay that contained moderate stones, pebbles and occasional fragments of brick (**102**). This layer was visible throughout the trench and covered culvert {**108**}.

4.2.3 Deposit (**102**) along with the lower deposits and culvert were cut by a series metal pipes encased in concrete that followed the line of the road near its centre and by a series of ceramic pipes encased in concrete also at the southern end of the trench. These services were visible in trenches 2 and 3, to the east. At the southern end of the trench, (**102**) was partially covered by c.0.22m of firm dark brown silty clay (**107**) (Plate

- 3). It was covered by c.0.28m of a light yellow brown dolomite/ rubble mix (**104**). This layer and (**102**), in the central and northern sections of the trench were sealed by 0.18m of mid-grey concrete (**101**) that in turn was sealed by c.0.18m of tarmac that consisted of an earlier surface, (**112**) and the existing surface (**100**) (33.40m aOD).
- 4.2.4 Culvert **{108}** was located along the western side of the trench aligned roughly north-northeast – south-southwest (Figure 3; Plates 4 & 5). The sides of its construction cut, **[114]** were unclear but it appeared to have a flat base that sat on top of layer (**105**). It ran straight and measured 4.75m long by 0.4m wide by 0.38m high (32.76m aOD). The culvert consisted of a single course of thin roughly squared sandstone slabs **{115}** (400mm by 300mm by 50mm) that formed the floor. Overlying the floor were two rows of red bricks (220mm by 120mm by 110mm) on either side forming a channel. There were three courses of bricks **{110}** laid in stretcher bonding pattern and were bonded with mid grey mortar. Roughly squared sandstone slabs **{109}** (380mm by 320mm by 80mm) were placed on top of the bricks capping them. Within the channel, there was a loose dark brown silty clay (**111**) that contained occasional stones, pebbles, mortar pieces and four sherds of 19th century glass. This appeared to be a mid-18th – 19th century culvert that may be associated with the Union Rooms building to the north.
- 4.2.5 **Trench 2** was situated in the western end of the development area, across the old disused carriageway of Westgate Road (A186) (Figure 2; Plate 6).
- 4.2.6 The trench was aligned north-northeast – south-southwest and was 1.50m wide and 7m long. The trench was excavated to a maximum depth of 1.50m (31.37m aOD) revealing in the southern end of the trench c.0.60m of dark red brown sandy clay with lenses of dark brown sandy clay (**206**) that contained moderate stone, pebbles and occasional fragments of bone (Plate 7). It appeared to be a continuation of (**106**) that was observed in Trench 1. It appeared to cover wall **{207}** in the southwest corner of the trench and wall **{215}** (Plate 8) in the southeast corner. It was covered by c.0.20m of loose black silty clay (**205**) that contained frequent small stones and was in turn beneath c.0.15m of friable mid grey silty clay (**204**) that contained occasional stones. It was sealed by c.0.14m of firm brownish yellow dolomite/ rubble mix that also sealed structure **{210}** near the centre of the trench.
- 4.2.7 In the northern end of Trench 2 c.1m of firm light to mid-grey clay (**212**) (Plate 9) that contained brick fragments and occasional small stone. It appeared to be a backfill layer

for a possible cellar. A wall {211} was revealed 0.36m in from the section face. This deposit and (203) were sealed by 0.22m of mid-grey concrete that was in turn sealed by c.0.18m of tarmac that consisted of an earlier surface, (201) and the existing surface (200) (32.96m aOD).

- 4.2.8 Beneath (212), wall {211} was located 0.36m in from the east-southeast facing section at the northern end of the trench and was partially visible (Figure 4; Plate 9). It was aligned roughly north-south and measured 0.92m by 0.26m by 0.55m high (32.19m aOD). The wall comprised of five courses of red brick (240mm by 120mm by 80mm) laid in English bonding pattern and bonded with light grey mortar. It was covered by (212). This brickwork formed the remains of a demolished wall that may have been part of a cellar or may be associated with structure {210}, to the south. Its southern end was cut by modern services encased in concrete that were visible in trenches 1 and 3 also.
- 4.2.9 Structure {207} was located in the southwest corner of the trench, visible within the section face only (Figure 4; Plate 7). It consisted of four courses of roughly hewn sandstone blocks (350mm long by 160mm high) that were laid in random courses. It appeared to be aligned roughly north-south and measured 0.5m long by 0.51m high (31.86m aOD). Its southern end was cut by series of modern ceramic pipes encased in concrete and were visible in trenches 1 and 3. It may have been remains of a cellar and may have been associated with wall {215}, in the southeast corner of the trench.
- 4.2.10 Wall {215} was located in the southwest corner of the trench, visible within the section face only (Figure 4; Plate 8). It consisted of two courses of red brick {213} (220mm by 80mm) laid in English bond and bonded with light grey mortar. It was aligned roughly north-south and measured 0.7m long by 0.23m high. It appeared to be brick footing for a wall. There were two courses of roughly hewn, straight faced sandstone blocks {214} laid on top of the bricks. The coursing appeared to be random. It measured 0.5m long by 0.35m high (32.17m aOD). It may have formed a wall for a cellar and was possible associated with {207} to the west. Its southern end was cut by series of modern ceramic pipes encased in concrete.
- 4.2.11 Structure {210} was located on the western side of the trench near its centre (Figure 4; Plates 10 & 11) that was only partially visible and was not fully recorded for health and safety reasons. It was oval-shaped and measured c.1.50m long by 0.9m wide by c.6m deep (34.72m aOD). The construction cut [208] was visible on the southern side

only as the northern side was cut by modern services. It measured 0.9m deep with sharp very steep sloping side. It was backfilled by (209) that was loose mixed mid brown silty clay that contained moderate stone. The structure consisted of red brick laid in header bonding pattern that were bonded with light grey mortar. There was a stone lintel on the northern side under the capping kerb stones that were used to seal it. Under the lintel, there appeared to be a bricked in opening. This filled in opening may be associated with wall {211}, to the north. It was unclear what its function was but it appeared to have been possibly a vertical access shaft into a sewer.

4.3 Watching Brief Results

4.3.1 **Trench 3** was situated near the centre of the development area between trenches 1 and 2, across the old disused carriageway of Westgate Road (A186) (Figure 2; Plate 12).

4.3.2 The trench was aligned north-northeast – south-southwest across the central and southern side of the carriageway for 5.23m to the kerb, turning to a north-south direction for 7.72m through the Stephenson monument traffic island. It measured 13.15m in total length by 0.9m wide. The trench was excavated to a maximum depth of 1.04m (31.91m aOD) in the carriageway side of the trench revealing c.0.28m of dark red brown sandy clay with lenses of dark brown sandy clay (308) that contained moderate charcoal flecks, stone, occasional flint, brick fragments bone fragments and pieces of shell. It appeared to be a continuation of (106) that was observed in Trench 1 and (206) in Trench 2 and it covered culvert {309}. It was covered by c.0.21m of compact dark grey/ black sandy clay that contained occasional gravel patches, brick fragments, moderate small and medium stones. It was sealed by 0.21m of mid-grey concrete (306) that was covered by c.0.28m of tarmac that consisted of an earlier surface, (313) and the existing surface (305) (33.11m aOD). The layers and the culvert were cut by a metal pipe at their northern end with ceramic pipes encased in concrete cutting through their southern end.

4.3.3 The traffic island side of the trench was excavated to a depth of 1m (32.13m aOD) in sections because of the impact of services and the concrete pad for the former Westgate House. It revealed c.0.5m of loose mid brown sandy clay backfill (301) that was sealed by c.0.9m of loose light brownish yellow dolomite/ rubble mix throughout. It was covered by c.0.05m of loose light grey brown sand (303) that was a levelling layer. It was covered by 0.07m thick concrete paving slabs (300) (33.12m aOD).

- 4.3.4 Culvert **{309}** was located in the northern end (carriageway side) of the trench (Figure 5; Plate 13) 1m below the existing surface (32.11 aOD) and was aligned northwest-southeast measuring 0.88m wide by 0.7m deep. The sides of the culvert construction cut **[314]** were not visible. It was unclear what it was cut into or sat on but the sides and top of the structure were covered by **(308)**. It consisted of a single course of red brick on the base with two rows of red brick walls **{310}** (220mm by 110mm by 70mm) forming a central channel 0.6m deep. There were seven courses of brick laid in English bond and bonded with light grey mortar. The floor sloped downwards west to east from the centre of the channel. The channel was filled by loose dark brown sandy clay **(312)** that contained occasional stones, flint fragments along with one piece of animal bone and 26 sherds of glass dated to the 19th century. It was 0.36m wide and 0.38m deep. The brick walls were capped by a single course of roughly squared sandstone slabs **{311}** (700mm by 540mm by 100mm). It appeared to be a mid-18th – 19th century culvert, possibly associated with the former Unions Rooms building to the northwest.
- 4.3.5 **Test pit 1** was located near the centre of the carriageway between trenches 1 and 3 (Figure 2; Plate 14). It was rectangular shaped that measured 1.5m long by 1.4m wide. It was excavated to a maximum depth of 0.7m that revealed c.0.3m of firm brown grey clay **(405)** that contained moderate stone. It was not bottomed and was cut by a north-south aligned modern plastic service duct across its western side that was filled by c.0.4m of firm brown/ yellow dolomite/ rubble backfill **(404)**. Deposit **(405)** was covered by c.0.11m of loose grey brown silty sand **(403)** that contained moderate stone, pebbles and mortar. It may have been a levelling layer for the concrete base that measured 0.18m thick that sealed **(404)** and **(403)**. The concrete was sealed by c.0.06m of red tarmac **(401)** that in turn was sealed by c.0.1m of black tarmac **(400)** that was the upper layer.
- 4.3.6 **Test pit 2** was located on the western end of the area, to the west of trench 1 (Figure 2). It was rectangular shaped that measured 1.54m long by 1.40m wide. It was only excavated to a depth of 0.18m that revealed mid grey concrete **(502)** that was covered by c.0.09m of red tarmac **(501)** that in turn was covered by c.0.09m of black tarmac **(500)** that was the current upper surface. The trench was not fully excavated as services were located under the concrete.

5. FINDS

5.1 Introduction

5.1.1 A total of three artefacts, weighing 9900g, were recovered from two deposits during an archaeological evaluation on land at Stephenson's Monument, Newcastle Upon Tyne.

5.1.2 All finds were dealt with according to the recommendations made by Watkinson & Neal (1998) and to the Chartered Institute for Archaeologists (CIfA) Standard & Guidance for the collection, documentation, conservation and research of archaeological materials (2014c). All artefacts have been boxed according to material type and conforming to the deposition guidelines recommended by Brown (2011), EAC (2014) and the Great North Museum.

5.1.3 The material archive has been assessed for its local, regional and national potential and further work has been recommended on the potential for the material archive to contribute to the relevant research frameworks.

5.1.4 A small quantity of artefacts were also recovered from environmental samples, ranging in date from a single late medieval fragment, to 18th-19th century material.

5.1.5 The finds assessment was compiled by Sue Thompson.

5.2 Ceramic Building Material

5.2.1 Three post-medieval bricks weighing 9900g were recovered from contexts {110} and {210}. The sherds are fairly unabraded, and in moderate to good condition. They display little evidence of post-depositional damage.

5.2.2 The bricks are roughly made and of slightly irregular size and shape. Two bricks retaining traces of lime mortar and recovered from context {110}, part of the culvert are likely to be the product of the same kiln, and measure 220x110x65mm (weighing 3100g), and 210x100x60mm (weighing 2700g). The brick recovered from {210} is slightly larger, measuring 240x122x80mm and weighing 410g.

5.2.3 None of the bricks are frogged, and none have a makers stamp. The variation in brick size and shape may be due partly to shrinkage and warping in the kiln. It is likely that the bricks would have been locally made and probably date to the mid-18th to early 19th century (*Bushmann pers comm*).

5.2.4 Three fragments of CBM were recovered from <2> weighing 13g (Table 1). They

comprise one red fragment of similar to the bricks from {110}, and one reduced fabric with a salt-glazed stoneware combed surface. The remaining piece is a mid-orange fabric but too small to identify. All three fragments are likely to be 18th-19th century in date.

5.2.5 No further analysis is warranted.

5.3 Glass

5.3.1 30 glass fragments were recovered from environmental samples, weighing 11g (Table1).

5.3.2 All fragments are small but not particularly worn. The four pieces from (111) are unidentified but all have an iridescent residue from the ground conditions. The shards from (312) are all of clear glass comprising both window and vessel glass.

5.3.3 The glass fragments are likely to date to the 19th century.

5.3.4 No further analysis is warranted.

5.4 Pottery

5.4.1 Two sherds of pottery were recovered from the environmental sample.

5.4.2 A small sherd and fairly abraded of a medieval reduced greenware pottery with external green glaze was recovered from <1>. The sherd is likely to part of a jug dating to the 14th – 16th century (*Ellison 1981*).

5.4.3 A single sherd of refined white earthenware weighing 1g was recovered from <2>. The sherd is in good condition but is very small, and is probably part of a saucer or small plate dating to the 19th century.

5.4.4 No further analysis is warranted

5.5 Miscellaneous

5.5.1 A small fragment of rubber or bitumen was recovered from the environmental samples (111) <1> weighing 1g.

5.5.2 This may be part of early electrical wire covering or something similar.

5.5.3 No further analysis is warranted.

Context	Sample	Material	Qty	Wgt(g)	Comments
111	1	Glass	4	1	Tiny fragments - iridescent residue
111	1	Rubber?	1	1	Electric cable coating?

111	1	Pottery	1	1	Med pot - Reduced greenware
111	1	Mortar	12	11	Lime mortar
312	2	Pottery	1	1	Refined white earthenware
312	2	Glass	26	10	Clear glass - window and vessel
312	2	CBM	3	13	Brick fragments
Total			48	38	

Table 1: Artefacts recovered from environmental samples

5.6 Conclusions

5.6.1 The finds assemblage consists primarily of post-medieval bricks, likely to be mid-18th to 19th century in date.

5.6.2 While one pottery sherd indicates some medieval activity nearby, it is small and from a post-medieval context.

5.7 Statement of Potential

5.7.1 The brick assemblage is a limited sample of some the bricks used for buildings on site, and are therefore of local archaeological interest, however, this is of limited importance.

5.7.2 The late medieval pottery is of note, but is of low archaeological importance.

5.7.3 The finds will not therefore be retained with the archive.

6. ENVIRONMENTAL ANALYSES

6.1 Introduction

6.1.1 Two bulk environmental samples (45.5kg/37l) were taken during the course of an archaeological evaluation and watching brief at Stephenson Monument, Westgate Road, Newcastle upon Tyne. These were submitted for assessment along with hand-collected animal bone and shell. All industrial waste and fuel were recovered from the environmental samples.

6.1.2 This report presents the results of the assessment of the environmental remains in accordance with Campbell et al. (2011) and English Heritage (2008).

6.2 Methodology

6.2.1 The bulk environmental samples were processed at Wardell Armstrong. The colour, lithology, weight and volume of each sample was recorded using standard Wardell Armstrong pro forma recording sheets. cf. Table 1. The samples were processed with 500 micron retention and flotation meshes using the Siraf method of flotation (Williams 1973). Once dried, the residues from the retention mesh were sieved to 4mm and the artefacts and ecofacts removed from the larger fraction. The smaller fraction was scanned with a magnet in order to retrieve any micro-slugs such as hammerscales and examined for any artefacts and ecofacts, Table 2. The residues were subjected to a re-float in order to maximise any archaeobotanical yield, these second flots have not be examined for the purpose of this assessment.

6.2.2 The flot, plant macrofossils and charcoal were retained and scanned using a stereo microscope (up to x45 magnification). Any non-palaeobotanical finds were noted on the pro forma, Table 3.

6.2.3 The plant remains and charcoal were identified to species as far as possible, using Cappers et al (2006), Cappers and Bekker (2013), Cappers and Neef (2012), Hather (2000), Jacomet (2006) and Schoch et al. (2004) and the author's reference collection. Nomenclature for plant taxa followed Stace (2010) and cereals followed Cappers and Neef (2012).

6.3 Results

6.3.1 **Animal bone (Table 4):** Both the samples yielded animal bone (Table 3). Most of these were fragments of elements of indeterminate species with a distal end of a sheep (*Ovis*

- sp.) tibia being the only element identifiable to species and this was from <2>.
- 6.3.2 Hand-collected animal bone noted were, from **(107)**-deposit visible from in southern end of trench 1. There was a rib spine fragment from a small to medium sized mammal. Contexts from trench 2 were more yielding. Deposit **(206)** yielded a horn fragment (medium to large sized mammal), fragments from both large and medium sized mammals and a pig (*Sus* sp.) pelvis fragment with purple staining (which was thought to be taphonomic in origin).
- 6.3.3 A Trench 3 deposit **(308)**, which was the same as **(206)**, yielded a just-fused fragment of a cattle (*Bos* sp.) caudal vertebra. The remainder were fragments of long bone, indeterminate elements, along with a radius fragment, of large mammals.
- 6.3.4 Sample <1> **(111)**, fill within culvert **{108}**: This sample weighed 27.9kg (20l) and the pH level was 7.48. The majority of the artefactual material consisted of industrial waste although glass, pottery and plaster were also observed. Animal bone, shell and charcoal were also recovered. The flot contained a few uncharred plant remains, terrestrial molluscs, insect remains and charcoal fragments. Only a single fragment of charcoal was large enough to be identified to species; hazel (*Corylus avellana*) (Table 5).
- 6.3.5 Sample <2> **(312)** fill of culvert **{309}**: This sample weighed 17.6kg (17l) and had a pH level of 7.82. The artefactual material was similar to that of the previous sample. The flot contained similar material, though it also yielded a few charred plant material including a charred seed of grape (*Vitis vinifera*).
- 6.3.6 **Molluscs (Table 6)**: Sample <1> yielded only marine molluscs (common mussel (*Mytilus edulis*) and thin tellin (*Angulus tenuis*), although terrestrial molluscs have been observed within the flot.
- 6.3.7 Sample <2> contained common mussel and cockle (*Parvicardium scabrum*) with some terrestrial shell noted visible within the flot.
- 6.3.8 Hand-collected shell from **(206)** were oyster (*Ostrea edulis*) and common cockle (*Cerastoderma edule*).
- 6.3.9 **Industrial waste (Table 7)**: All the industrial waste and fuel (Table 8) were from the samples and both contained similar material. Some plate and spherical hammerscale were observed in both the flots and the magnetic matter. Slag fragments were

observed in <1> with the industrial waste in <2> having the appearance of laminated rust.

6.4 Discussion

6.4.1 The lack of cut marks on the animal bone and the small quantity yielded limited any potential discussion on butchery techniques. The just fused cattle caudal vertebrae indicated that this was a beast that would have been a relatively young adult.

6.4.2 The paucity of charred plant remains limited further discussion with regards to the plants but the presence of a single charred grape seed was interesting, however, given the unknown date for the feature nothing meaningful could be discerned.

6.4.3 The presence of mostly marine molluscs could be attributed to food waste as all were edible.

6.4.4 The industrial waste probably represents general midden waste, especially when considered with the ecofactual material.

6.5 Statement of Potential and Recommendations

6.5.1 Further work could be undertaken on all the ecofactual assemblage but the quantity and preservation of the remaining unidentified material would not enhance the data already observed. The industrial waste may be discarded as can all the ecofactual material.

6.5.2 Because the slightly alkaline pH levels recorded in the samples and the reasonable preservation of the ecofactual material indicates that there is potential for the retrieval of environmental remains from the area therefore further archaeological interventions nearby in accordance with a sample strategy should occur within the area then a sample strategy should be implemented for the recovery of environmental remains.



Table 2: Sample data

C	<>	pH	CP	TP	MP	PW	PV	CS	TS	Components (sorting)	A	SA	SR	R	SW	SV
111	1	7.48	Dark brownish black	Loose	Clayey silt	27.9	20	Yellowish brown	Loose	Stone>1cm 30%: stone<1cm 40%: sand 30%	-	yes	-	-	3600	2200
312	2	7.82	Dark brownish black	Loose	Clayey silt	17.6	17	Reddish brown	Loose	Stone>1cm 30%: stone<1cm 30%: sand 40%	-	yes	-	-	5650	4000

Key: C=context, <>=sample number, CP=colour of pre-processed sediment, TP=texture of pre-processed sediment, MP= matrix of pre-processed sediment, PW=weight (g) of pre-processed sediment, PV=volume (l) of pre-processed sediment, CS= colour of dried sediment, TS=texture of dried sediment, A,SA,SR and R= A=angular, SA= sub-angular, SR=sub-rounded, R= rounded relate to the angularity of the stone present, SW= weight (kg) of dried residue, SV-volume (ml) of dried residue

Table 3: Finds from sample data (weight (g) only)

C	<>	Animal bone	Calcined bone	shell	pottery	Plaster	MM>4	MM<4	Coal	Cinder	Ind waste	Glass	Rubber	CBM
111	1	15	1	7	2	11	17	36	87	28	2	1	-	
312	2	26	-	2	1	195	66	56	72	27	11	-	14	

Key: C= context, <>= sample number, MM>4= magnetic matter from the >4mm fraction, MM<= magnetic matter from the <4mm fraction



Table 4: Flot data

C	<>	Weight (g)	Description	Comments
111	1	13.33	Sand 50%: industrial waste 40%: very fine rootlets 10%	some uncharred plant remains, terrestrial molluscs, insect remains and charcoal fragments
312	2	35.81	Industrial waste 45%: sand 40%: ecofacts 15%	uncharred plant remains, industrial waste, coal, charred plant remains (including <i>Vitis vinifera</i>), spherical hammerscale, mollusc shells, charcoal, insect remains

Key: C= context, <>= sample number

Table 5: Animal bone

C	<>	W(g)	Qty	Species	Element	Comments	preservation	Cut marks?
107	HC	2.9	1	small to medium sized mammal	rib spine	fragment	poor to good	no
111	1	14.9	-			large element fragments, also includes a single bird bone	poor to good	no
111	1	1	3	indet.	indet.	calcined fragments	poor	no
206	HC	18	1	medium to large mammal	horn	fragment	poor to good	
206	HC	15	1	large mammal	-	fragment	poor	no
206	HC	11.2	1	medium sized	rib	fragment	poor	no
206	HC	167.9	1	<i>Sus</i> sp.	pelvis	fragment, with purple staining	poor to good	no
308	HC	31.7	1	cf. <i>Bos</i> sp.	caudal vertebrae	just fused	poor to good	no
308	HC	5.7	1	large mammal	long bone	fragment	poor to good	no
308	HC	6.1	1	large mammal	long bone	fragment	poor to good	no

308	HC	11.1	1	large mammal	long bone	distal, unfused fragment, abraded	poor to good	no
308	HC	20	1	large mammal	radius	fragment	poor to good	no
312	2	26	-	indet.		fragments	poor	no
312	2		1	<i>Ovis</i> sp.	tibia	fragment, distal end	good	yes

Key: C= context, <>= sample number (HC refers to hand-collected), W(g)= weight (g)

Table 6: Charcoal

C	<>	Species	AMS?
111	1	<i>Corylus avellana</i> (Hazel)	yes

Key: C= context, <>= sample number, AMS?= potential for AMS

Table 7: Shell

C	<>	qty	Binomial	comments
111	1	2	<i>Mytilus edulis</i>	fragments-no umbo
111	1	1	<i>Angulus</i> sp.	fragments-no umbo
111	1	1	indet.	apex only
312	2	6	<i>Mytilus edulis</i>	fragments
312	2	2	<i>Parviradium minimum</i>	fragments
206	HC	1	<i>Cerastoderma edule</i>	
206	HC	3	<i>Ostrea edulis</i>	right valve very abraded

Key: C= context, <>= sample number (where HC is stated this refers to hand-collected)

Table 8: Industrial waste data

C	<>	Material	</> 4mm	Weight (g)	notes
111	1	cinder		87.2	
111	1	coal		35.7	
111	1	industrial waste		28	
111	1	magnetic matter	<4mm	16.8	slag fragments
111	1	magnetic matter	>4mm	17.4	slag fragments
312	2	cinder		71.8	
312	2	coal		55.8	
312	2	industrial waste		26.8	
312	2	magnetic matter	<4mm	66.3	contains some plate and spherical hammerscale along with fragments of slag
312	2	magnetic matter	>4mm	194.6	laminated fragments of rust

Key: C=context, <>= sample number, </> 4mm= less than/ greater than 4mm mesh fraction

7. CONCLUSIONS

7.1 Interpretation

7.1.1 Archaeological remains were found in 3 trenches. The remains were extended across the carriageway side of the site. The data recovered indicated past activity on the site dating from the mid-18th – 19th century to the present. This activity was represented by two brick lined culverts, a brick built oval-shaped vertical shaft and the remains of three walls that may have been cellars. There were numerous modern services that cut across the site along with a concrete pad associated with a recently demolished office building next the former Chronicle building / Union Rooms pu.

7.1.2 The survival of the archaeological features was good in the intact sections that were not cut by the numerous modern services. Survival had been influenced by later phases of development as the features were cut by numerous modern services in both the carriageway and the traffic island.

7.2 Significance

7.2.1 No evidence of the Hadrian's Wall, the wall ditch or any pre-post medieval were observed during the archaeological evaluation and watching brief. Only the remains of two brick lined culverts, a possible brick lined vertical sewer shaft and three walls of possible cellars were observed dating to the 19th century. In the context of the investigation they provide little archaeological value. Though they are deep enough that they won't be affected by the proposed scheme and will be preserved in situ.

7.3 Recommendations

7.3.1 As the site lies within the assumed line of Hadrian's Wall, the potential presence of the wall and associated ditch along with possible medieval archaeology is significant and any disturbance should be mitigated against through preservation in situ or targeted excavation.

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Pers Comm

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APPENDIX 1: TRENCH DESCRIPTIONS

Trench 1

Length: 7.10m Width: 1.75m Orientation: North-northeast – South-southwest
 Average Depth: 0.54m Maximum Depth: 1.30m

Context Number	Context Type	Description	Height/Depth	Discussion
(100)	Surface	Black Tarmac	0.09m	Existing road surface
(101)	Deposit	Concrete	0.18m	Concrete base for tarmac surface = (202), (306), (402), (502)
(102)	Deposit	Firm mid brown grey clay.	0.50m	Modern deposit that covers culvert {108} = (205) and (307)?
(103)	Deposit	Firm yellow brown sandstone	0.05m	Thin band of crushed sandstone/ dolomite
(104)	Deposit	Light yellow brown dolomite/ rubble mix	0.28m	Backfill layer
(105)	Deposit	Dark grey silty clay	0.15m	Lowest deposit visible in the trench
(106)	Deposit	Red brown sandy clay with dark brown clay lenses	0.34m	Deposit = (206) and (308)
(107)	Deposit	Firm dark brown silty clay	0.22m	Deposit visible in southern end of the trench only
{108}	Structure#	Culvert	0.33m	18 th – 19 th century brick lined culvert
{109}	Masonry	Sandstone capping	0.06m	Capping stones for culvert {108}
{110}	Masonry	Red brick walls	0.27m	Brick walls forming the channel of culvert {108}
(111)	Deposit	Loose dark brown grey silty clay	0.24m	Fill within culvert {108}
(112)	Surface	Red Tarmac	0.08m	Earlier road surface
(113)	Deposit	Mid grey sub base	N/A	Fill of modern service trench
[114]	Cut	Construction cut for culvert {108}	N/A	Truncated cut of culvert {108}
{115}	Masonry	Sandstone slabs	0.05m	Sandstone of culvert {108}

Trench 2

Length: 7m Width: 1.50m Orientation: North-northeast – South-southwest
 Average Depth: 1m Maximum Depth: 1.50m

Context Number	Context Type	Description	Height/Depth	Discussion
(200)	Surface	Black Tarmac	0.17m	Existing road surface
(201)	Surface	Red Tarmac	0.11m	Earlier road surface
(202)	Deposit	Mid grey concrete	0.24m	Concrete base for tarmac surface = (101), (306), (402), (502)
(203)	Deposit	Firm yellow brown dolomite rubble	0.12m	Backfill layer associated with nearby modern services
(204)	Deposit	Mid grey silty clay	0.15m	Backfill layer associated with nearby modern services
(205)	Deposit	Loose black silty clay	0.20m	Layer possibly similar to (102) and (307)
(206)	Deposit	Mid red brown sandy clay with lenses of dark brown clay	0.60m	Deposit = (206) and (308)
{207}	Masonry	Sandstone wall	0.50m	Possible cellar wall at south end of the trench
[208]	Cut	Cut for brick structure {210}	0.90m	Construction cut for a possible sewer shaft
(209)	Deposit	Loose mid brown silty clay	0.90m	Backfill of [208]
{210}	Masonry	Red brick structure	c.6m	Possible vertical sewer shaft
{211}	Masonry	Red brick wall	0.5	Possible cellar wall in the north end of the trench
(212)	Deposit	Firm light to mid-brown clay	1m	Modern backfill layer
{213}	Masonry	Red brick footing	0.25m	Part of {215}
{214}	Masonry	Sandstone blocks	0.40m	Part of {215}
{215}	Structure#	Consists of {213} and {214}	0.65m	A possible cellar wall consisting of red brick footing with sandstone blocks laid on top

Trench 3

Length: 13.15m Width: 0.70 – 0.90m Orientation: North – South
 Average Depth: 0.75m Maximum Depth: 1.01m

Context Number	Context Type	Description	Height/Depth	Discussion
(300)	Surface	Mid grey concrete	0.07m	Paving slabs
(301)	Deposit	Loose mid brown sandy clay	0.18m	Modern backfill layer
{302}	Structure	Concrete	N/A	Modern concrete pad & rebar
(303)	Deposit	Loose light brown sand	0.05m	Bedding layer for (300)
(304)	Deposit	Firm yellow brown dolomite rubble	0.90m	Modern backfill layer
(305)	Surface	Black Tarmac	0.10m	Existing road surface
(306)	Deposit	Mid grey concrete	0.21m	Concrete base for tarmac surface = (101), (202), (402), (502)
(307)	Deposit	Dark grey/ black sandy clay	0.21m	Layer possibly similar to (102) and (205)
(308)	Deposit	Mid red brown sandy clay with lenses of dark brown clay	0.28m	Deposit = (106) and (206)
{309}	Structure#	A culvert consists of {310}, {311}, (312), [314]	0.7m	Red brick lined 18 th – 19 th century culvert
{310}	Masonry	Red brick	0.60m	Red brick floor and walls of {309}
{311}	Masonry	Sandstone slabs	0.10m	Capping stones of {309}
(312)	Deposit	Loose dark brown sandy clay	0.38m	Fill of culvert channel {309}
(313)	Surface	Red Tarmac	0.18m	Earlier road surface
[314]	Cut	Cut of culvert {309}	N/A	Construction cut of culvert though not visible

Test Pit 1

Length: 1.50m Width: 1.40m Orientation: North-northwest – South-southeast
 Average Depth: 0.50m Maximum Depth: 0.70m

Context Number	Context Type	Description	Height/Depth	Discussion
(400)	Surface	Black tarmac	0.10m	Upper layer of the road = (100), (200), (300), (500)
(401)	Surface	Red tarmac	0.06m	Earlier road surface = (112), (201), (313) (501)
(402)	Deposit	Mid grey concrete	0.18m	Concrete base for tarmac = (101), (202), (306), (502)
(403)	Deposit	Loose grey brown silty sand	0.11m	Possible levelling layer for concrete
(404)	Deposit	Firm yellow brown dolomite rubble fill	0.40m	Infill of a modern service trench
(405)	Deposit	Firm brown grey clay	c.0.3m	Lowest layer visible within the trench. Extent was unclear

Test Pit 2

Length: 1.56m Width: 1.40m Orientation: East – West
 Average Depth: 0.18m Maximum Depth: 0.18m

Context Number	Context Type	Description	Height/Depth	Discussion
(500)	Surface	Black tarmac	0.10m	Black tarmac = (100), (200), (305), (400)
(501)	Topsoil	Red tarmac	0.08m	Red tarmac = (112), (201), (313), (401)
(502)	Deposit	Mid grey concrete	N/A	Concrete base for tarmac = (101), (202), (306), (402)

APPENDIX 2: PLATES



Plate 1; Trench 1, looking southwest (1m scale)



Plate 2; Northern half of Trench 1, looking west-northwest (1m scale)



Plate 3; Southern half of Trench 1, looking north-northwest (1m scale)



Plate 4; Culvert {108}, looking south-southwest (1m scale)



Plate 5; Culvert {108} with capping stones removed, looking north (1m scale)



Plate 6; Trench 2, looking northwest (1m scale)



Plate 7; Southern end of Trench 2 showing structure {207}, looking north-northwest (1m scale)



Plate 8; Southern end of Trench 2 showing wall {215}, looking south-southeast (1m scale)



Plate 9; Northern end of Trench 2, showing wall {211}, looking north-northwest (1m scale)



Plate 10; Structure {210} with covering kerb stones in situ, looking northwest (1m scale)



Plate 11; Structure {210}, capping stones removed showing bricked up opening, looking northwest (1m scale)



Plate 12; Trench 3, looking north (1m scale)



Plate 13; Culvert {309}, looking southwest (30cm scale)



Plate 14; Test pit 1, looking north-northwest (1m scale)

APPENDIX 3: FIGURES






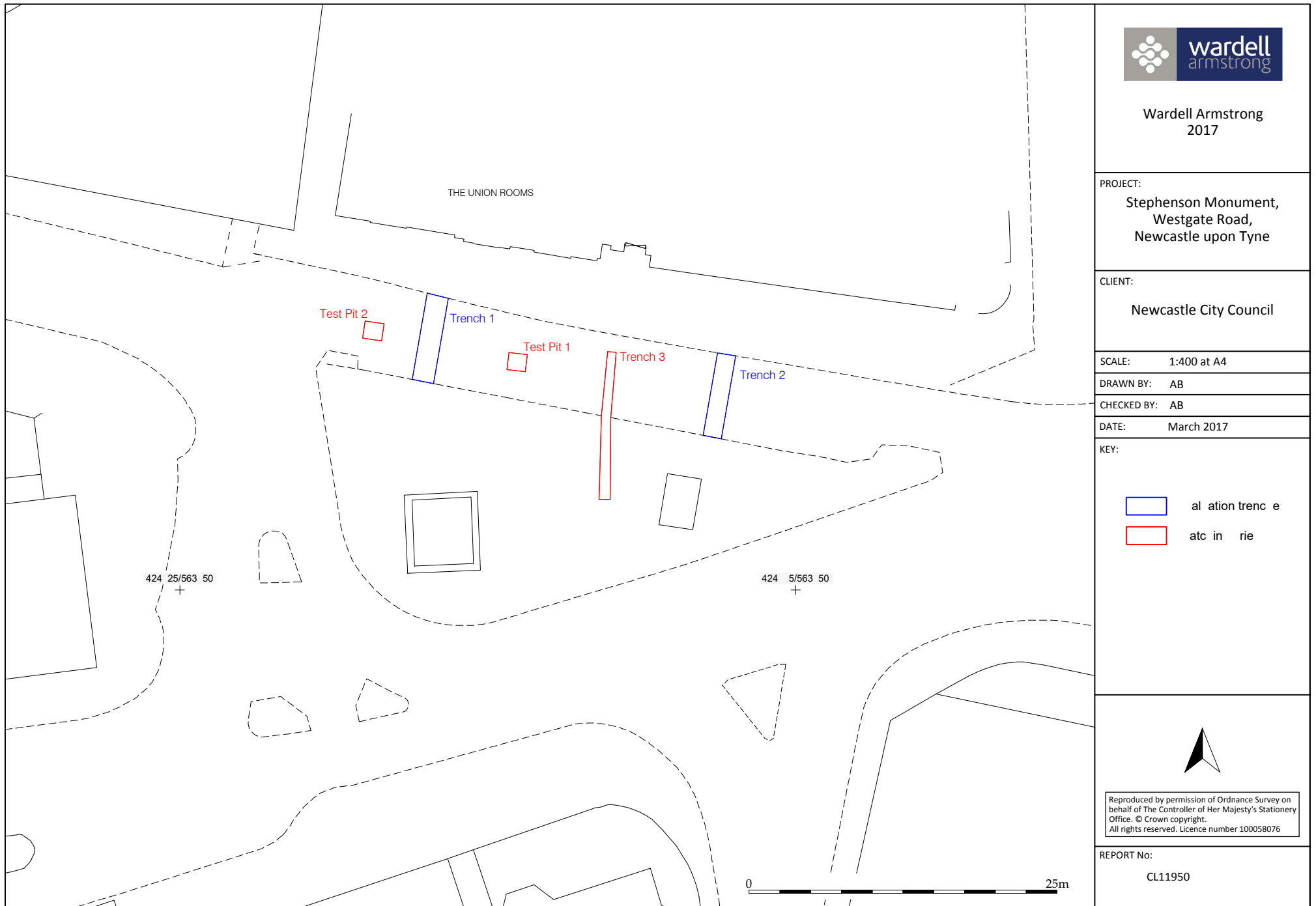
 <p>Wardell Armstrong 2017</p>	<p>PROJECT: Stephenson Monument, Westgate Road, Newcastle upon Tyne</p> <p>CLIENT: Newcastle City Council</p> <p>SCALE: 1:25,000 at A4</p> <p>DRAWN BY: AB</p> <p>CHECKED BY: AB</p> <p>DATE: March 2017</p> <p>REPORT No: CL11950</p>	<p>KEY:</p> <p> Site location</p>	 <p>Reproduced by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office. © Crown copyright. All rights reserved. Licence number 100058076</p>
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Figure 1: Site location.



Wardell Armstrong
2017

PROJECT:
Stephenson Monument,
Westgate Road,
Newcastle upon Tyne

CLIENT:
Newcastle City Council

SCALE: 1:400 at A4

DRAWN BY: AB

CHECKED BY: AB

DATE: March 2017

KEY:

evaluation trench

test pit



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REPORT No:
CL11950

Figure 2: Location of evaluation trenches.

PROJECT:
Stephenson Monument,
Westgate Road,
Newcastle upon Tyne

CLIENT:
Newcastle City Council

SCALE: Plan 1:50/Sections 1:25 at A3

DRAWN BY: HP

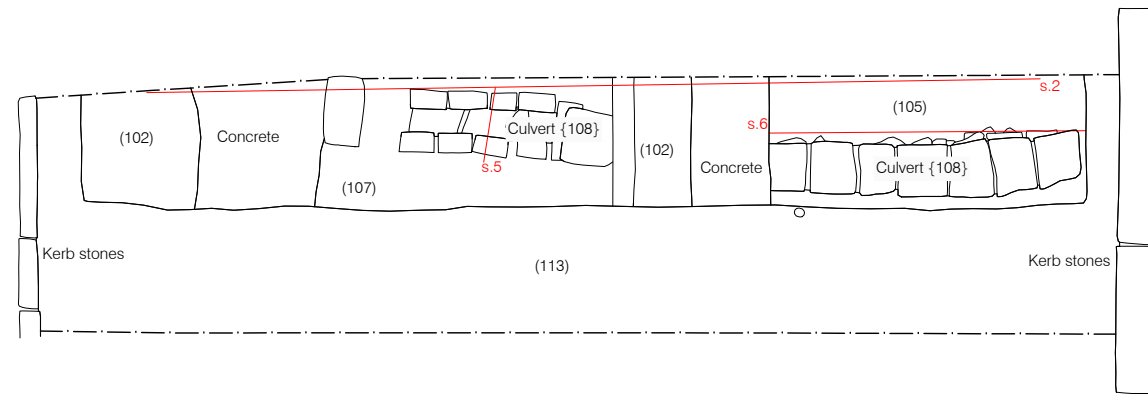
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DATE: March 2017

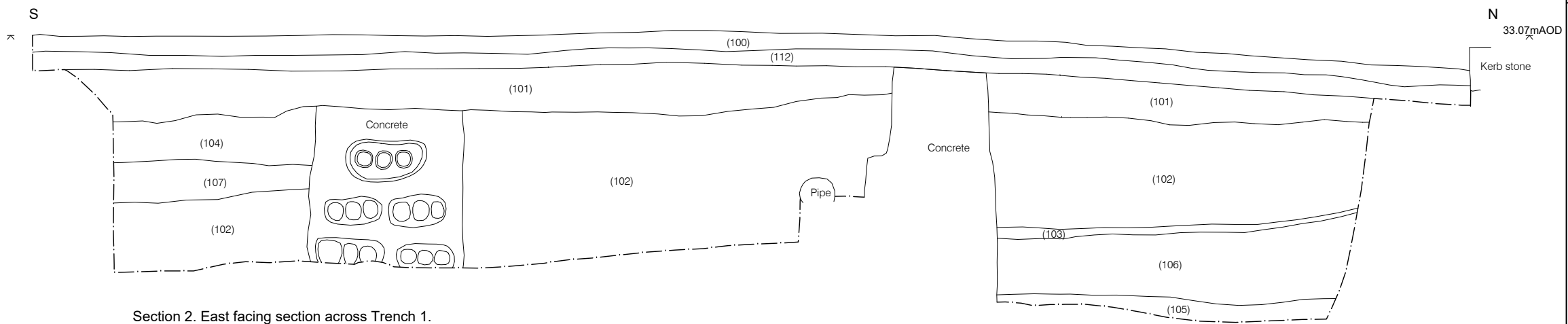
KEY:

- (101) Context number
- Height mAOD
- Section location
- Limit of excavation

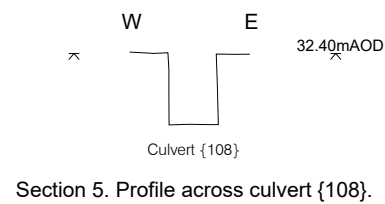
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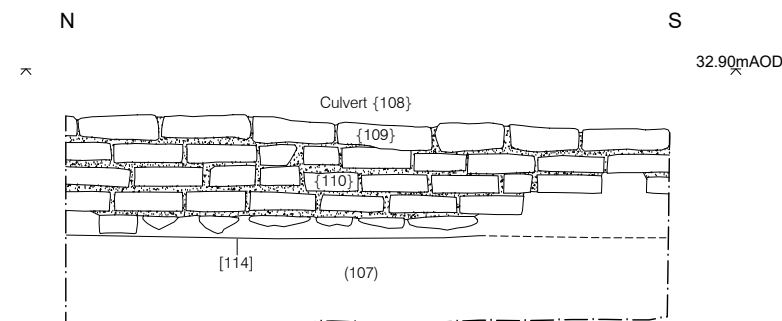
Trench 1. Plan.



Section 2. East facing section across Trench 1.



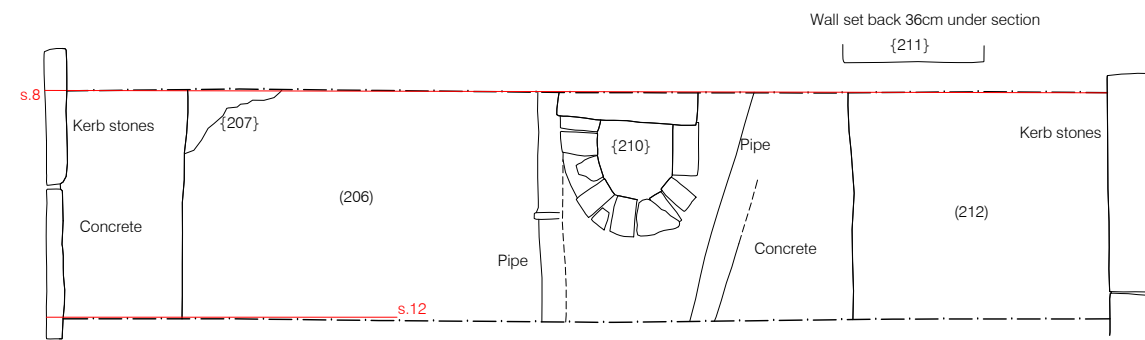
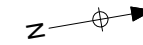
Section 5. Profile across culvert {108}.



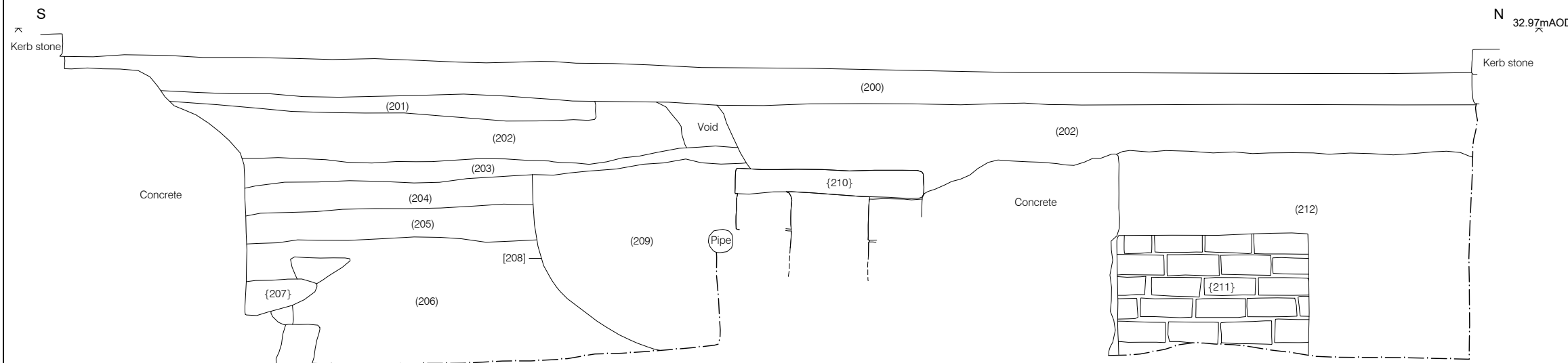
Section 6. West facing elevation of culvert {108}.



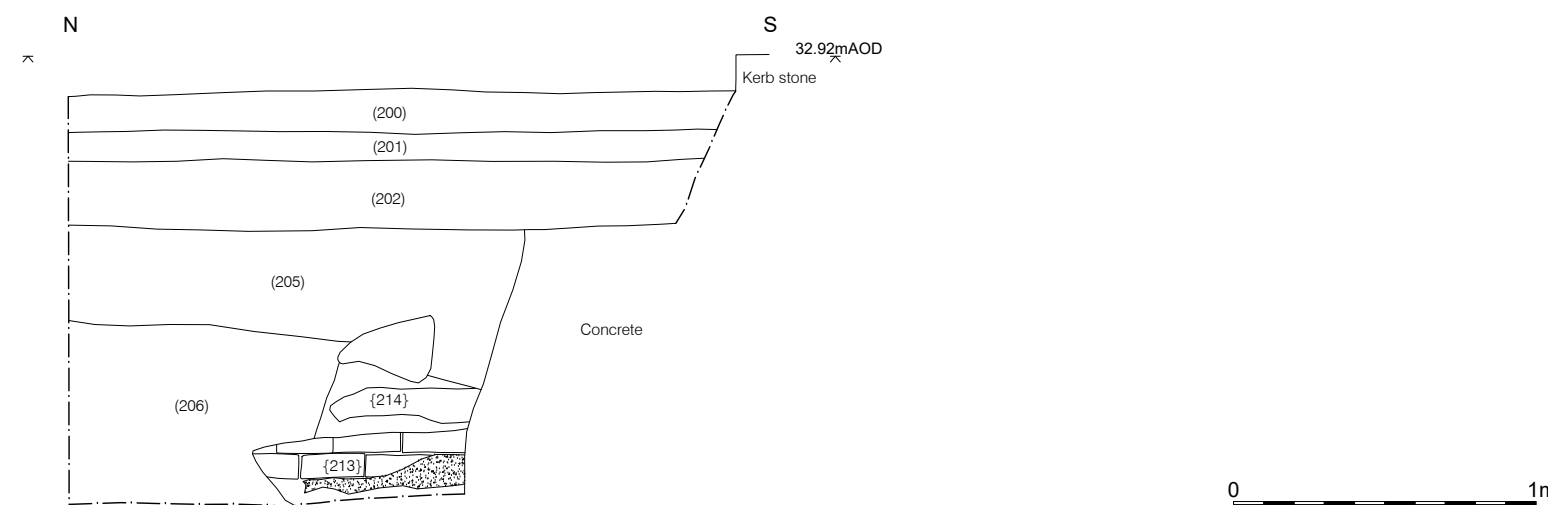
Figure 3: Trench 1, plan and sections.



Trench 2. Plan.



Section 8. East facing section across Trench 2 showing {207}, [208], {210} and {211}.



Section 12. West facing section across culvert {213} and {214}.



Figure 4: Trench 2, plan and sections.



Wardell Armstrong
2017

PROJECT:
Stephenson Monument,
Westgate Road,
Newcastle upon Tyne

CLIENT:
Newcastle City Council





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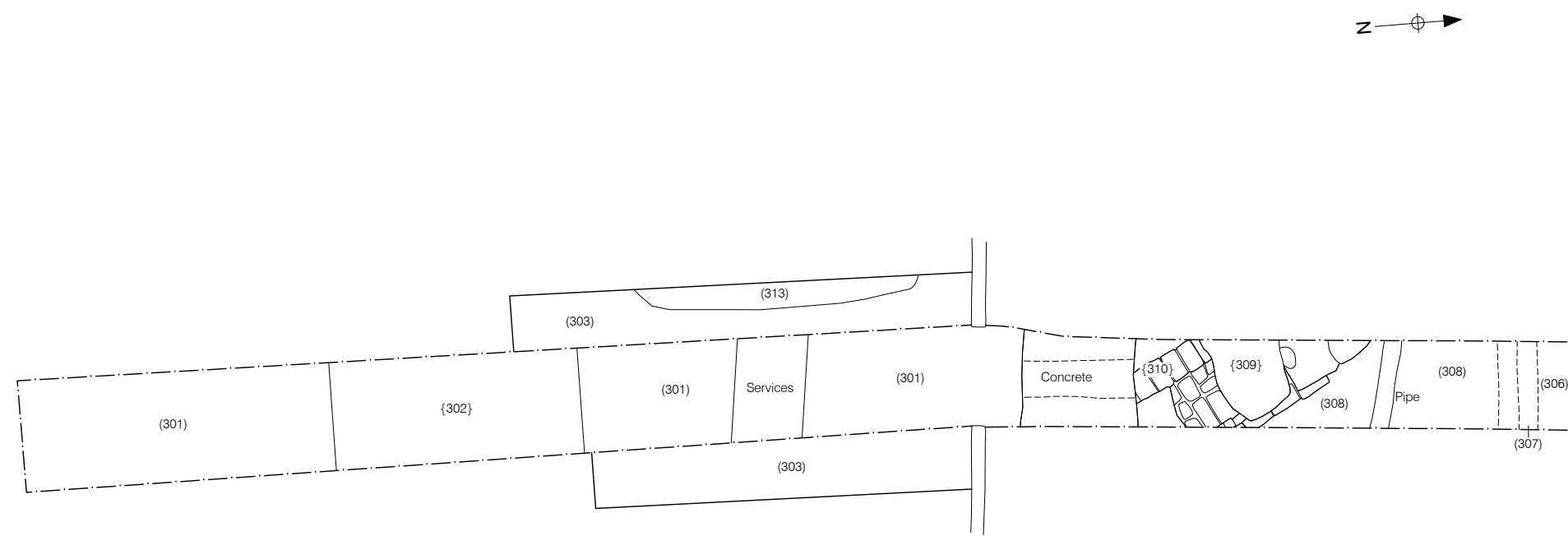
CHECKED BY: AB

DATE: March 2017

KEY:

-  Context number
-  Height mAOD
-  Section location
-  Limit of excavation

REPORT No:
CL11950



Trench 3. Plan.

0 2m

Figure 3: Trench 3, plan.

APPENDIX 4: SPECIFICATION

Tyne and Wear Archaeology Service

Specification for Preliminary Archaeological Evaluation and Watching Brief at Stephenson Monument, Newcastle upon Tyne

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Claire.macrae@newcastle.gov.uk

Date: January 2017

Reference Number: MON14771

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 Development Management division of the Investment & Development Directorate of

Introduction

Site grid reference: NZ2467 6398

A new public realm scheme around the Stephenson Monument traffic island has been proposed. The island sits on the line of Hadrian's Wall, a UNESCO World Heritage Site. Frontier archaeology is known to exist in undisturbed pockets throughout this area. In addition, the site may contain archaeological deposits or features relating to the medieval graveyard of St. John.

The proposed scheme includes resurfacing work, the installation of seating/planters and interpretation relating to the assumed line of Hadrian's Wall.

An archaeological evaluation comprising of two trenches will need to take place in the areas of the deepest proposed excavation (indicated on the plan). In addition a watching brief will be required when site investigation takes place to locate services and check ground conditions. This is expected to be needed to cover 3 additional trenches. The exact location of these exploratory pits will be provided by the client.

There has been a substantial amount of archaeological work in the vicinity of Stephenson's Monument. Parts of the ditch were observed in 1929 in the vicinity of proposed trench 1 (see AA (4), XI, 227-233). In modern times this has largely been confined to watching briefs on and around the traffic island which have rarely produced archaeological features.

However, a series of evaluation trenching and watching briefs undertaken in 2013-2014 revealed what may be part of the wall core on the western edge of the traffic island (HER 2015/171) (close to proposed trench 1). In 2016 the line of Hadrian's Wall was further established in the area outside of the Lit and Phil building.

The appointed archaeologist must familiarise themselves with the results of previous archaeological work on the site before starting work.

In accordance with paragraph 141 of the National Planning Policy Framework, two evaluation trenches and a watching brief during site investigations by the developer will be required.

Research Aims and Objectives

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

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

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

For the Historic England Research Agenda see <https://historicengland.org.uk/images-books/publications/eh-research-agenda/>

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

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

Methods statement

Two evaluation trenches are needed to inform the Planning Authority of the character, nature, date, depth, degree of survival of archaeological deposits on this site. The excavation must be carried out by a suitably qualified and experienced archaeological organisation. The work will record and environmentally sample any archaeological deposits of importance found on the plot. The purpose of this brief is to obtain tenders for this work. The report must be the definitive record for deposition in the Tyne and Wear HER, and it must contain recommendations for any further archaeological work needed on this site.

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

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

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

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

Notification

The Tyne and Wear Archaeology Officer (AO) needs to know when archaeological fieldwork is taking place in Tyne and Wear so that he can inform the local planning authority and can visit the site to monitor the work

in progress. The Archaeological Contractor must therefore inform the AO of the start and end dates of the Evaluation. He must also keep the AO informed as to progress on the site. The AO must be informed of the degree of archaeological survival and of any significant finds. The Client will give the AO reasonable access to the development to undertake monitoring.

PROJECT INITIATION

PROJECT DESIGN

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

HEALTH AND SAFETY AND RISK ASSESSMENT

A health and safety statement and risk assessment, identifying potential risks in a risk log (see template in appendix 2 of The MoRPHE Project Manager's Guide) and specifying suitable countermeasures and contingencies, is required to be submitted to the commissioning client.

See appendix 1 for more information.

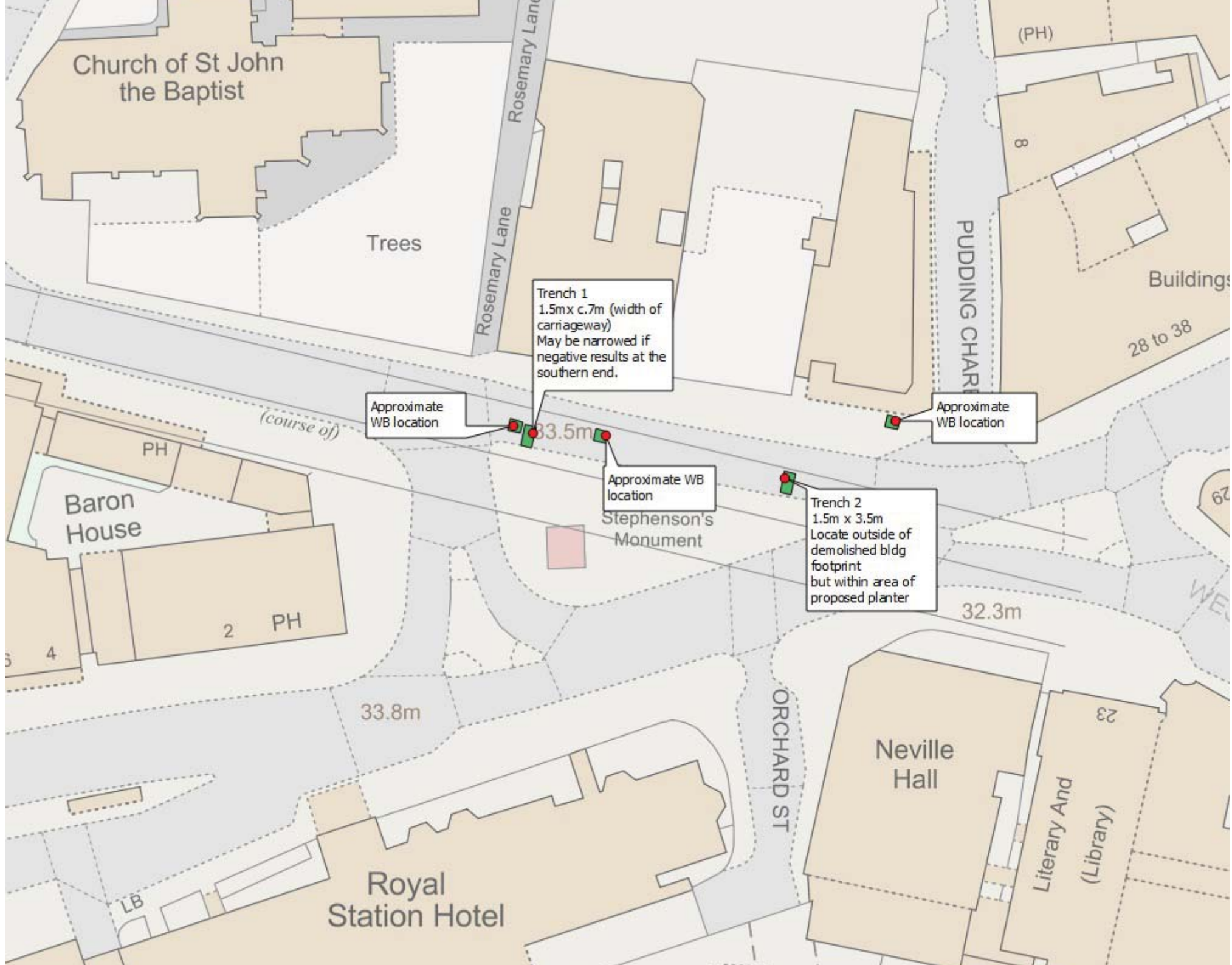
PROJECT EXECUTION

1) Archaeological evaluation and watching brief

The two evaluation trenches (Ref. Trench 1 and 2) are shown on the accompanying plan in the approximate locations of the proposed planter and tree areas. Trench 1 should be 1.5m x 7m across the full width of the existing Westgate Road carriageway between the kerb lines (at the request of Newcastle City Council). This trench should begin at the southern end closest to Stephenson's Monument adjacent to where the possible remains of Wall core were located in 2014. If the results of this trench prove negative the trench can be narrowed to 1m for the final c.3.5m to the northern kerb stone. The dimensions of Trench 2 should be 1.5m x 3.5m in plan at base. Trench 2 should be placed outside of the footprint of the previous building which extended to the traffic island but needs to be within the area of the proposed planter.

The location of evaluation trenches 1 and 2 can be adjusted slightly to avoid services or for practical or safety reasons but must serve their purpose in evaluating archaeological potential in the areas of the deepest proposed scheme excavations (1.35m).

A watching brief must be carried out during investigative works in areas indicated on the plan (Ref WBP1, WBP2 and WBP3). These trenches have been plotted based on information provided by Southern Green. The size of these trenches will be determined by the client's representative, Southern Green, depending on their needs.



Church of St John the Baptist

Trees

Rosemary Lane

Trench 1
1.5m x c.7m (width of carriageway)
May be narrowed if negative results at the southern end.

Approximate WB location

33.5m

Approximate WB location

Stephenson's Monument

Approximate WB location

Trench 2
1.5m x 3.5m
Locate outside of demolished bldg footprint but within area of proposed planter

32.3m

Baron House

2 PH

33.8m

Royal Station Hotel

ORCHARD ST

Neville Hall

Literary And (Library)

23

Buildings

28 to 38

(PH)

PUDDING CHAR

60

WE

These locations will be determined using the data obtained from the 3 watching brief pits which are being undertaken to determine the exact location and depth of the statutory undertakers' apparatus.

The appointed archaeologist **must** be able to get into the trench to plan, photograph and sample excavate any archaeological features which are found. In order to do this safely, the appointed archaeologist can only enter the excavation when authorised to do so by an attending NCC operative who has been trained in excavation works. **When the Evaluation Trench exceeds 0.75m below present ground level, an attending NCC manager who has been trained in excavation works must risk assess the excavation.** (This is a Newcastle City Council requirement). Where shoring is required a maximum depth of 300mm at the base of the trench will be allowed to be exposed before the shoring is lowered.

NCC's contractor will be responsible for the protection and security of the working area at all times. The appointed archaeologists must follow any instructions issued by NCC with regards to the protection of the working area.

NCC's contractor will be responsible for traffic and pedestrian management associated with the working areas.

Due to the short duration of the works, no site welfare facilities will be provided.

NCC's contractor on site working hours are Monday to Thursday - 08:00 to 15:30 and Friday – 08:00 to 12:30. These are the only times the evaluation trenches and watch brief pits will be available for excavation and inspection.

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

Tasks

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

- A Removal of the modern bound carriageway material will be undertaken without a watching brief. NCC's contractor to undertake these excavation works.
- B Any modern overburden or levelling material can be machined-off using a wide toothless ditching bucket. NCC's contractor to undertake excavation works under strict archaeological supervision (Watching Brief)
- C Remaining deposits are to be excavated by hand by appointed archaeologist under supervision of NCC with regards to excavation safety. See archaeological evaluation and watching brief, para 5.

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

All faces of the trench that require examination or recording will be cleaned in line with paragraph 5 regarding risk assessment/trench depth in section 1 (archaeological evaluation and watching brief) above.

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

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

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

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

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

Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Don O’Meara, Historic England Regional Advisor for Archaeological Science (don.o'meara@historicengland.org.uk) **before** the evaluation begins. See Appendix 1 for more information.

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

See Appendix 4 for guidance on Treasure Act procedures.

NCC’s contractor shall be responsible for the reinstatement of the excavated trenches. The spoil can be kept close-by and used to backfill the trenches at the conclusion of this work in accordance with NCC’s standard compaction requirements.

Recording

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

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

Use of digital cameras

Use a camera of 10 megapixels or more.

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

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

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

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

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

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

Post photography processing:

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

Post photography processing workflow for RAW images:

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

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

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

Edit in 'Imaging' software such as Photoshop – tonal adjustments (colour, contrast) can be made. Rotate images where necessary, crop them to take out borders,

clean the images to remove post-capture irregularities and dust. Check for sensor dust at 100% across the whole image.

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

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

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

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

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

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

For more guidance on digital photography:

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

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

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

IFA, Guidance on the use and preservation of digital photographs

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

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

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

Printing the images:

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

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

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

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

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

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

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

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

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

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

Plans and drawings

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

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

The plans will depict building material (i.e. brick and stone) where a complex of structures has been found. Recent Historic England guidance “Drawing for Understanding” should be consulted to advise on recommended format presentations for such work (Historic England 2016a, 35-57).

Where there is a complex of interlocking multi-phased structures, a phasing plan will also be included.

There will be elevation drawings of any standing structures such as walls.

Pro-forma context sheets will be used.

All deposits and the base of the trench will be levelled. Levels will be expressed as metres above Ordnance Datum.

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

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

2) Post-excavation and report production

Finds Processing and Storage

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

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

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

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

Human and animal bone assemblages should be assessed by a recognised specialist (see Appendices 2 and 3 for more information).

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

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

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

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

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

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

Advice can be sought from Don O'Meara of Historic England where necessary. It is advisable to discuss potential scientific analysis at all stages of the project to allow

for clear planning and understanding between the contractor, the client, and the local authority archaeologist.

All objects must be stored in appropriate materials and conditions to ensure minimal deterioration. Advice can be sought from Don O'Meara of Historic England where necessary.

PRODUCTS

The report

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

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

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

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

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

- for deposition in the County HER at the address on the first page.

Four digital copies (pdf) must be submitted:

- one for the commissioning client

- one for the planning authority (Newcastle council) – this must be formally submitted by the developer to the planning department with the appropriate fee.

one for deposition in the County HER. This CD will also include all of the digital images as TIFFs and the accompanying metadata.

The report and 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.

- one for Mike Collins, Historic England’s Hadrian’s Wall Archaeologist (Bessie Surtees House, 41-44 Sandhill, Newcastle upon Tyne NE1 3JF)

Publication

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

Before preparing a paper for publication, the archaeological contractor must discuss the scope, length and suitable journal with the County Archaeologist.

Archive Preparation and Dissemination

The archive should be a record of every aspect of an archaeological project – the aims and methods, information and objects collected, results of analysis, research, interpretation and publication. It must be as complete as possible, including all relevant documents, records, data and objects (Brown, 2007, 1).

The site archive (records and materials recovered) should be prepared in accordance with:

- “Archaeological Archives – A guide to best practice in creation, compilation, transfer and curation” (Brown 2011)
- “Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives” (CIfA 2014).

Documentary Archive

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

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

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

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

Do not fold documents

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

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

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

Do not ink over original pencil drawings.

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

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

Store documents flat.

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

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

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

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

Material Archive

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

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

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

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

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

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

Use tie-on rot-proof labels where necessary.

Bulk finds of the same material type, from the same context, may be packed together in stable paper or polythene bags. It is advisable to seek advice from a specialist, or the Historic England Regional Science Advisor on the retention policy for large volumes of material, such as slag remains. Advice should be sought on the retention of a suitable subsample of material (rather than 100% retention) as per Historic England recommendations.

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

Use permanent ink on bags and labels.

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

The archive will be placed in a suitable form in the appropriate museum Great North Museum: Hancock or Tyne and Wear Museums.

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

Digital Archive

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

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

Archaeology Data Service

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

Archaeology Data Service

Department of Archaeology
University of York
King's Manor
York
YO1 7EP
01904 433 954

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

SIGNPOSTING

OASIS

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

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

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

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

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

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

The tender

Tenders for the work should contain the following:-

1. Brief details of the staff employed and their relevant experience
2. Details of any sub-contractors employed
3. A quotation of cost, broken down into the following categories:-
 - * Costs for the excavation, incl. sub-headings of staff costs on a person-day basis, transport, materials, and plant etc.

- * Post-excavation costs, incl. storage materials
 - * Cost of Environmental analysis and scientific dating per sample
 - * Estimated cost for full publication of results in an archaeological journal
 - * Overheads
4. An indication of the required notification period (from agreement to start date) for the field-work; the duration of fieldwork and the expected date for completion of the post-excavation work (a maximum of 6 months after completion of the fieldwork)

Monitoring

The Archaeological Contractor will inform the Tyne and Wear Archaeology Officer (AO) of the start and end dates of the excavation to enable the CAO to monitor the work in progress.

Should important archaeological deposits be encountered, the AO must be informed. If further archaeological evaluation is required on this site, then the archaeological contractor must submit a written scheme of investigation for approval by the AO before extending the size of the trenches.

APPENDICES

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

APPENDIX ONE

HEALTH AND SAFETY AND INSURANCE

A health and safety statement and risk assessment, identifying potential risks in a risk log (see template in appendix 2 of The MoRPHE Project Manager's Guide) and specifying suitable countermeasures and contingencies, is required to be submitted to the commissioning client.

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

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

The Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide 2016 contains general guidance on Risk management (Appendix 2).

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

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

Other potentially applicable legislation:

Working at Heights Regulations 2005, Manual Handling 1992

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

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

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

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

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

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

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

See also the joint English Heritage and Environment Agency document “Guidance on Assessing the Risk Posed by Land Contamination and its Remediation on Archaeological Resource Management” (English Heritage and Environment Agency 2005).

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

The Archaeological Contractor must detail measures taken to ensure the safe conduct of excavations, and must consult with the client's structural engineers concerning working in close proximity to the foundations of the surrounding buildings.

Excavation trenches should:

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

The archaeologists must not work near overhead power lines.

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

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

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

APPENDIX THREE

ENVIRONMENTAL SAMPLING AND SCIENTIFIC ANALYSIS

This is a compulsory part of the archaeological work.

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

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

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

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

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

The choice of material for assessment should be demonstrated as adequate to address the objectives. Evaluations and assessment of environmental material should provide clear statements of their potential and significance in addition to descriptive records. These statements should relate to the original objectives but may also lead to new or modified objectives.

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

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

Types of sample

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

Therefore consideration should be given to issues such as:

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

Bulk samples for flotation

These are used to recover charred and mineral-replaced plant remains, small bones, industrial residues etc. Such samples should be whole earth, 40-60 litres or 100% of small features. The geological sieve used to capture the flot/washover should be 0.25-0.3mm. The residue sieve size should be 0.5-1mm.

Waterlogged Samples:

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

Coarse-sieved samples:

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

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

Aims and objectives

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

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

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

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

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

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

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

APPENDIX FOUR

SCIENTIFIC DATING

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

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

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

APPENDIX FIVE

SPECIFIC TYPES OF SAMPLES

Pollen

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

Forams and diatoms

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

Insects

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

Industrial Activity

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

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

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

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

Buried soils and sediments

Buried soils and sediment sequences should be inspected and recorded on site by a recognised geoarchaeologist. Procedures and techniques in the Historic England guidelines "Environmental Archaeology" (English Heritage 2011) and "Geoarchaeology", (Historic England 2015d) should be followed.

Wood

Sampling strategies for wooden structures should follow the methodologies presented in "Waterlogged wood: Guidelines on the recording, sampling, conservation and curation of waterlogged wood" (English Heritage 2010). Considerations should also be given to the Historic England Document "Waterlogged Organic Artefacts", (English Heritage 2012). If timbers are likely to be present on your site, contact a wood specialist beforehand. Pre-excavation planning will determine questions to ask, agree on a sampling strategy, allocate reasonable time and budget.

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

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

Suitable samples should be submitted for dendrochronological dating. See English Heritage guidelines, “Dendrochronology” (English Heritage 2004).

Leather and organic materials

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

Glass

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

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

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

APPENDIX SIX

ANIMAL BONE

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

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

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

Fish and Bird bone

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

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

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

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

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

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

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

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

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

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

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

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

Acidic soils mean poor preservation of bone.

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

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

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

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

APPENDIX SEVEN

HUMAN REMAINS

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

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

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

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

Excavators must comply with the relevant legislation (essentially the Burial Act 1857) and local environmental health concerns. If found, human remains must be left in-situ, covered and protected. The archaeological contractor will be responsible for informing the police, coroner, local Environmental Health department and the County Archaeologist. If it is agreed that removal of the remains is essential, the archaeological contractor will apply for a licence from the 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 have been dropped or lost; Votive or ritual deposits.
- Any object, whatever it is made of, that is found in the same place as, or had previously been together with, another object that is Treasure.
- single precious metal coins that have been modified into objects – that is, altered in some way as to make it likely that they were taken out of circulation - can, if older than 300 years old, qualify as Treasure. This is usually seen in the form of a conversion of the coin into a brooch or pendant, or some other form of jewellery or dress accessory, evidence of which can include the addition of a suspension loop to the top, a pin (or the remains of one) at the back, or gilding. Additionally, piercings can be present.

Any object that would previously have been treasure trove, but does not fall within the specific categories given above. Only objects that are less than 300 years old, that are made substantially of gold or silver, that have been deliberately hidden with the intention of recovery and whose owners or heirs are unknown will come into this category.

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

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

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

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