ARCHAEOLOGICAL SERVICES WYAS

# Ripon House
# Ripon
# North Yorkshire

*Archaeological Investigations*

*Interim Report*

*October 2009*

*Report No. 1989*

CLIENT

Home Group Limited

# Ripon House
# Ripon
# North Yorkshire

## Archaeological Investigations

## Interim Report

*Summary*

*Between February and May 2009, Archaeology Services WYAS carried out both geophysical (magnetometer and earth resistance) and archaeological evaluations followed by a targeted open area excavation within the grounds of Ripon House, Ripon, a former North Yorkshire County Council nursing home. The work was commissioned by Home Group Limited prior to development of the site. The geophysical survey yielded few areas of possible archaeological interest; however it is probable that current land-use affected the results obtained. The evaluation revealed evidence of medieval activity, a late medieval lime kiln, evidence of post medieval quarrying and a brick-built Victorian water cistern serviced by three culverts.*

*A small open-area excavation was centred on the lime kiln. The kiln consisted of a 2.2m deep tapered fire pit measuring 5.7m in diameter at the top and 4m at the base. It had two opposing projecting flues, roofed with stone lintels, through which air entering the kiln could be regulated. The pit had a stone flagged base and was lined with a revetment wall constructed of re-used dressed limestone blocks and cobbles. Pottery recovered from the backfill of the kiln dates its abandonment to the mid 16th-century.*

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## Report Information

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| Client: | Home Group Limited |
| Address: | Home Central, Knight House, 2 Sandbeck Court, Wetherby West Yorkshire, LS22 7BA |
| Report Type: | Archaeological Evaluation and Excavation |
| Location: | Ripon House, Ripon |
| County: | North Yorkshire |
| Grid Reference: | SE 3162 7131 |
| Period(s) of activity represented: | Medieval, Victorian |
| Report Number: | |
| Project Numbers: | 3283, 3399, 3406, 3427, 3439 |
| Site Code: | RHR.09 |
| Planning Application No.: | |
| Museum Accession No.: | |
| Date of fieldwork: | January 19th, February 12th - 26th, March 9th - April 2nd, April 28th – May 7th |
| Date of report: | |
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Authorisation for distribution: ----------

ISOQAR ISO 9001:2000
Certificate No. 125/93

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## Acknowledgements

Archaeological Services WYAS would like to thank Home Group Ltd for commissioning the works and Gerald Hemmingway for his management of the project to date on behalf of Home Group. The fieldwork was carried out by Phil Weston, Christina Elcock and Thomas Weavill.

# 1 Introduction

Archaeological Services WYAS (hereafter ASWYAS) was commissioned by Home Group Limited to undertake, in the first instance, a metal detector survey, geophysical survey of both magnetometry and earth resistance followed by an archaeological evaluation on land at Ripon House, Ripon, North Yorkshire. These works followed from a desk-based assessment of the site (Pollington 2008) also commissioned by Home Group Limited. The evaluation, by trial-trenching, was carried out in accordance with a Written Scheme of Investigation produced by ASWYAS (Weston 2009). The trenching identified significant archaeological remains (Trench 6) resulting in a 230m² open area excavation to further investigate and clarify their nature and significance prior to the demolition of the nursing home.

### Site location and topography

Ripon is situated on the north-western edge of the Vale of York, approximately 35km to the north-west of York, and 16km to the south-west of Thirsk. The town lies on a spur of land on the western side of the River Ure, which marks the divide between the low lying ground of the Vale of York to the east and the edge of the Pennine uplands to the west. Today, the town is centred around the Market Place, with Ripon Cathedral situated on a ridge of higher ground to the south-east which slopes down to the River Skell to the south.

The proposed development site is situated within an approximately triangular area of land, about 150m to the north-east of Ripon Cathedral, centred at SE 3162 7131. It covers an area of 0.57 hectares, and lies at a height of about 27m above OD (Fig. 1).

The site is situated within a largely residential area, and is bounded to the north and east by Priest Lane, to the south by Residence Lane and to the west by buildings fronting onto St Marygate. The site is currently occupied by Ripon House, a North Yorkshire County Council owned former nursing home which was constructed in the 1970s, with surrounding areas of lawn and gardens, and a tarmac surfaced car park on its south-western side. The site is surrounded by a stone wall, about 1.5m high.

### Soils, geology and land-use

Ripon lies on the eastern side of the band of Magnesian Limestone and Permian Mudstones which runs between the Sandstones of the Vale of York and the Millstone Grit of the eastern Pennines (BGS 2001). Within the site bounds this is overlain by slightly acid loams and clay soils with impeded drainage (National Soil Resources Institute).

# 2 Archaeological and Historical Background

### Prehistoric

The desk based assessment (Pollington 2008) did not identify any prehistoric finds or sites within its study area but, evidence from further afield suggests that modern day Ripon is

situated within a once vital prehistoric landscape. Neolithic activity is attested to by the presence of ritual and funerary monuments, such as the three Thornborough Henges 7km to the north of Ripon which overly an earlier cursus monument. Three further henges lie about 3km to the west of the town at Hutton Moor, Cana Barn and Nunwick and the massive standing stones known as the Devil's Arrows are situated 7km to the south-east, outside Boroughbridge.

Early Bronze Age monuments have been identified between the River Ure and the River Swale, such as the barrows at Hutton Grange, 4km to the north-east of Ripon.

Extensive areas of Iron Age settlement, including enclosures, farmsteads, trackways and fields systems have been identified across the western edge of the Vale of York (Vyner 2003, 45), although no evidence for Iron Age occupation has been identified within Ripon.

**Roman**

There is little evidence for any form of Roman activity within the town, apart from a few residual pieces of Roman pottery found in Anglo-Saxon and medieval contexts during archaeological excavations in Deanery Gardens and at Ripon Cathedral Primary School (Whyman 1997; McComish 2001b).

**Anglo-Saxon**

The name 'Ripon' derives from the Old English *Hrypum*, meaning 'amongst the *Hrype*', the *Hrype* being a local Anglo-Saxon tribal group (Smith 1961, 165), although by the early 7th century the area was part of the kingdom of Northumbria. The earliest settlement at Ripon probably originated about AD 657, when land was granted by King Alhfrith of Deira to a group of monks of the Celtic Church to create a daughter house of their monastery at Melrose (Ryder 1990, 1). Following the Synod of Whitby in AD664, and the adoption of the Roman liturgy in Northumbria, it appears that the Celtic monks abandoned the site, and it was instead granted to Wilfrid, the Bishop of York, who constructed new monastic buildings here about AD 671-678 (Sherley-Price 1990, 187; Hall and Whyman 1996, 65). The new monastery included 40 hides of land, with a church built of dressed stone, including columns and side aisles (Hall and Whyman 1996, 63). The surviving crypt, beneath the present Ripon Cathedral, is thought to have been part of Wilfrid's original church, which was destroyed in AD 948 (Taylor and Taylor 1965, 301).

It has been suggested that the area of the proposed development site formed part of the earliest monastic foundation in Ripon (Mackay 1982, 76). During the mid-19th century the local historian J.R. Walbran recorded the discovery of Northumbrian s*tyca* coins from the site, a coin type which dates to the first half of the 9th century (Booth 2000, 89), together with the foundations of a stone building and a grit-stone column (Walbran 1875, 23-24). Cartographic evidence also implies that the site may have had some early monastic function. A map in a mid-18th century antiquarian history of Ripon provides the earliest source,

marking the site as being 'Where the Scots monastery was, now a hill…where foundation stones have been found' (Gent 1733). On Jefferys' 1772 'Plan of Ripon' the site is marked with 'Here the Scotch Monastery Stood', and in the early 19th century Langdale named it as the 'Site of the Scots Monastery' (Jefferys 1775; Langdale 1818).

In continental Europe a 'Scotch Monastery', or *Schottenklöster,* is a term applied to monastic foundations by early medieval Irish or Scottish missionaries (Ott 1912, 589-590), and this name is perhaps suggestive of a link between the site and the original mid-7th century Celtic monastery at Ripon. It has also been suggested, through analysis of the street pattern in the area around the proposed development site, that this area formed part of the pre-conquest monastic holdings in Ripon, with the curving alignment of Priest Lane to the north and east of the site preserving the line of part of the boundary of this area (Mackay 1982, 76; Hall and Whyman 1996, 143).

Archaeological excavations undertaken to the immediate south of the proposed development site during the construction of the new Ripon Cathedral Primary School in 2000 uncovered a number of Anglo-Scandinavian finds (McComish 2001b), and an Anglo-Saxon coin is also recorded as having been found in the area during the 19th century (Walbran 1875).

To the south of the school site is Ailcy Hill (named as 'Ailey Hill' on modern ordnance survey mapping), a large tree covered mound about 11m high. Anglo-Saxon coins were found on the site in the late 17th century, and subsequent antiquarians recorded the discovery of human bones in the mound, and identified it individually as a Saxon or 'Danish' burial mound, 'a great fortress of the Britons time', or as the motte of a Norman Castle (Hall and Whyman 1996, 67).

Archaeological excavation has shown it to be a natural morainic mound of sand and gravel, into which numerous burials have been inserted dating from the 7th century to the 9th century, some of which may pre-date the establishment of the monastery at Ripon (Hall and Whyman 1996). Anglo-Saxon period burials were also discovered during excavation at the site of the medieval Ladykirk chapel, on the western side of St Marygate, to the south-west of the proposed development site. These were found to contain bone combs of an Anglo-Scandinavian style dating to between the 9th and mid-11th centuries (Macgregor 1996, 127). There was a chapel on this site by at least the early 11th century, and fragments of 8th and 9th century stone work may indicate that there was also an earlier chapel on the site (Hall and Whyman 1996, 130). In 1977, excavations carried out about 60m to the south of the Ladykirk site only identified a small area of possible pre-conquest deposits, but did discover a gold, garnet and amber roundel, known as 'The Ripon Jewel' which probably dates to the early or mid-7th century (Hall *et al.* 1996, 134-6).

**Medieval**

There was substantial expansion and development in Ripon from the first half of the 12th century onwards. This included the re-building of Ripon Cathedral in the mid-12th century,

as well as the construction of new hospitals and chapels, such as St Mary Magdalene, St Anne's Chapel and hospital, the Bedern Chapel, which was founded in the early 14th century, and a possible church on All Hallows Hill. There was also a phase of urban re-planning during the 12th century, which saw the laying out of St Marygate, and the present Market Place, which both follow the same north-south alignment (MacKay 1982, 78; Hall and Whyman 1996, 140).

Archaeological excavations in the area around Market Place have revealed evidence of medieval burgage plots and associated features, as well as evidence of butchery, pottery production and brewing (Anon. 2005; Finlayson 2004) in well preserved stratified deposits dating from the 11th to the 15th century (Finlayson 2001). To the south of Market Place, excavations on Water Skellgate have also revealed deeply stratified medieval deposits and features, including cobble-built walls and floor surfaces, post-holes and evidence of smithing and food preparation (Rose 2004).

Immediately to the north of Ripon Cathedral, a number of early medieval burials have been identified during archaeological watching briefs undertaken along Minster Road (Antoni 1999; McNab 2002). This may be the southward continuation of a cemetery discovered in the area of the Ladykirk, Deanery Gardens, and on St Marygate, to the south-west of the proposed development site (Johnson 2001b; Hall and Whyman 1996). The remains of a 12th century building has also been recorded on the eastern side of St Marygate.

Evidence of medieval activity on the site of the Ripon Cathedral Primary School to the south of the proposed development site included features dating from the 11th to the 14th century. However, these were largely in the form of field boundaries (Johnson 2000b; McComish 2001b), and it is likely that this area remained open ground on the edge of the town centre throughout the medieval period. To the immediate north-west of the proposed development site, archaeological excavation has revealed a number of 12th to the 14th century medieval pits (Rutledge 2000).

**Post-medieval and modern**

During the post-medieval period, it is likely that the proposed development site remained open ground. Jefferys' map of 1775 depicts a large mound covering much of the western part of the site, which may have been a small glacial hill of sand and gravel, similar to Ailcy Hill to the south (Jefferys 1775). This mound is not depicted on subsequent maps such as Thomas Langdale's map of 1818, which does show other prominent topographical features (Langdale 1818). The First Edition Ordnance Survey map of 1856 shows a gravel pit on the northern side of the study area, and a slight slope to the south-west of where the mound was shown on Jefferys' map, and it seems likely that this mound was quarried away during the first half of the 19th century.

By 1800, a building had been constructed on the north-eastern side of the proposed development site, fronting onto Priest Lane, but this was demolished by the early 20th

century (Humphries 1800; Ordnance Survey 1929). By the 1890s, a school had been built in the north-western corner of site, which was itself demolished by the middle of the 1960s (Ordnance Survey 1892). After the Second World War, the western end of Priest Lane, on the northern side of the proposed development site, was widened through the demolition of a hall and a row of houses.

The majority of the extant buildings adjacent to the proposed development site, and in the immediate vicinity, are no earlier than the 18th or early 19th century. The House of Correction, which abuts the south-western corner of the proposed development site, originally dates to about 1685, but underwent substantial alteration and addition in the early 19th century (Briden 2004).

## 3 Aims and Objectives

The aim of the metal detector survey was to identify and locate any remains of metal objects in the first 20cm of topsoil.

The general aims of the geophysical survey were:

- To determine (so far as is possible) the presence or absence of buried archaeological remains in the survey area
- To clarify the extent and layout of previously unknown buried remains within the survey area
- To interpret any geophysical anomalies identified by the survey.

These aims were to be achieved by undertaking detailed (recorded) magnetometer and earth resistance survey

The primary aims of the archaeological evaluation were:

- To establish the existence, extent, date and significance of any archaeological remains within the site bounds
- To assess the impact the proposed development would have on any such remains
- To inform and guide any mitigatory measures proposed

Following the identification of significant archaeological remains in Evaluation Trench 6, an open area excavation was initiated. The primary aims of the excavation were:

- To identify the extent, date and character of the archaeological remains
- To identify the extent and character of any related archaeological remains
- To assess the impact the proposed development will have on the remains

- To inform and guide any mitigatory measures necessary

# 4 Methodology

### Metal detector survey

A Minelab X-Terra 50 metal detector was used during the survey on traverses 50cm apart over all parts amenable to the technique. Find locations were allocated a unique, alpha-numeric code, marked with a flag and later tied in with the Trimble Geodimeter 5600 series theodolite. All recovered artefacts will therefore be recorded to Ordnance Survey NGR coordinates.

This methodology complies with guidelines outlined by English Heritage (David *et al.* 2008)

### Geophysical survey

Bartington Grad601 magnetic gradiometers were used during the magnetometer survey taking readings at 0.25m intervals on zig-zag traverses 1m apart within 20m by 20m grids so that 1600 readings were recorded in each grid. These readings were stored in the memory of the instrument and later downloaded to computer for processing and interpretation. Geoplot 3 (Geoscan Research) software was used to process and present the data. Further details are given in Appendix 1.

A Geoscan RM15 resistance meter with a multiplexing unit MPX15 was used during the earth resistance survey, with the instrument logging each reading automatically at 1m intervals on traverses 1m apart within 20m by 20m grids. The mobile probe spacing was 0.5m with the remote probes 15m apart and at least 15m away from the grid under survey. This mobile probe spacing of 0.5m gives an approximate depth penetration of 1m for most archaeological features.

The geophysical survey methodology and report comply with guidelines outlined by English Heritage (David *et al.* 2008) and by the Institute for Archaeologists (IfA) (Gaffney *et al.* 2002).

Technical information on the equipment used, data processing and earth resistance survey methodology is given in Appendix 1. Appendix 2 details the survey location information and Appendix 3 describes the composition and location of the survey archive.

### Archaeological evaluation and excavation

The archaeological evaluation and open area excavation were carried out in accordance with recognised professional standards, specifically *Standards and Guidance for Archaeological Field Evaluation* (Institute for Archaeologists 2008), *Standards and Guidance for Archaeological Excavation* (Institute for Archaeologists 2008) and *Management of*

*Archaeological Projects* (English Heritage 1991). ASWYAS's own methodologies (ASWYAS 2009) were also adhered to.

The archaeological potential of the site was to be assessed by the excavation by machine of ten evaluation trenches measuring 2m by 10m. The locations of the trenches were guided by the results of the geophysical survey when appropriate, with the remainder providing an untargeted sample of the site. Two temporary benchmarks were set up on site in order to establish the level of the site above ordnance datum and the level AOD of any archaeological remains. The levels for the temporary benchmarks were transferred on to site from a benchmark located on a private dwelling fronting on to St Marygate, which bounds the site to the west.

The evaluation trenches and the subsequent open area excavation (expanding Trench 6) were excavated by a 360° mechanical excavator fitted with a 2.00m toothless ditching bucket under the direct supervision of a qualified archaeologist (Fig. 8). Overburden was removed in successive spits until the archaeological horizon or natural deposits were encountered. Thereafter, all investigations were undertaken by hand. Artefactual evidence was collected whenever encountered and environmental samples were taken from significant and primary archaeological deposits. All archaeological features and deposits were photographed and drawn to scale as appropriate and recorded using a standardised *pro-forma* system. Feature sections were drawn at a scale of 1:10 and trench plans and sections were drawn at 1:50. The open area excavation was planned at a scale of 1:25.

# 5 Results

### Metal detector survey

Very few artefacts were located during the survey. Two modern pieces of cutlery were located but were not recorded. No other artefacts were identified during the survey.

### Magnetometer survey (Figs 2 – 4)

The majority of the survey area possessed highly magnetic responses. These anomalies are typically caused by ferrous (magnetic) material, either on the ground surface or in the topsoil, which cause rapid variations in the magnetic readings giving a characteristic 'spiky' XY trace. The close proximity of the existing building will have contributed to the disturbance of the magnetic survey. Little importance is normally attached to such anomalies, unless there is supporting evidence for an archaeological interpretation particularly close to residential housing. Isolated 'spike' anomalies are located in the eastern section of the site and are not considered to be archaeologically significant.

### Earth resistance survey (Figs 5 – 7)

Several areas of high resistance have been identified across the site but show no strong correlation to the results of the magnetic survey.

Areas of very high resistance due to modern disturbance were recognised at the periphery of the driveway, car park and the house. Other areas of high resistance have been recorded to the east of the house.

Areas of low resistance have been recorded in the survey, which is probably due to pockets of slightly more water retentive soil.

Linear anomalies of both low and high resistance have been identified to the east of Ripon House but these are interpreted here as either modern or geological in origin.

**Archaeological Evaluation**

*Trench 1*

Trench 1 was located close to the western boundary of the site (Fig. 8). Deep deposits of made ground were encountered, which made it necessary to step the trench to comply with health and safety guidelines (Fig. 15, S.1).

Table 1. Sample section of Trench 1.

| **Sample section:** North end, West facing (0.00 = 27.19m AOD) | | |
|---|---|---|
| **Orientation:** N/S | | **Dimensions:** 2.8m x 14.5m (top) 1.8m x 12.7m (base) |
| **Context** | **Depth** | **Description** |
| 100 | 0.00 – 0.30m | Topsoil. Dark greyish-brown, silty sand |
| 132 | 0.30 – 0.50m | Made ground. Dark red-brown, crushed stone rubble and gravel |
| 131 | 0.50 – 0.90m | Made ground. Mid red-brown, clayey earth with cobbles and gravel |
| 134 | 0.90 – 1.05m | Buried soil horizon. Dark grey/black, clayey silt |
| 161 | 1.05 – 1.50m | Buried subsoil horizon. Mid to dark grey-brown, clayey silt |
| 106 | 1.50m+ | Natural. Cobbles and gravel in dark pink-red sand matrix |

The excavation of Trench 1 revealed a cobble-built wall and a brick-built water cistern fed by three culverts. The cobble wall (136) was located at the southern end of the trench crossing it on an east/west alignment. Two skins of cobbles, 0.42m thick in total, were bonded with lime mortar and survived to a height of 0.55m. The wall was constructed over the top of one of the culverts that fed into the water cistern (Plate 1).

The water cistern (139) consisted of a brick-built dome some 3m in diameter and at least 2.6m deep (Plate 2). A 0.9m diameter opening was located at the top of the dome. The cistern appeared to have been backfilled around a 0.22m diameter central post or pipe, since removed, leaving a void. It is possible a hand pump once sat atop the cistern. The structure sat within the construction cut 138, which was backfilled with deposit 137. Four sherds of cream ware pottery were recovered from 137 suggesting a 19$^{th}$-century date for the construction of the cistern.

The cistern was supplied by at least three culverts (140, 141 and 142). The culverts were of similar construction, consisting of limestone capping slabs, four courses of bricks forming the

sides and limestone base slabs sat on red brick plinths (Fig. 9). Two capping slabs of Culvert 142 were lifted revealing two slightly clayey, silty fills (149 and 150). The basal fill (149) contained a sherd of cream ware pottery indicating a 19th century date for the culvert.

Removal of the fills revealed that where the culvert adjoined the cistern, the culvert was bricked-up, leaving a small gap at the top (Plate 3). This may reflect a change in function or abandonment of the cistern but it is thought more likely that the bricks acted as a silt trap keeping the water that entered the cistern as clean as possible.

*Trench 2*

Trench 2 was located close to the western boundary on the site, 7m to the south of Trench 1 (Fig. 8). It was necessary to step the trench due to the deep deposits of made ground that were encountered (Fig. 15, S.2).

Table 2. Sample section of Trench 2.

| **Sample section:** Mid point of trench, east facing (0.00 = 27.22m AOD) | | |
|---|---|---|
| **Orientation:** N/S | | **Dimensions:** 14.6m x 3.5m (top) 11.2m x 2.0m (base) |
| **Context** | **Depth** | **Description** |
| 100 | 0.00 – 0.20m | Dark greyish-brown, silty sand topsoil |
| 107 | 0.20 – 0.35m | Made ground. Mid grey-brown, clayey silt with cobbles |
| 108 | 0.35 – 0.60m | Made ground. Mid pink, silty sand with gravel |
| 109 | 0.60 – 1.07m | Made ground. Light grey-brown, silty clay with cobbles and building rubble |
| 110 | 1.07 – 1.28m | Made ground. Dark brown-black, clayey silt with gravel |
| 111 | 1.28 – 2.24m | Buried soil horizon. Mid grey-brown, clayey silt with cobbles and gravel |
| 106 | 2.24m+ | Natural. Cobbles and gravel in dark pink-red sand matrix |

The excavation of Trench 2 revealed a cobble and brick structure, a pit, a post-hole and a cobble kerb edge associated with a lime mortar surface and a possible cobble surface. The structure (175) consisted of two walls (143 and 144) forming a right angle (Fig. 10). Wall 143 was constructed of a single course of red bricks set on their edges and bonded with lime mortar (Plate 4). Wall 144 consisted of two skins of stone cobbles also bonded with lime mortar. The cobbles were 0.6m wide, survived to a depth of 0.5m and the whole structure measured 2.2m+ north/south and 1.9m+ east/west.

The structure sat within construction cut 176 and the walls were laid on the foundation deposit 146, which consisted of stones in a compacted, clayey sand matrix. Construction cut 176 was cut into the buried soil horizon 111 and Structure 175 was overlaid by made ground deposit 110. The backfill of Structure 175 (145) contained glass, bone, clay pipe, shell and pottery which suggested a 19th to 20th-century date for its demolition.

The remaining archaeological deposits were all sealed beneath the buried soil horizon 111. The kerb edge and associated surfaces were located at the southern end of the trench (Fig. 10). The kerb edge (112) consisted of five cobbles, three of which appeared to have been

dressed with the flat surfaces presented upwards (Plate 5). The cobbles were on an east/west alignment with the mortar surface (113) to the north and the possible cobble surface (147) to the south. Possible surface 147 consisted of loosely aggregated cobbles pushed into the surface of the natural (106). They have been interpreted as the remains of a surface rather than naturally occurring stone as they appear to the south of the kerb edge and nowhere else in the trench.

Surface 113 butted up against the southern edge of the kerb stones (Plate 5), and consisted of a light, greyish yellow mortar generally 0.05m thick. Excavation of 113 revealed that it had been laid over a mesh of brushwood, perhaps wattle, which had left their impressions in the underside of the deposit (Plate 6).

Pit 122 was located 1.8m to the south of structure 175 (Fig. 10). It was only partially exposed in the trench and measured 1.15m by 0.90m+ by 0.45m deep. It contained two fills (121 and 120) the upper of which, 120, produced 126 fragments of animal bone, two iron objects and fragments of fired clay/daub. The lower fill (121) contained animal bone, slag, clinker and fired clay/daub, all retrieved from Environmental Sample 1.

Post-hole 162 was located between structure 175 and pit 122. It too was only partially revealed in the trench and it measured 0.38m by 0.26m+ by 0.2m deep. Its fill (163) contained packing stones and a single piece of animal bone.

*Trench 3*

Trench 3 was located 8m to the east of Trench 2. It was moved southwards of its original position in order to test whether the stone kerb and associated surfaces identified in Trench 2 continued eastwards (Fig. 8).

Table 3. Sample section of Trench 3.

| **Sample section:** North-north-east end, west-north-west facing (0.00 = 27.35m AOD) | | |
|---|---|---|
| **Orientation:** NNE/SSW | | **Dimensions:** 14.2m x 3.1m |
| **Context** | **Depth** | **Description** |
| 100 | 0.00 – 0.23m | Dark greyish-brown, silty sand topsoil |
| 123 | 0.23 – 0.50m | Made ground. Dark grey-brown, silty sand with cobbles |
| 124 | 0.50 – 0.75m | Made ground. Light yellow-brown, clayey silt with gravel |
| 125 | 0.75 – 0.92m | Made ground. Mid orange-red, sand with occasional gravel |
| 126 | 0.92 – 1.10m | Made ground. Blackish-brown, clayey silt |
| 127 | 1.10 – 1.28m | Made ground. Mid orange-brown, silty sand with cobbles and building rubble |
| 128 | 1.28 – 1.50m | Buried soil horizon. Dark blackish-brown clayey silt |
| 129 | 1.50 – 2.50m | Buried subsoil horizon. Med red-brown, clayey silt with cobbles and gravel |
| 106 | 2.50m+ | Natural |

Unfortunately, Trench 3 could not be excavated down to the underlying natural as three modern drains were encountered. It was, however, possible to dig a 1.8m by 3.5m sondage at

the northern end of the trench and deep deposits of made ground were again encountered (Table 3). No archaeological features were identified in the sondage.

*Trench 4*

Trench 4 was located on the front lawn of Ripon House, 11m to the east of Trench 3 (Fig. 8).

Table 4. Sample section of Trench 4.

| **Sample section:** South-west end, north-west facing (0.00 = 27.22m AOD) | | |
|---|---|---|
| **Orientation:** NE/SW | | **Dimensions:** 10.1m x 3.6m (top), 10.1m x 2.25m (base) |
| **Context** | **Depth** | **Description** |
| 100 | 0.00 – 0.30m | Dark greyish-brown, silty sand topsoil |
| 101 | 0.30 – 0.90m | Made ground. Pinkish red, crushed building rubble |
| 102 | 0.90 – 1.50m | Made ground. Orange-red, clayey sand with cobbles |
| 103 | 1.50 – 2.00m | Made ground. Dark grey-brown, sandy clay with cobbles |
| 104 | 2.00 – 2.30m | Buried soil horizon. Black, sandy clay with occasional small stones |
| 105 | 2.30 – 2.80m | Fill of quarry pit 166. Brown-grey, clayey sand |
| 106 | 2.80m+ | Natural |

The excavation of Trench 4 revealed a possible wall footing (151), a large pit (170) and a quarry pit (166) (Fig. 11). The possible wall footing (151) was on a north-west/south-east alignment, had dimensions of 1.m+ by 0.63m by 0.35m deep and consisted of lime mortar and occasional cobbles. It sat within the construction cut 171. The fill of cut 171 (164) contained a mixed assemblage of pottery dated from the later medieval through to the 19th century.

Construction cut 171 was cut into the top fill (165) of pit 170. The extent of pit 170 lay beyond the trench limits but measured at least 1.65m by 1.30m by 1.45m deep. Pit 170 contained a series of fills which produced animal bone, slag, two iron objects, CBM, and a mixed assemblage of pottery dating from the medieval period to the 19th century. Pit 170 was cut in to the fill of quarry pit 166.

The full extent of quarry pit 166 presumably lay well beyond the limits of Trench 4 as only the north-eastern quarter of Trench 4 revealed natural deposits. A sondage was excavated through the quarry fill (105) at the south-western end of Trench 4, which revealed natural gravels at a depth of 2.80m below ground surface. Quarry fill 105 produced a large assemblage of animal bone with elements from meat producing domesticates suggesting the open pit was used for rubbish disposal.

*Trench 5*

Trench 5 was located to the south of Trenches 3 and 4 (Fig. 2).

Table 5. Sample section of Trench 5.

| **Sample section:** East end, north facing (0.00 = 27.18m AOD) | | |
|---|---|---|
| **Orientation:** E/W | | **Dimensions:** 9.2m by 3.4m (top), 8.0m by 2.0m (base) |
| **Context** | **Depth** | **Description** |
| 100 | 0.00 – 0.40m | Dark greyish-brown, silty sand topsoil |
| 177 | 0.40 – 0.90m | Made ground. Pinkish red, crushed building rubble |
| 178 | 0.90 – 1.25m | Made ground. Orange-red, clayey sand with cobbles |
| 179 | 1.25 – 1.75m | Buried soil horizon. Black, sandy clay with occasional small stones |
| 180 | 1.75 – 2.75m | Probable fill of quarry pit. Brown-grey, clayey sand |
| 106 | 2.75m+ | Natural |

The excavation of Trench 5 revealed a series of made ground deposits overlying a buried soil horizon (179) which in turn overlaid the backfill of a probable quarry pit (180). Given Trench 5's proximity to Trench 4, it is probable deposit 180 is the same as quarry pit fill 105, indicating that much of the southern side of the site has been quarried away.

*Trench 6*

Trench 6 was located to the east of Ripon House, adjacent to the southern boundary of the site and perpendicular to Residence Lane (Fig. 8).

Table 6. Sample section of Trench 6.

| **Sample section:** North-north-east end, west-north-west facing (0.00 = 27.14m AOD) | | |
|---|---|---|
| **Orientation:** NNE/SSW | | **Dimensions:** 9.4m x 2.0m |
| **Context** | **Depth** | **Description** |
| 100 | 0.00 – 0.40m | Dark greyish-brown, silty sand topsoil |
| 114 | 0.40 – 0.65m | Mid reddish-brown, clayey silt subsoil |
| 106 | 0.65m+ | Natural |

The excavation of Trench 6 revealed some upstanding masonry consisting of two walls (115 and 154) at right angles to each other, a possible associated crushed limestone surface (116) (Fig. 12; Plate 7), a post-hole (118) and a gully (173).

As hand excavation progressed, it became apparent that possible surface 116 was in fact the upper fill of a large construction cut (158) (Fig. 15, S.3 & S.4). The homogenous nature of 116 indicates it was laid down quickly, suggesting it was an intentionally placed, ground levelling deposit. Beneath 116 was a second layer of made ground consisting of crushed limestone in a silty matrix (157) and beneath this was a layer of dark reddish-brown, sandy silt (130) (Fig. 13a). The texture of 130 suggests it took some time to form, probably under

intermittently wet conditions. Finds recovered from deposit 130 consisted of seven sherds of medieval pottery, animal bone and an iron object.

The removal of the upper three fills of construction cut 158 revealed more of the walls and a deposit of dumped cobbles and limestone blocks (160) (Fig. 13b; Plate 8). This deposit appeared to be a demolition layer and therefore, likely to be contemporary with the abandonment of the structure represented by the walls. Some of the flatter stones within the deposit appeared to have specially selected and placed on edge up against a limestone slab lintel built into Wall 115 (Plate 9). Further investigation revealed a void behind these stones.

The complete removal of 160 revealed that the lintel was capped by a row of cobbles then three further courses of limestone blocks (115) and supported by two walls constructed of cobbles and limestone blocks (152 to the left and 153 to the right) (Fig. 13c; Plate 10). The walls were sat within a revetted cut creating an aperture 0.78m wide at the top, beneath the lintel, 0.56m wide at the base and 0.88m in height (Fig. 16, S.5). The whole structure was awarded the structure number 1001.

The view into the void was of a series of five stepped lintels descending into the earth with the front face of the fifth lintel being approximately 2m distant from the face of the first (Plate 11). The underside of the fifth lintel was approximately 1m lower that the underside of the first. These dimensions indicated that the passageway led out beyond the extent of Trench 6 and so it was decided that the archaeological remains were to be the subject of further investigation at a later date. The findings of this excavation are detailed in the following section of this report.

Gully 173 (2.0m+ by 0.65m by 0.27m) crossed the trench on an east/west alignment immediately to the north of structure 1001. Pit/posthole 118 shared an indeterminate relationship with the southern edge of Gully 173 suggesting the features were contemporaries. As it was impossible to distinguish between the two fills, the excavator recorded a single fill for both features (119). Fill deposit 119 produced one sherd of medieval pottery, a piece of glass and 30 fragments of animal bone.

*Trench 7*

Trench 7 was located to the east of Ripon House, 2.5m to the north-east of Trench 6 (Fig. 8).

Table 7. Sample section of Trench 7.

| **Sample section:** East-south-east end, north-north-east facing (0.00 = 27.33m AOD) | | |
|---|---|---|
| **Orientation:** ESE/WNW | | **Dimensions:** 9.6m x 2.0m |
| **Context** | **Depth** | **Description** |
| 100 | 0.00 – 30m | Dark greyish-brown, silty sand topsoil |
| 114 | 0.30 – 0.60m | Mid reddish-brown, clayey silt subsoil |
| 106 | 0.60m+ | Natural |

The excavation of Trench 7 revealed clean, natural deposits at an average depth of 0.60m below the local ground surface. On inspection, no archaeological features or artefacts were identified.

*Trench 8*

Trench 8 was located to the east of Ripon House, 7m to the north-east of Trench 6 (Fig. 8).

Table 8. Sample section of Trench 8.

| **Sample section:** East-south-east end, north-north-east facing (0.00 = 27.40m AOD) | | |
|---|---|---|
| **Orientation:** ESE/WNW | | **Dimensions:** 10.0m x 2.0m |
| **Context** | **Depth** | **Description** |
| 100 | 0.00 – 0.33m | Dark greyish-brown, silty sand topsoil |
| 114 | 0.33 – 0.85m | Mid reddish-brown, clayey silt subsoil |
| 106 | 0.85m+ | Natural |

The excavation of Trench 8 revealed clean, natural deposits at an average depth of 0.80m below the local ground surface. On inspection, no archaeological features or artefacts were identified.

*Trench 9*

Trench 9 was located to the east of Ripon House, 5.5m to the north-north-east of Trench 8 (Fig. 8).

Table 9. Sample section of Trench 9.

| **Sample section:** East-south-east end, north-north-east facing (0.00 = 27.41m AOD) | | |
|---|---|---|
| **Orientation:** ESE/WNW | | **Dimensions:** 10.1m x 2.0m |
| **Context** | **Depth** | **Description** |
| 100 | 0.00 – 0.30m | Dark greyish-brown, silty sand topsoil |
| 114 | 0.30 – 0.70m | Mid reddish-brown, clayey silt subsoil |
| 106 | 0.70m+ | Natural |

The excavation of Trench 9 revealed clean, natural deposits at an average depth of 0.75m below the local ground surface. On inspection, no archaeological features or artefacts were identified.

*Trench 10*

Trench 10 was located to the east of Ripon House, 10m to the north-north-east of Trench 9 (Fig. 8).

Table 10. Sample section of Trench 10.

| **Sample section:** East end, north facing (0.00 = 27.51m AOD) | | |
|---|---|---|
| **Orientation:** E/W | | **Dimensions:** |
| **Context** | **Depth** | **Description** |
| 100 | | Dark greyish-brown, silty sand topsoil |
| 114 | | Mid reddish-brown, clayey silt subsoil |
| 106 | | Natural |

The excavation of Trench 10 revealed clean, natural deposits at an average depth of 0.70m below the local ground surface. On inspection, no archaeological features or artefacts were identified.

**Open area excavation (expansion of Trench 6)**

The open area excavation was centred on the archaeological remains revealed in Evaluation Trench 6 (Fig. 14). A total area of 230m² was mechanically stripped of topsoil and subsoil overburden, thereafter, all investigation was carried out by hand. The excavation revealed the sub-circular fire pit wall (1000) of a lime kiln varying in diameter between 5.4m and 5.7m. The wall was constructed of limestone masonry and natural cobbles with no apparent bonding. The excavation also revealed that the masonry first identified in Trench 6 (1001) was part of the same construction as 1000 and that a similar wall and lintel structure (1031) diametrically opposed to 1001, was also part of the complex. These constructions were the kiln flues. The projected dimensions of 1001 and 1031 suggested that openings into structure 1000 should be revealed as the fire pit backfill deposits were removed.

The upper backfill (1002) of the kiln fire pit consisted of masonry rubble and variously sized cobbles (0.20m to 0.70m in diameter) in a silty sand matrix. Initially, the backfill was excavated in plan, but it was noticed that the deposit appeared to be sorted, with finer, small grained material prevalent to the north-east and larger elements congregated to the south-west. This variation suggested that the backfill had been tipped into the structure from the north-east and that a tipping cone had formed as a result. It was decided, therefore, to half section the remaining backfill deposits on a north-east/south-west alignment.

The excavation of this section revealed a series of deposits consisting of, top to bottom, 1002, 1003, 1023 and 1024 (=1025, 1026 and 1027) (Fig. 16, S.6; Plate 12). Deposit 1003 consisted of a soft, sandy silt with occasional limestone fragments, tapering from a depth of 0.60m at the north-east to nothing 3m to the south-west. The underlying deposit (1023) consisted of a 0.60m deep layer of cobbles and limestone and sandstone rubble. The basal deposit (1024 =1025, 1026 and 1027) consisted of a 0.60m wide layer of lime mortar located in a ring up

against the base of the fire pit wall. Deposit 1024 was at its thickest (0.15m) adjacent to the wall and thinned out to nothing towards the centre of the fire pit. Beneath 1024 was the stone flag surface 1038 of fire pit 1000.

Following the recording of the section, the remaining backfill was excavated by hand, revealing the structure in full (Plates 13 and 14). The industrial complex consisted of a revetted fire pit lined by a cobble and masonry wall, two flues and a flagstone base. The fire pit had a diameter of between 5.4m and 5.7m at the surface, between 3.5m and 3.75m in the base and had a maximum depth of 2.2m. The flues were diametrically opposed, 1001 to the south-east and 1031 to the north-west. Each flue opened into the fire pit at the base of the lining wall forming apertures approximately 0.5 in width and 0.6m in height. The apertures were built of substantial pieces of masonry forming jambs either side capped by lintel slabs (Fig. 17, S.7 & S.8; Plates 15 and 16).

The fire pit revetment wall was constructed of un-bonded natural cobbles and limestone and sandstone masonry (Fig. 17, S.7). In places, patches of limestone mortar still adhered to the surface of the wall suggesting that, when in use, the fire pit wall had been rendered over (Plate 17). This theory is supported by the presence of deposit 1024 in the base of the fire pit, positioned as it was, most thickly up against the revetment wall. A mortar skimmed wall would have reflected heat back into the kiln and would also have protected the wall, particularly the limestone elements, from the heat.

The walls of the flues were similarly revetted and constructed of un-bonded cobbles and masonry but there was no evidence of a mortar render on their surfaces. The walls supported large, overlapped limestone slab lintels effectively forming stepped ceilings to the flues heading up to the surface. The bases of the flues consisted of stone flags.

The large finds assemblage retrieved from the excavated deposits within the fire pit and flues is tabulated below whilst the full finds assemblage is included in Appendix 6.

Table 11: Finds from the lime kiln backfills

| Context | Description | Finds (No.), [sample] |
|---|---|---|
| 116 | Backfill of flue 1001 (Eval) | Animal bone (7), CBM (2), iron object (1) |
| 117 | Backfill of flue 1001 (Eval) | Medieval pot (1) |
| 130 | Backfill of flue 1001 (Eval) | Medieval pot (7), animal bone (20), iron object (1) |
| 1002 | Upper fill of lime kiln fire pit 1000 | Medieval pot (11), iron objects (2), glass (1), masonry (4), human bone (2), animal bone (124) |
| 1003 | Third fill of lime kiln fire pit 1000 | Medieval pot (40), iron objects (210), lead objects (131), glass (26), CBM (31), masonry (2), human bone (57), animal bone (771), shell (23) |
| 1013 | Backfill of flue 1031 | Medieval pot (2), lead object (1), animal bone (6) |
| 1023 | Second fill of lime kiln fire pit 1000. Above 1024 | Medieval pot (19), iron objects (11), lead objects (6), glass (36), CBM (23), masonry (4), human bone (11), animal bone (343), shell (12), flint (1) |
| 1024 | Basal deposit in lime kiln fire pit | Medieval pot (1), animal bone (14), iron objects (12), |

| Context | Description | Finds (No.), [sample] |
|---|---|---|
| | 1000. Same as 1025, 1026 and 1027 | worked stone column (1), lead objects (2), daub? (13). Samples [5], [6], [8] and [9] |
| 1028 | Backfill of flue 1001 (Exc) | Iron object (8), glass (1), burnt bone (15), [10] |
| 1029 | Backfill of flue 1001 (Exc) | Animal bone (2) |

At this interim stage of reporting, specialist reports on the finds assemblage have not yet been commissioned, however, cursory examination of the pottery has identified Cistercian ware in the kiln backfill indicating it fell out of use in the latter half of the 16th century. The relevance of this date, the pottery and the rest of the assemblage will be considered in the 'Discussion' section of this report.

The construction cut for fire pit 1000 (1030) and the flues (1037 and 1045) were cut into the underlying natural deposits, however, 1030 and 1037 were abutted to the south-west by deposit 1014. Deposit 1014 was machine excavated in shallow spits down to natural along the southern boundary of the site in order to ascertain its depth (up to 0.82m). Thereafter, two hand dug test sections were excavated; Section 1 to date the deposit and assess its range and Section 2, also to date the deposit and to test its relationship with the kiln structure (Fig. 14). Further layers were identified beneath deposit 1014 and details of the sections and finds assemblages are tabulated below:

Table 12: Sample section through the made ground deposits to the south of the lime kiln

| **Section 1** (Fig. 18, S.9) | |
|---|---|
| **Context** | **Finds and notes** |
| 1014 | Pot (7) |
| 1012 =2029 | Pot (180), slag (4), lead (1), animal bone (207), CBM (7), iron (1) |
| Natural | - |
| **Section 2** (Fig. 18, S.10) | |
| **Context** | **Finds and notes** |
| 1018 =1014 | Pot (18), animal bone (21) |
| 1019 =1012 & 2025 | Pot (37), animal bone (418), shell (2), lead (7), iron (1), CBM (3), slag (10) |
| 2026 | Copper (1), animal bone (59), shell (2) |
| 2030 | - |
| Natural | - |

The excavation of Sections 1 and 2 produced a substantial assemblage of pottery sherds as well as a varied selection of other materials. Although not yet analysed by a specialist, a cursory examination of the assemblage suggests a solidly medieval date for the deposits to the south of the kiln. It is, therefore, possible that the building of the late medieval lime kiln truncated earlier medieval layers or, alternatively, 1014 and the underlying deposits were transported to site and deposited as made ground in order to raise and level off the local

ground surface. The latter supposition is preferred here as the pottery is highly fragmented and rolled indicating a degree of turbation, probably caused agricultural activity and/or perhaps by the procurement, transportation and deposition of the deposits. Furthermore, Sections 1 and 2 also demonstrated that the underlying natural deposits were encountered at increasingly greater depths southwards of the kiln structure, thus requiring the deposition of leveling deposits in order to gain access to the kiln around its complete circumference.

Two features (1021 and 1033) were identified in the base of Section 2. The small pit 1021 was likely a natural feature being the backfilled void left by a displaced cobble. Feature 1003 was only partially revealed in Section 2 making interpretation problematic, however, its sandy, silty fill was much more like the surrounding natural deposits rather than any of the archaeological deposits so far encountered. This suggests 1033 is also of natural origin, perhaps the result of a larger cobble being displaced or, more likely, a periglacial feature.

Several other archaeological features were identified during the open area excavation and they are tabulated below.

Table 13: Archaeological features in the Open Area Excavation

| **Context** | **Fill(s)** | **Type** | **Finds (No.), [samples], notes** |
|---|---|---|---|
| 118 | 119 | Posthole/pit | Animal bone (26), glass (1). [6]. Excavated in Evaluation Trench 6 |
| 1007 | 1006 | Pit | Pot (19), animal bone (33). [2]. (Fig. 18, S.11) |
| | 1009 | | Animal bone (7). [3] |
| 1010 | 1011 | Pit | Pot (1). Small pit cut into the top fill (1006) of pit 1007 |
| 2003 | 2001 | Pit? | Pot (8), animal bone (6), slag (4), daub? (2) |
| | 2002 | | Pot (1), animal bone (4), slag (2), daub? (5) [1] |
| 2005 | 2004 | Natural | - |
| 2007 =173 | 2006 | Gully | Animal bone (4). [2]. (173 in Evaluation Trench 6) |
| 2008 | 2009 | Pit | Pot (1), animal bone (2), shell (1), CBM(1) |
| 2010 | 2011 | Pit | Pot (4), animal bone (7), CBM (1) |
| 2012 | 2013 | Pit | Pot (8), animal bone (21), shell (1), copper (1), CBM (4) |
| 2020 | 2015 | Pit | Pot (3), animal bone (352), shell (1), iron (1), CBM(2) |
| | 2016 | | Animal bone (47), shell (1), slag (1) |
| | 2017 | | Animal bone (3) |
| | 2018 | | Animal bone (15), CBM(1) |
| | 2019 | | (Fig. 18, S.12) |
| 2021 | 2022 | Pit | Animal bone (1) |
| 2023 | 2033 | Pit | Pot (2), shell (1), copper (1), flint (2), slag (2) |
| | 2024 | | Animal bone (3), iron (3). (Fig. 18, S.13) |
| 2028 | 2027 | Pit | Flint (1), animal bone (3), [4] |
| 2031 | 2032 | Pit | Animal bone (23), shell (1), daub? (1), charcoal (1) |

With the exception of gully 2007 and the potentially prehistoric pit 2028, these features appear to be rubbish pits. The finds assemblage recovered from these features has yet to be

subject to specialist examination; however, cursory inspection of the datable material suggests that the features, with the exception of Pit 2028, are medieval in date. It is not possible at this stage to suggest any phasing of these features but it is likely that they represent a period of on site activity prior to the construction of the late medieval lime kiln.

## 6 Artefact Record

At this interim stage of reporting, no specialist finds reports have been commissioned and so the finds assemblage has been tabulated and included in Appendix 6.

## 7 Environmental Record

Twenty-five environmental samples were taken during the archaeological evaluation and subsequent excavation. These have been processed by ASWYAS and currently await specialist analysis.

## 8 Recommendations for Final Reporting

Prior to final reporting, the finds assemblage and environmental samples must be subject to specialist analysis and material specific reports must be produced for incorporation into the final report. Following receipt of the specialist reports, it is possible the site narrative will require adjustment, which in turn may result in a reappraisal of the illustrations and plates included. Specialists may recommend that some artefacts are illustrated and that scientific dating may be required. Such requirements should be addressed prior to final reporting.

The final report will include the total findings resulting from the work to date and the subsequent mitigation works.

## 9 Discussion

### Geophysical survey

The earth resistance survey presents a non-complimentary data-set to the magnetic survey. The magnetic survey was affected by the close proximity of the existing building. It is possible that features of an archaeological nature may have been masked by the strong ferrous responses detected across the site.

The archaeology subsequently located during the evaluation was not identified in either survey partially due to magnetic materials in the topsoil, vegetation covering part of this feature and, possibly, the topsoil having been saturated by heavy rain. The earth resistance survey recorded an area of high resistance to the east of the kiln. It is unclear if the high

resistance anomalies recorded have been caused by modern material or archaeological remains.

**The archaeological evaluation**

*Trench 1*

The archaeological remains identified in Trench 1 consisted of a schoolyard wall and a brick-built water cistern serviced by at least three culverts. The wall, first apparent on the 1892 OS map and still extant on the map of 1929, was constructed over the top of one of the culverts indicating a pre-1892 date for the construction of the cistern. The backfill of the cistern construction cut produced pottery of 19th century date as did the fill of Culvert 142 confirming the structure is of the Victorian era.

At this juncture, it is not clear which structure or structures the cistern supplied with water but the school and the 18th to 19th century buildings to the west including the House of Correction are possibilities. Likewise, it is not apparent where the culverts collected water from or how many culverts serviced the cistern in total. Presumably the cistern collected rainwater and so it is possible that the culverts collected it from the fall pipes of local buildings. Only further excavation in the area of Trench 1 will help address these questions.

*Trench 2*

The archaeological remains in Trench 2 consisted of two walls at right angles, a post-hole, a pit and a cobble kerb edge with an associated lime mortar surface. The walls correspond with two sides of a rectangular building located up against the western boundary wall of the site first apparent on Humphries map of 1800, still extant on the OS map of 1892, but gone on the OS map of 1929. The finds from within the backfill of the structure suggest a 19th to 20th-century date for its demolition but do not indicate for what purpose the structure was used.

The remaining archaeological features were all sealed beneath a buried soil horizon and laid over or cut into the underlying natural deposits, which were encountered at 2.24m below the local ground surface. Unfortunately, no dating evidence was recovered from under the lime mortar surface or from the pit or posthole. However, given the exceptional depth at which the remains were encountered and the fact that the buried soil produced medieval pottery and early post-medieval clay tobacco pipe fragments, it is likely that the remains date to some time during the medieval period. A radiocarbon date from the animal bone recovered from the pit could substantiate this theory.

It should also be noted that these features could be associated with the mid 7th-century Scotch Monastery, which Jefferys' 1772 'Plan of Ripon' and the 1818 Langdale map suggest once stood on the site. Again, a radiocarbon date would be useful. To date, however, no structural evidence or artefacts have been recovered that are consistent with a monastic site of such early date. Nevertheless, some of the finds from the kiln backfill might be equated with a later monastic presence.

*Trench 4*

Trench 4 revealed rather ephemeral evidence for a structure in the form of a possible mortar wall footing. This possible foundation was associated with deposits that produced a mixed assemblage of pottery ranging in date from the medieval period to the 20th century. If the remains are those of a structure, they are likely representative of relatively recent, short-term occupation or use of the site.

The possible wall footing and its construction cut truncated the upper backfill of a large probable quarry pit. The quarry pit backfill grew progressively deeper to the south-west end on the trench where the underlying natural deposits were encountered 2.80m below the local ground surface. A substantial assemblage of animal bones was recovered from the quarry backfill but no dating evidence was identified. A 19th-century date for the quarrying, however, can be suggested with reference to the OS map of 1856. The map records the presence of a quarry pit towards the northern corner of the site and a second series of hachures suggest material might also have been removed from the south-west of the site near to where Trench 4 was positioned.

**The open area excavation**

The significant archaeological remains excavated in Trench 6 led to the open area excavation, which revealed a well preserved late medieval lime kiln with associated made ground deposits, several medieval rubbish pits, a medieval gully and a potentially prehistoric pit.

The potentially prehistoric pit contained a broken flint blade and poorly preserved bone. Analysis of the environmental sample taken from the pit may help to confirm a prehistoric date for this feature.

The medieval pits and gully produced an assemblage of finds typical of domestic waste, predominantly consisting of animal bone and pottery. However, no evidence for contemporary domestic structures was identified. Slag was also recovered in small quantities from some of the pits but no evidence of the industrial process that produced it was apparent. The pottery assemblage from the pits and gully date the features to well within the medieval period, seemingly somewhat earlier than the construction of the lime kiln.

*Lime kilns and lime burning*

The lime kiln is an industrial construction employed to convert limestone or chalk (calcium carbonate) in to quicklime (calcium oxide). This was achieved by stacking alternate layers of smashed stone and fuel (wood, charcoal or coal) within the kiln, sealing off the top with timbers and wet turf and maintaining a temperature of over 900ºc for up to two weeks. This heating process drives off the carbon dioxide thus leaving quicklime. The purity of the product would be quite variable depending on the completeness of the burning process, the fuel used and the skill of those using the kiln (Williams 2004).

In quicklime form, the product is extremely volatile and reacts violently with water producing extreme heat. The process of adding water to quicklime is known as slaking and produces hydrated lime (calcium hydroxide) in the form of a powder. Combining sand with the quicklime and water produces lime cement. Other ingredients were occasionally added such as tallow, beeswax, blood or bitumen to increase water resistance. By varying the ratios of the constituent parts, it is also possible to produce limewash, render and plaster (Williams 2004).

During the 16th century, it was discovered that the application of lime to farmland improved the lands fertility by neutralising soil acidity and breaking down heavy clay soils. This practice became more and more popular in the 17th century when the enclosure of common grazing land provided a big incentive for improving the land for the benefit of the owners (Askew 2003).

Lime kilns are industrial structures, up to about 15m across, the most prominent component being the firing pit. The fire pit is usually circular, as is the case at Ripon House, although square and rectangular versions are known (English Heritage 1989). The fire pits are generally 1.2m and 5m in diameter at the top of the pit although a 5.8m diameter pit was recorded at Bedford Castle (Hassal 1979). This makes the Ripon House kiln, with a diameter of 5.7m, one of the biggest yet discovered in the country.

The depth of the firing pit varied according to the design of the kiln; typically they were between 1m and 3m in depth, making the Ripon House example about average at a depth of 2.2m. In some cases, the chamber would have been built up above ground level as at North Elmham, Norfolk (Wade-Martins 1980), where the pit was only 0.3m in depth, in others the subterranean pit was the complete chamber. The sides of the pit were sometimes unlined as kiln I at Southampton Castle (Oxley 1986), sometimes clay lined as at Old Erringham, Sussex (Wilson and Hurst 1965), or were lined with stones as at Bedford Castle and Ripon House. In several cases, for example kiln II at Portchester, unlined pits were used and then later lined with stone (Cunliffe 1977). This may have occurred at Ripon House where the natural deposits behind the revetment wall were baked and reddened through firing.

The fire pit was serviced by between one and four flues, two being employed at Ripon House. The flues would have been used to supply and control the passage of air through the kiln whilst it was firing and may also have been used as stoke-holes and rakeout holes to remove the quicklime (English Heritage 1989). Often, the flues were simply holes in the fire pit wall with rakeout pits to the rear, as at Bedford (Hassal 1979). The tunnel flues recorded at Ripon House have a parallel in kiln I at Portchester Castle where the firing pit was linked to a rakeout pit by a tunnel 0.7m wide by 0.5m high and c1m in length. The south-eastern flue at Ripon House formed an aperture in the kiln wall 0.5m wide by 0.6m deep but the tunnel at 2.5m in length was much longer than the Portchester Castle example.

*The finds assemblage*

As noted above, the backfill of the fire pit and flues produced a substantial finds assemblage. The pottery included sherds of Cistercian Ware and Humber Ware, the former of which went into production in the latter part of the 16th century (Cumberpatch 2003). This suggests a similar date for the lime kiln falling out of use. The large quantity of animal bone, though yet to be analysed by a specialist, appears to consist of predominantly domestic species indicating the open pit was used for the disposal of food waste. It is, however, the remaining elements of the finds assemblage that raise intriguing possibilities regarding their origins.

The building materials recovered from the kiln backfill includes architectural masonry, roofing lead (Plate 22), window lead (cames) (plate 22) and painted glass quarries (Plates 18-21). All these elements may originate from a single building or a complex of buildings that once stood on or close to the site. Of particular note are the glass quarries. Quarries are pieces of stained or painted glass that have cut to fit the cames of a stained glass window. During the medieval period, quarries were cut to fit the cames using a grozing iron, a tool which left a multi-facetted edge. Many of the quarries recovered from the kiln exhibit these tool marks. The presence of medieval quarries, as well as the lead and the various pieces of architectural masonry, probably represent a sample of residual material derived from ecclesiastical occupation on or close to the site earlier in the medieval. The case for ecclesiastical activity on or close to site is also supported by the inclusion of a small number of human bones in the kiln backfill. These remains may have originated from a burial ground associated with the suggested ecclesiastical buildings and possibly disturbed by the same event that caused the destruction of the buildings. Alternatively, the human bones may have originated from a disturbed graveyard directly to the west of site along the course of St Mary's Gate (Hall and Whyman 1996)

*The kiln in context*

The site on which the kiln stands has been encroached upon by the city of Ripon only as recently as the mid 20th century, indicating that the kiln was placed outside the medieval town. Lime kilns were often sited outside areas of settlement due high levels of caustic gases the lime burning process produced. When they occur in an urban setting, they are usually spatially associated with the building project they were intended to supply (English Heritage 1989). With no strong association with a contemporary structure the Ripon kiln is, therefore, likely to have supplied building projects within the medieval town.

Records regarding private building projects are highly unlikely to have survived until the modern era, however, ecclesiastical centres are more likely to retain such details. The Ripon kiln lies approximately 200m to the north-west of Ripon Cathedral and it is a matter of record that there was ongoing renovation and extension of the church between 1485 and 1547 (riponcathedral.org.uk); a period of time immediately before the abandonment of the kiln. These works consisted of the reconstruction of the central tower and the addition of the north

and south aisles, projects that would have required a regular supply of quicklime for the production of mortar.

## 10 Conclusions

The archaeological evaluation and subsequent excavation conducted within the grounds of Ripon House revealed archaeological remains dating to the prehistoric period, the medieval, the later medieval and the Victorian era. The prehistoric remains consisted of a single pit, which contained a broken flint blade. Analysis of the environmental sample taken from the pit may confirm the suggested prehistoric date.

No conclusive evidence of the 7th-century 'Scotch Monastery' was identified, however, the deeply buried kerb edge with associated mortar surface, the pit and post-hole in Trench 2 could yet prove to be part of that ecclesiastical complex. A radiocarbon date from the animal bone retrieved from the pit would be useful.

The collection of pits and the gully identified in the open area excavation indicate medieval activity on site but it appears limited to rubbish disposal. Of particular interest, and the target of the open area excavation, was the remains of a late medieval lime kiln. The kiln backfill contained evidence that the structure fell out of use during the later 16th century, whilst history indicates that building work on Ripon cathedral was ongoing throughout the first half of the 16th century.

Also included in the backfill of the kiln were pieces of architectural masonry, roofing lead, window lead, painted glass quarries and human bone. These residual building materials suggest that an ecclesiastical building(s) once stood on or close to the site and that it was demolished. The human bone may have originated from a burial ground associated with the building(s) or possibly from disturbed burials along the course of St Mary's Gate to the west of site.

The Victorian remains consisted of a schoolyard wall and a brick-built water cistern serviced by at least three culverts. The wall, first apparent on the 1892 OS map and still extant on the map of 1929, was constructed over the top of one of the culverts indicating a pre-1892 date for the construction of the cistern. The cistern and culverts combined is a substantial structure, the full extent of which is as yet unknown. If it is at risk from the development of the site, the structure should be fully exposed and recorded.

## 11 Future Mitigation Work

The Ripon House kiln has been preserved in situ. Details of the measures taken to infill it and protect it during the development programme are provided in Appendix 8.

It is probable that the lime kiln did not stand in isolation and so it is possible further archaeological remains may be located beneath where Ripon House now stands. Due to this possibility, the Harrogate Planning Officer has requested that a watching brief and subsequent rescue excavation are to be carried out by ASWYAS during the demolition of the former nursing home. The results of this investigation and those arising from the demolition phase will together inform an archaeological mitigation strategy for the construction phase.

On completion of all the mitigation works, the results will be collated and presented together in one final report, which will include the analysis of the various finds assemblages.

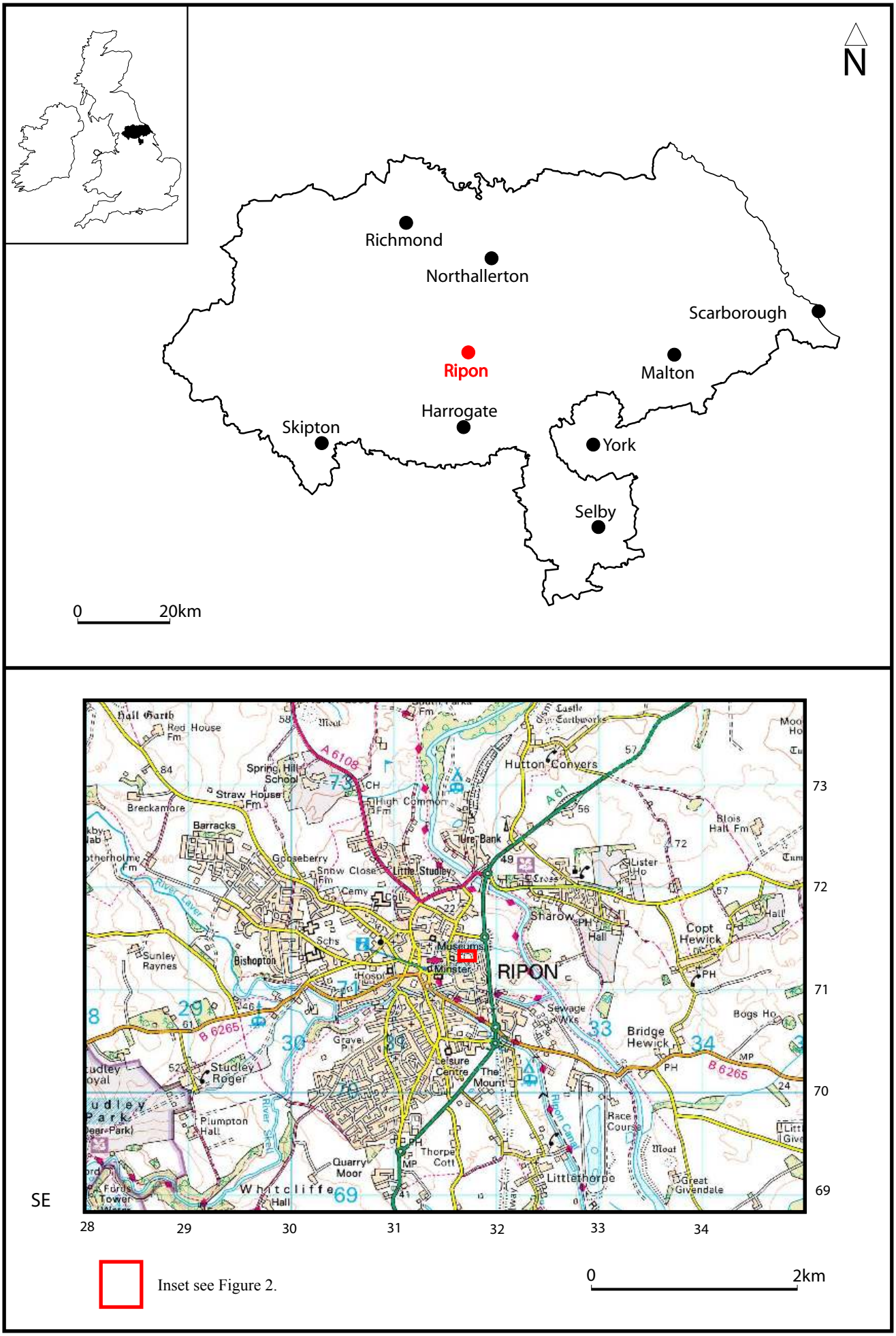


*Fig. 1. Site location*

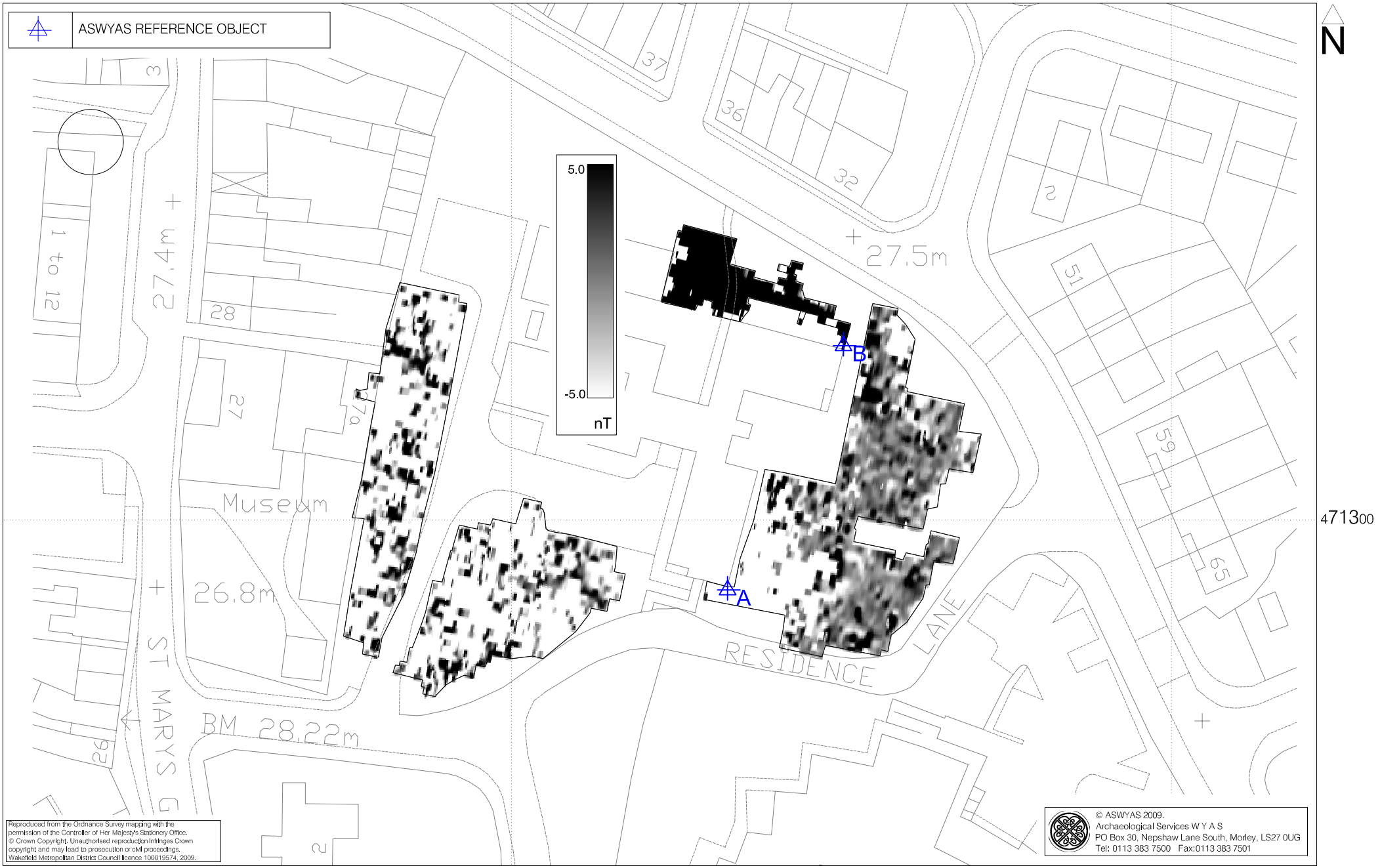


*Figure 2. Processed greyscale magnetometer data (1:750 @ A4)*


*Figure 3. XY trace plot of unprocessed magnetometer data (1:750 @ A4)*


*Figure 4. Interpretation of magnetometer data (1:750 @ A4)*


*Figure 5. Processed greyscale earth resistance data (1:750 @ A4)*


*Figure 6. Unprocessed greyscale earth resistance data (1:750 @ A4)*

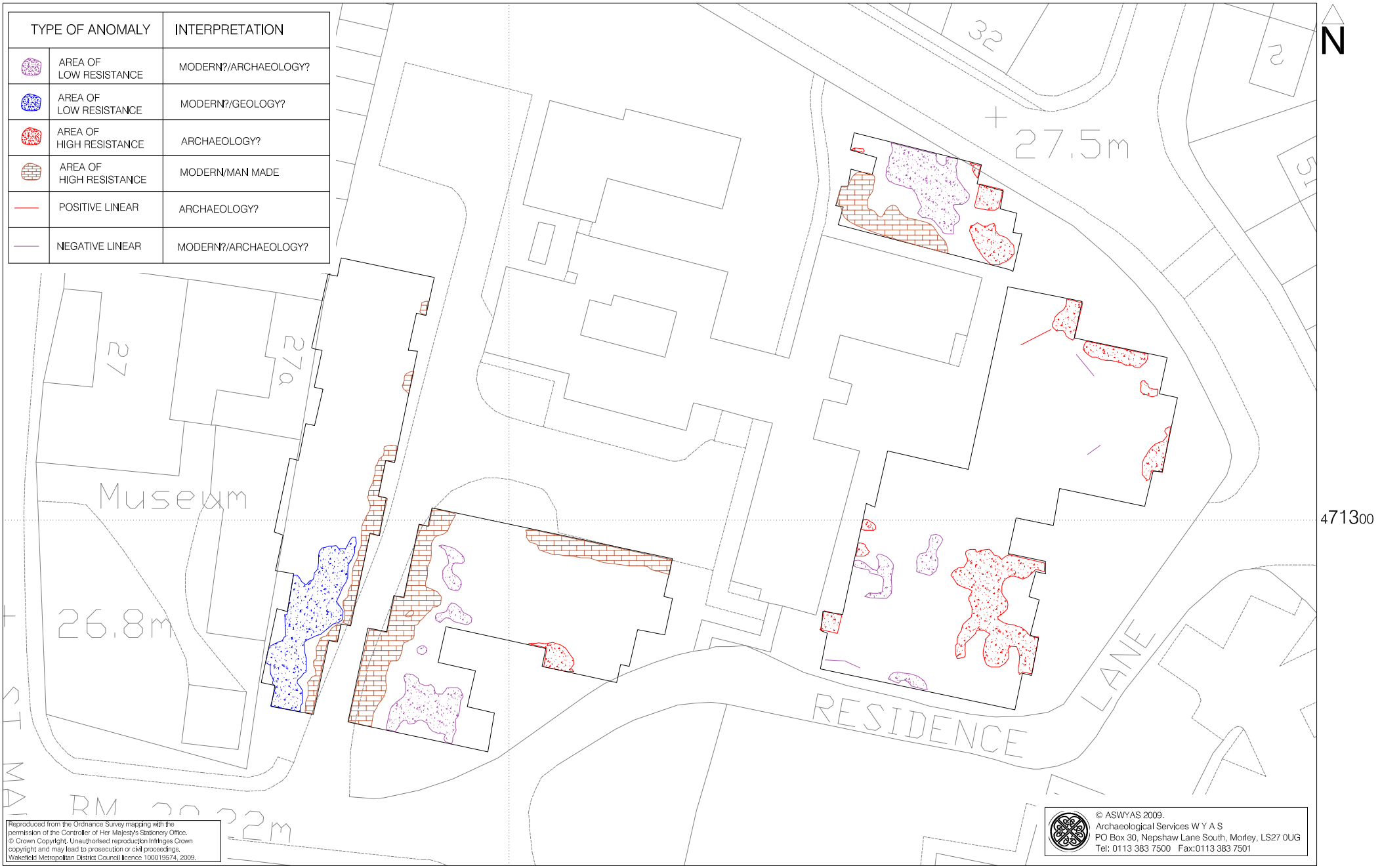


*Figure 7. Interpretation of earth resistance data (1:750 @ A4)*

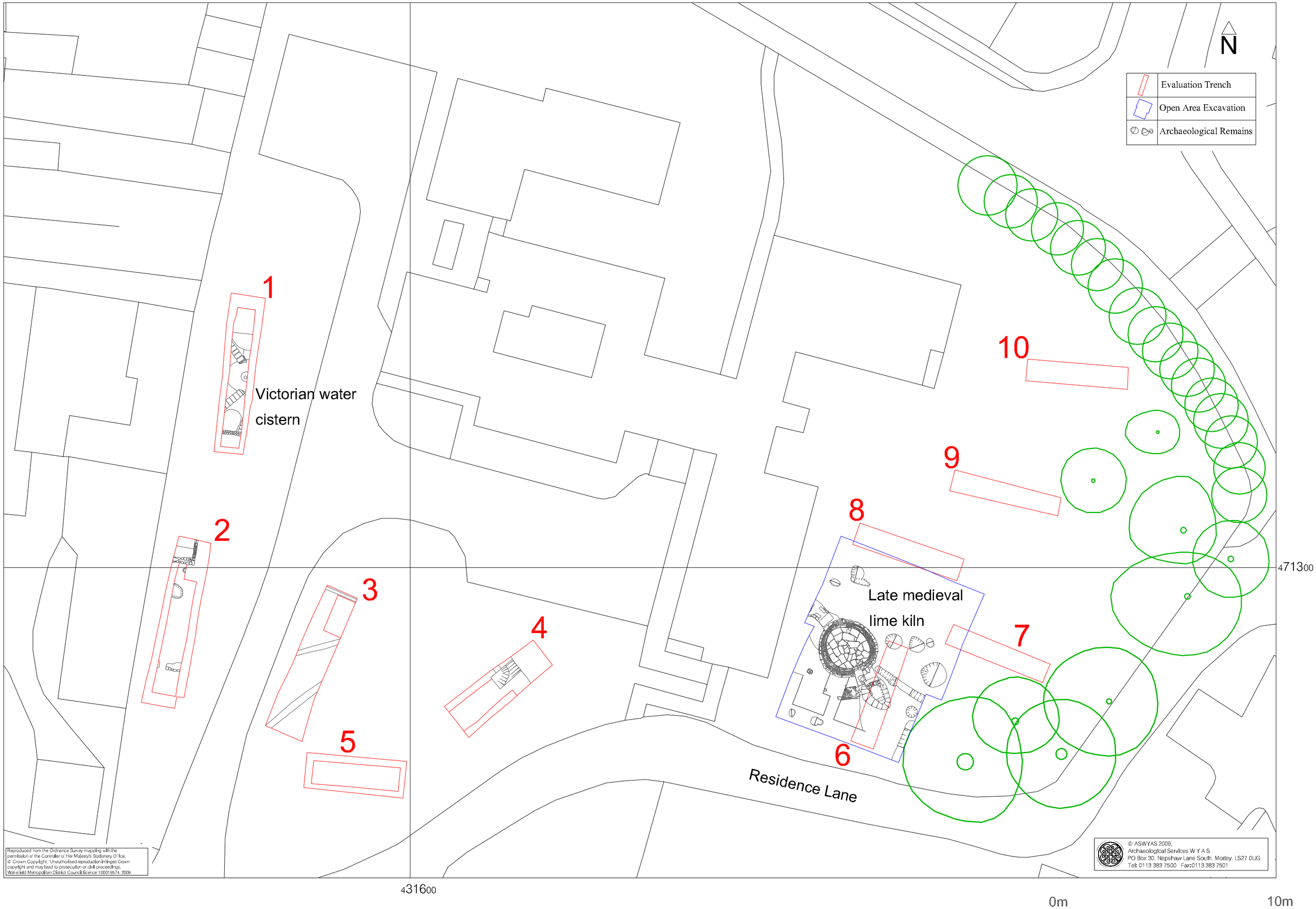


*Fig. 8. Trench location (1:300 @ A3)*

N

| | |
|---|---|
| | Evaluation Trench Edge |
| | Archaeological Remains |

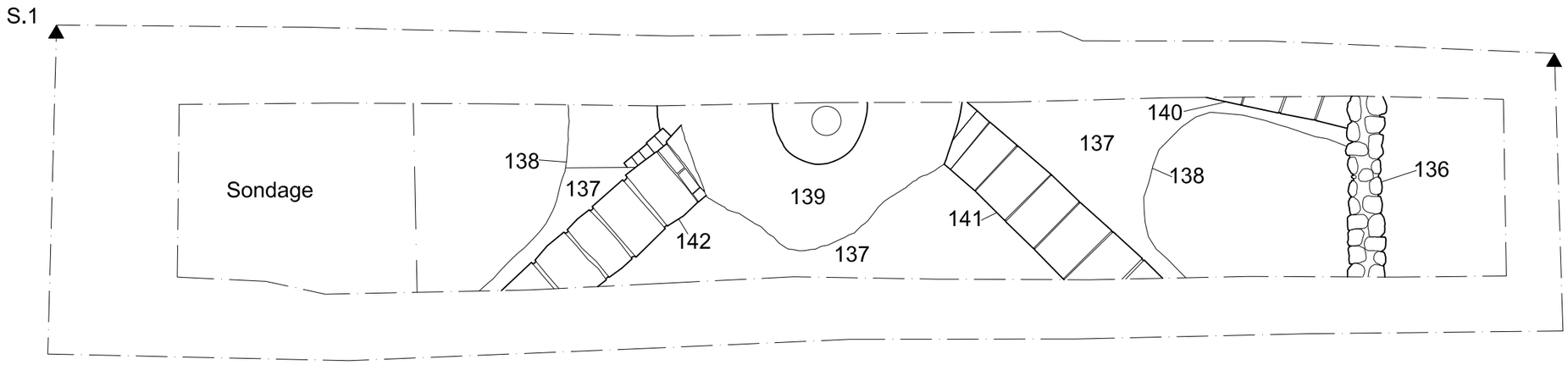



*Fig. 9: The archaeological remains in Trench 1 (1:50 @ A3)*


Archaeological Services W Y A S
PO Box 30, Nepshaw Lane South, Morley, LS27 0UG
Tel: 0113 383 7500 Fax:0113 383 7501

N

Evaluation Trench Edge

Archaeological Remains

S.2

113

122

162

146

145

144

143

112

113

0m

5m

*Fig. 10: The archaeological remains in Trench 2 (1:50 @ A3)*


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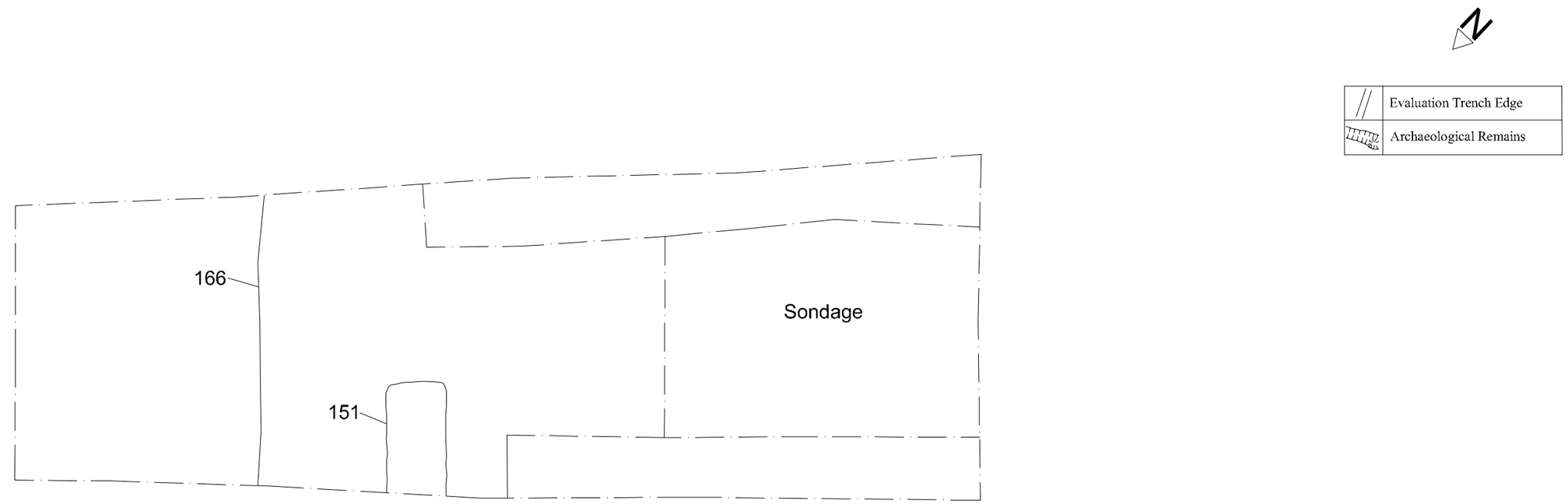
Tel: 0113 383 7500 Fax:0113 383 7501




## Trench 4 following the excavation of 151

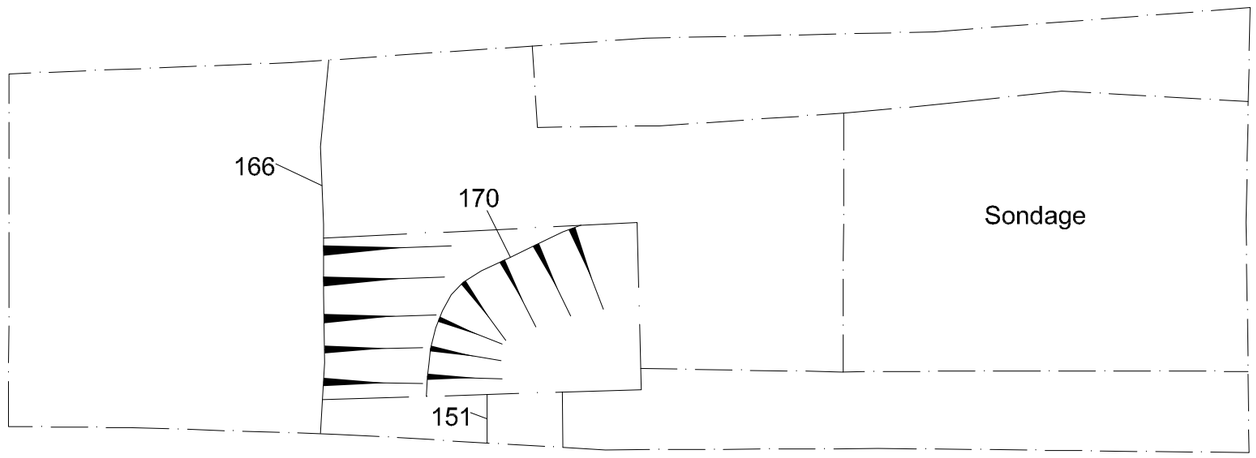



*Fig. 11. The archaeological remains in Trench 4 (1:50 @ A3)*

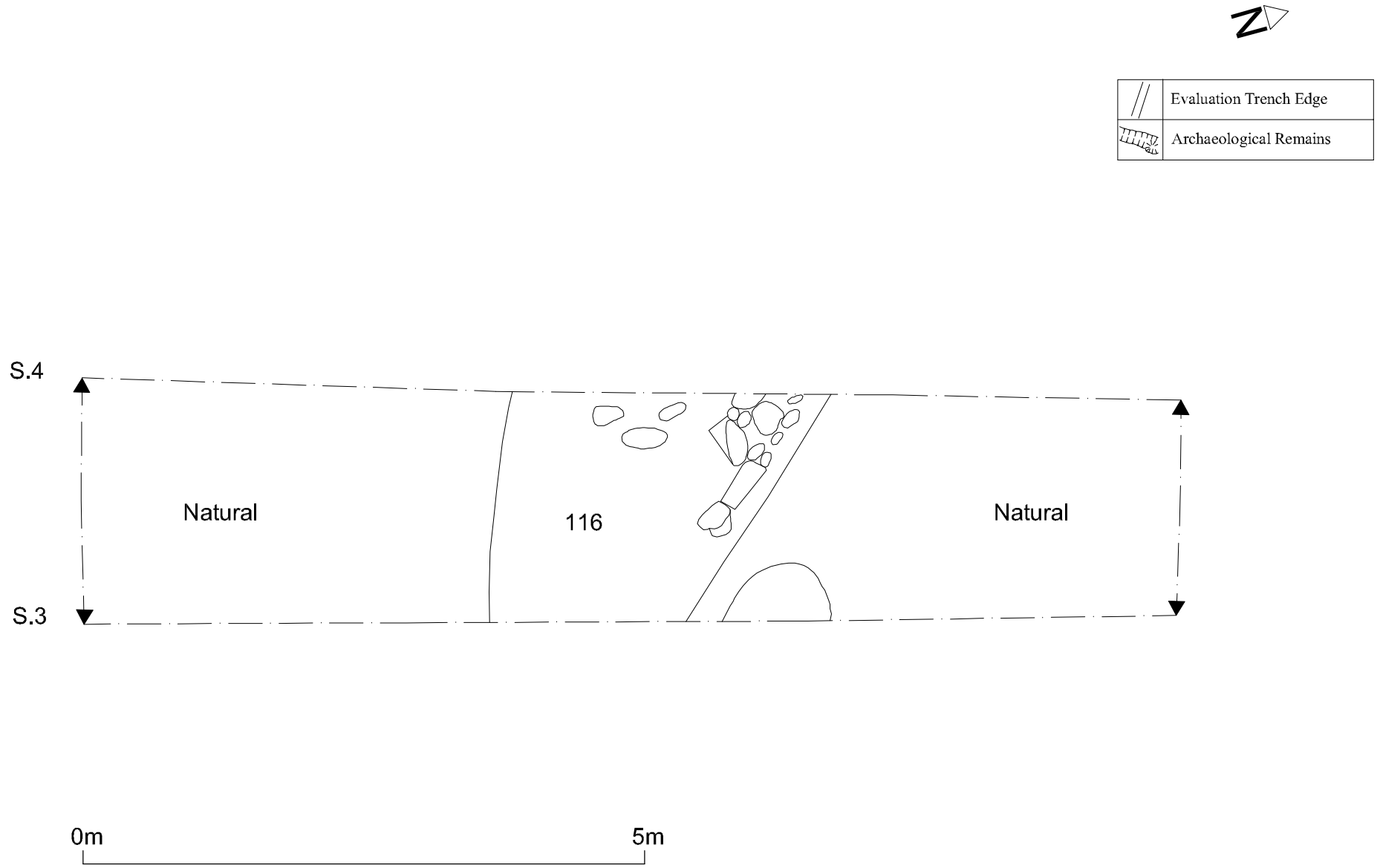



*Fig. 12. The archaeological remains in Trench 6, pre-excavation (1:50 @ A4)*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Tel: 0113 383 7500 Fax:0113 383 7501


| | |
|---|---|
| | Evaluation Trench Edge |
| | Archaeological Remains |

Fig. 13a

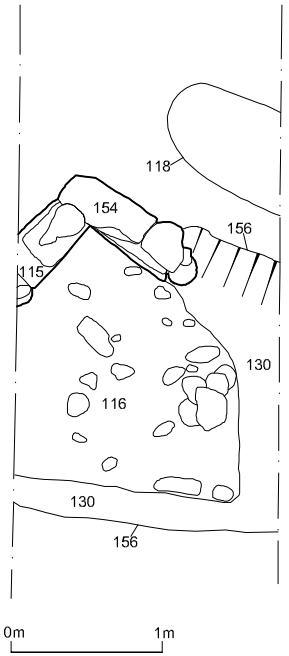



Fig. 13b

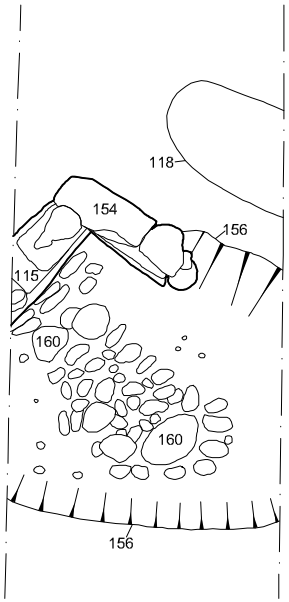
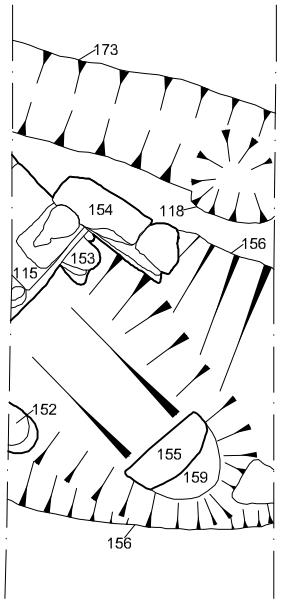



Fig. 13c




*Figs 13a,b and c. Sequence of overlaid plans of the archaeological remains in Trench 6 (1:50 @ A4)*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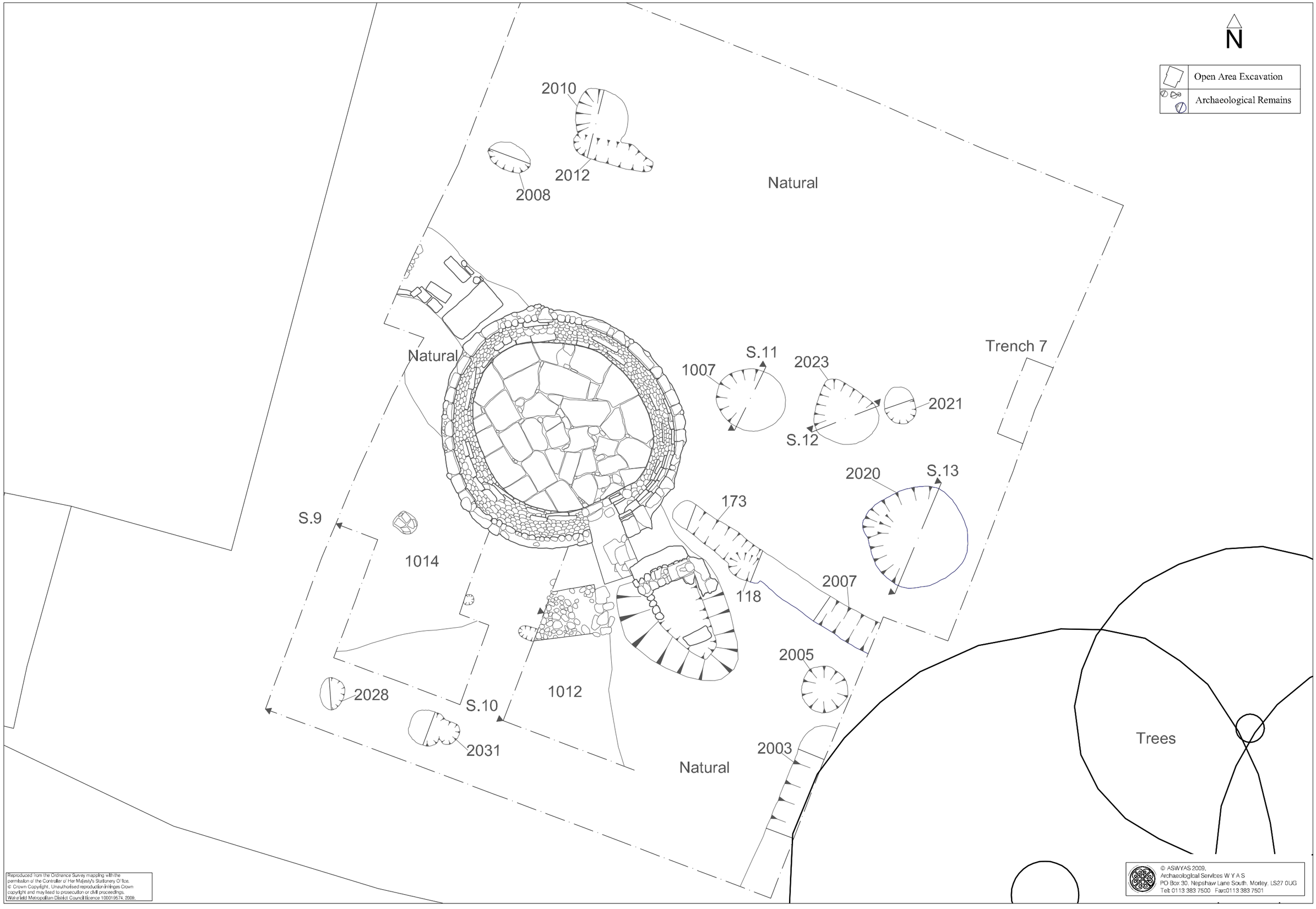
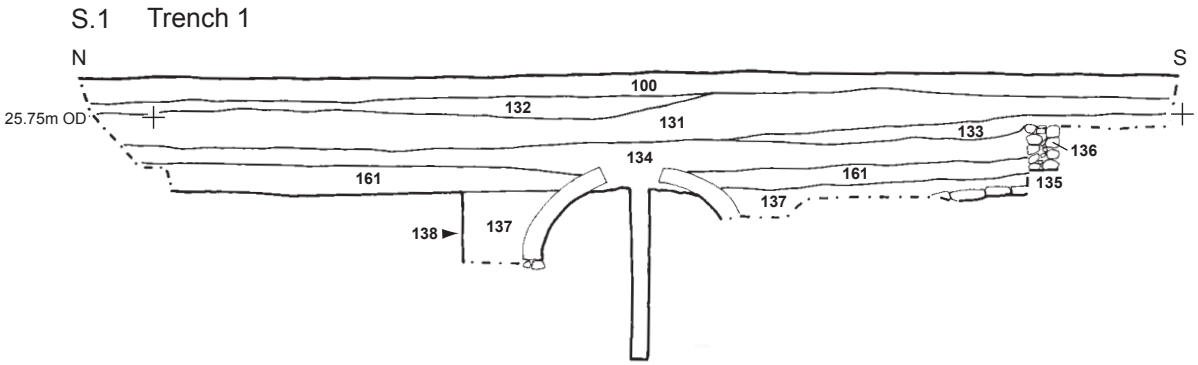
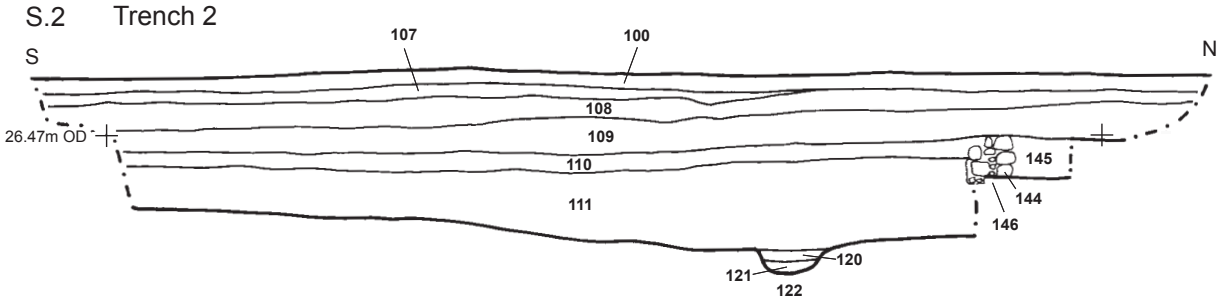
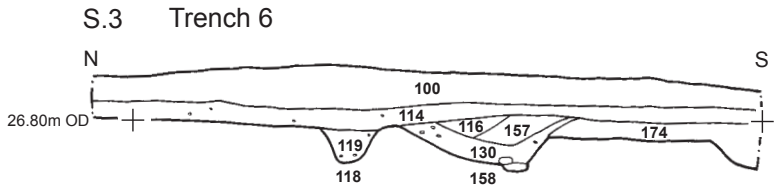



*Fig. 14: Plan of archaeological remains in the open area excavation - expansion of Trench 6 (1:75 @ A3)*



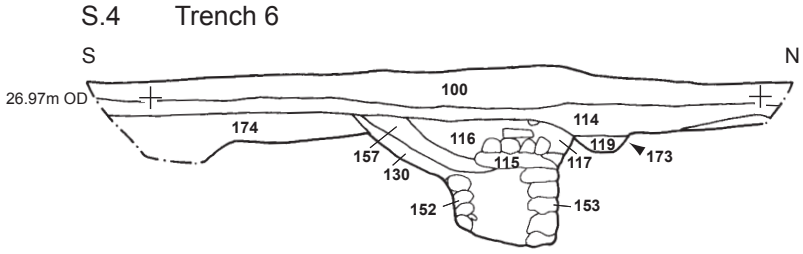





*Fig. 15. Sections 1-4 (scale 1:100)*

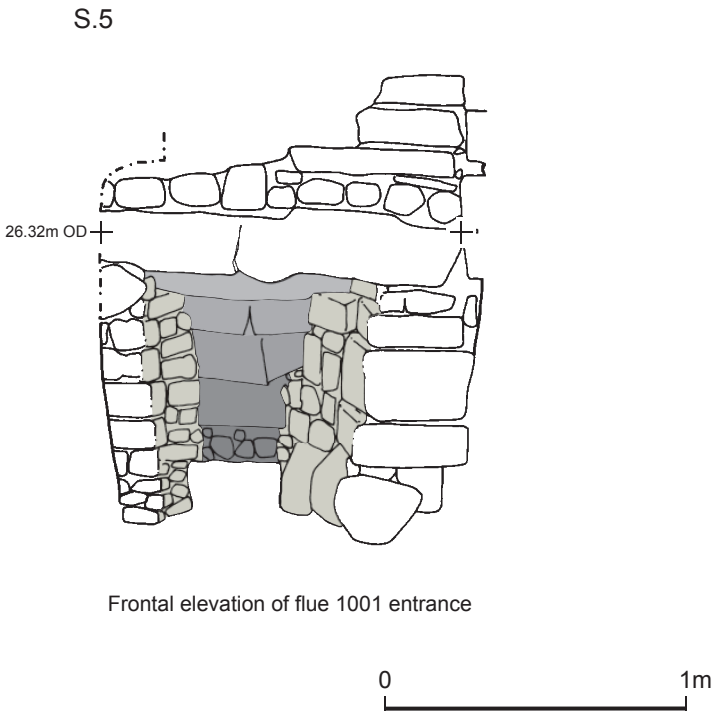
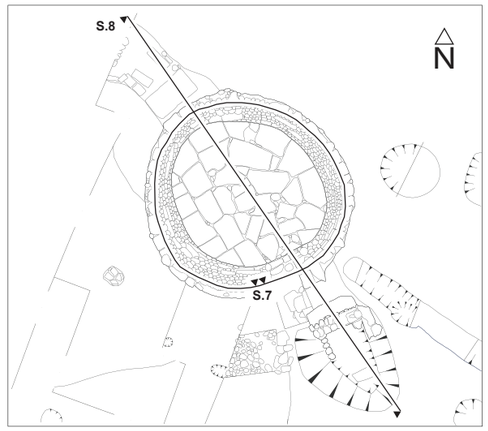
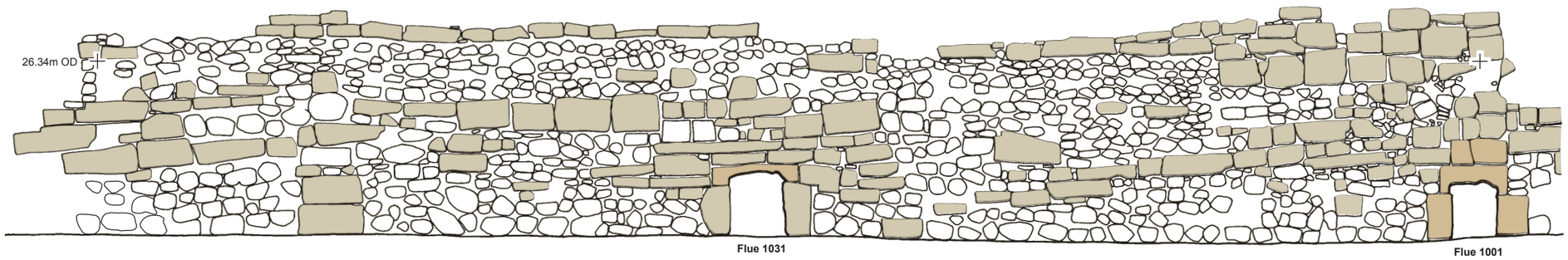



*Fig. 16. Sections 5 & 6 (scales S.5 1:25, S.6 1:50)*




S.7

Elevation drawing of the fire pit revetment wall



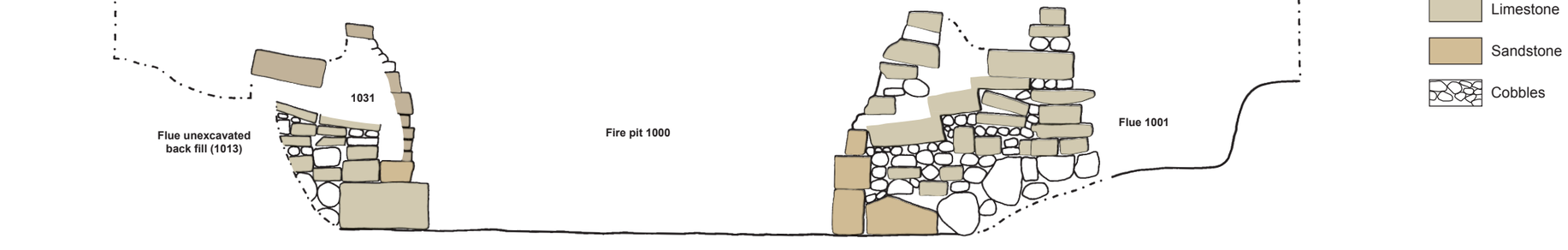

S.8

NW

27.48m OD

Cross section through the kiln flues and fire pit

SE




0 2m

*Fig. 17. Sections 7 & 8 (scale 1:50)*

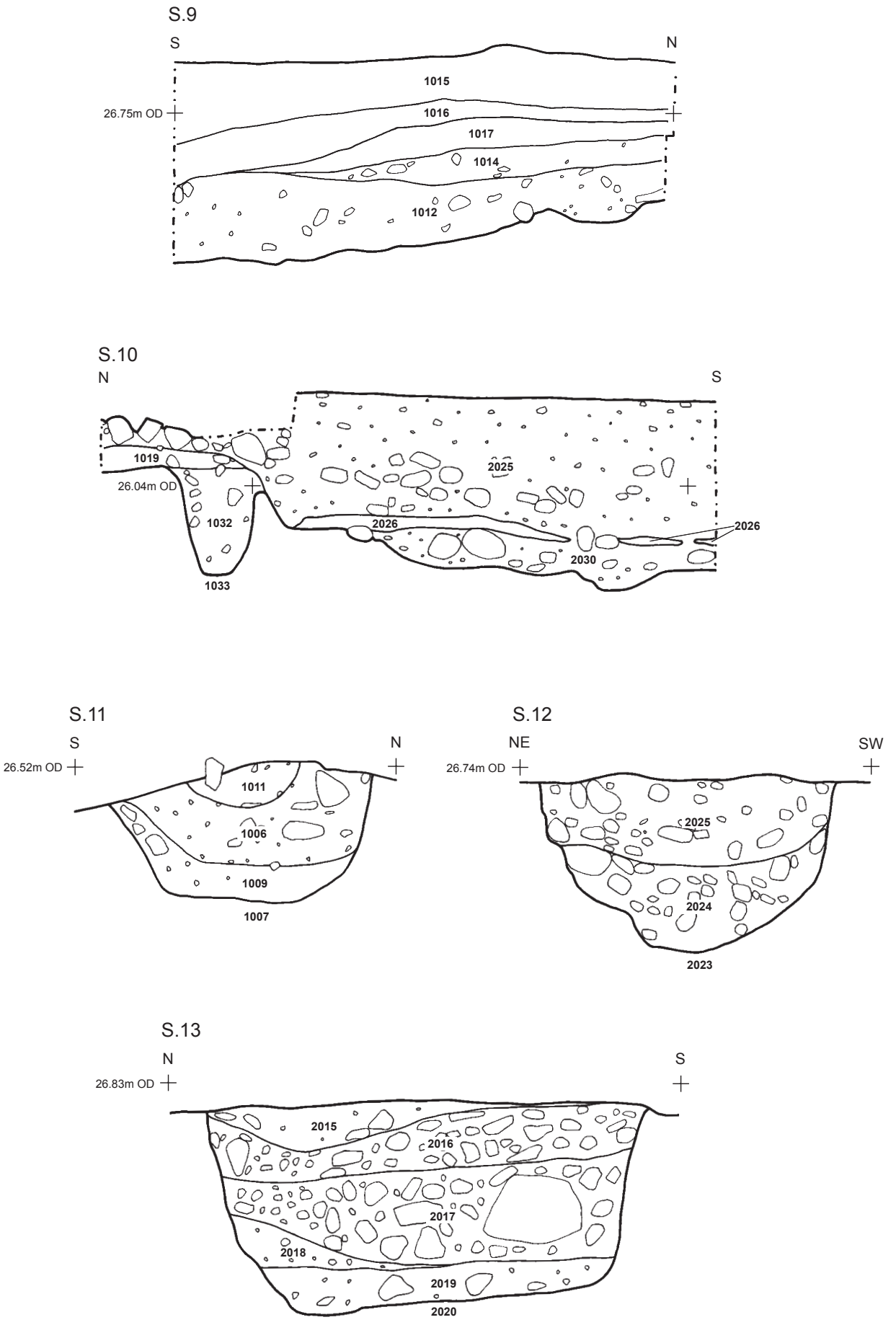



*Fig. 18. Open area excavation. Sections 9-13 (scale 1:25)*

Plate 1: Cobble wall 136 built over the top of culvert 140. Trench 1, view south

Plate 2: The water cistern 139 with culverts 142 (left) and 141 (right). Trench 1, View east

Plate 3: Capping stones of culvert 142 removed revealing silt trap. Trench 1, view south-east

Plate 4: Structure 175. Trench 2, view south

Plate 5: Cobble kerb edge 112 with associated lime mortar surface 113. Trench 2, view east

Plate 6: Wattle impressions in the underside of mortar surface 113 in Trench 2

Plate 7: Chalky deposit 116 and associated walls 115 and 154 (pre-excavation). Trench 6, view west

Plate 8: Demolition rubble 160 in base of construction cut 158. Trench 6, view west

Plate 9: Some of the flatter stones in deposit 160 placed on edge up against wall 115. Trench 6, view north-west

Plate 10: View into structure 1001 from the trench edge. Trench 6, view north-west

Plate 11: View into structure 1001

Plate 12: Section through the fire pit backfill deposits, view south-east

Plate 13: Elevated view of the excavated lime kiln, view north-west

Plate 14: View of the excavated lime kiln with flue 1001 in the foreground, view north-west

Plate 15: Internal aperture of flue 1001, view south-east

Plate 16: Internal aperture of flue 1031, view north-west

Plate 17: Remnants of render deposit in the fire pit wall



Plates 18 and 19: Medieval painted glass from the fill of the kiln


Plate 20: An almost complete medieval glass quarry (left); and
Plate 21: Medieval painted glass with cross-hatch design (right). All from the kiln fill

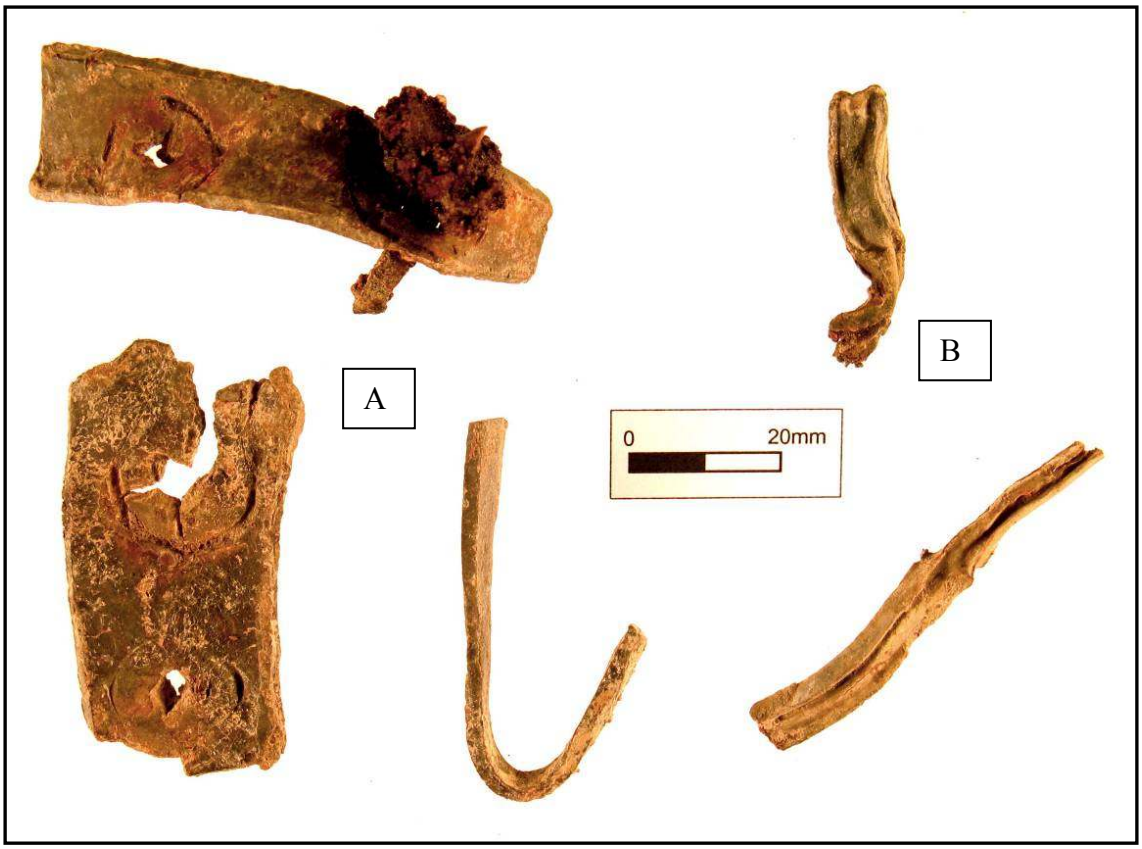



Plate 22: Three lead roofing fitting (A) and two sections of lead window cames (B) from the fill of the kiln

# Appendix 1: Magnetic Survey – technical information

## Magnetic Susceptibility and Soil Magnetism

Iron makes up about 6% of the Earth's crust and is mostly present in soils and rocks as minerals such as maghaemite and haemetite. These minerals have a weak, measurable magnetic property termed magnetic susceptibility. Human activities can redistribute these minerals and change (enhance) others into more magnetic forms so that by measuring the magnetic susceptibility of the topsoil, areas where human occupation or settlement has occurred can be identified by virtue of the attendant increase (enhancement) in magnetic susceptibility. If the enhanced material subsequently comes to fill features, such as ditches or pits, localised isolated and linear magnetic anomalies can result whose presence can be detected by a magnetometer (fluxgate gradiometer).

In general, it is the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of topsoils, subsoils and rocks into which these features have been cut, which causes the most recognisable responses. This is primarily because there is a tendency for magnetic ferrous compounds to become concentrated in the topsoil, thereby making it more magnetic than the subsoil or the bedrock. Linear features cut into the subsoil or geology, such as ditches, that have been silted up or have been backfilled with topsoil will therefore usually produce a positive magnetic response relative to the background soil levels. Discrete feature, such as pits, can also be detected.

The magnetic susceptibility of a soil can also be enhanced by the application of heat. This effect can lead to the detection of features such as hearths, kilns or areas of burning.

## Types of Magnetic Anomaly

In the majority of instances anomalies are termed 'positive'. This means that they have a positive magnetic value relative to the magnetic background on any given site. However some features can manifest themselves as 'negative' anomalies that, conversely, means that the response is negative relative to the mean magnetic background.

Where it is not possible to give a probable cause of an observed anomaly a '?' is appended.

It should be noted that anomalies interpreted as modern in origin might be caused by features that are present in the topsoil or upper layers of the subsoil. Removal of soil to an archaeological or natural layer can therefore remove the feature causing the anomaly.

The types of response mentioned above can be divided into five main categories that are used in the graphical interpretation of the magnetic data:

*Isolated dipolar anomalies (iron spikes)*

These responses are typically caused by ferrous material either on the surface or in the topsoil. They cause a rapid variation in the magnetic response giving a characteristic 'spiky' trace. Although ferrous archaeological artefacts could produce this type of response, unless there is supporting evidence for an archaeological interpretation, little emphasis is normally

given to such anomalies, as modern ferrous objects are common on rural sites, often being present as a consequence of manuring.

*Areas of magnetic disturbance*

These responses can have several causes often being associated with burnt material, such as slag waste or brick rubble or other strongly magnetised/fired material. Ferrous structures such as pylons, mesh or barbed wire fencing and buried pipes can also cause the same disturbed response. A modern origin is usually assumed unless there is other supporting information.

*Linear trend*

This is usually a weak or broad linear anomaly of unknown cause or date. These anomalies are often caused by agricultural activity, either ploughing or land drains being a common cause.

*Areas of magnetic enhancement/positive isolated anomalies*

Areas of enhanced response are characterised by a general increase in the magnetic background over a localised area whilst discrete anomalies are manifest by an increased response (sometimes only visible on an XY trace plot) on two or three successive traverses. In neither instance is there the intense dipolar response characteristic exhibited by an area of magnetic disturbance or of an 'iron spike' anomaly (see above). These anomalies can be caused by infilled discrete archaeological features such as pits or post-holes or by kilns. They can also be caused by pedological variations or by natural infilled features on certain geologies. Ferrous material in the subsoil can also give a similar response. It can often therefore be very difficult to establish an anthropogenic origin without intrusive investigation or other supporting information.

*Linear and curvilinear anomalies*

Such anomalies have a variety of origins. They may be caused by agricultural practice (recent ploughing trends, earlier ridge and furrow regimes or land drains), natural geomorphological features such as palaeochannels or by infilled archaeological ditches.

**Methodology: Magnetic Susceptibility Survey**

There are two methods of measuring the magnetic susceptibility of a soil sample. The first involves the measurement of a given volume of soil, which will include any air and moisture that lies within the sample, and is termed volume specific susceptibility. This method results in a bulk value that it not necessarily fully representative of the constituent components of the sample. The second technique overcomes this potential problem by taking into account both the volume and mass of a sample and is termed mass specific susceptibility. However, mass specific readings cannot be taken in the field where the bulk properties of a soil are usually unknown and so volume specific readings must be taken. Whilst these values are not fully representative they do allow general comparisons across a site and give a broad indication of susceptibility changes. This is usually enough to assess the susceptibility of a site and evaluate whether enhancement has occurred.

**Methodology: Gradiometer Survey**

There are two main methods of using the fluxgate gradiometer for commercial evaluations. The first of these is referred to as ***magnetic scanning*** and requires the operator to visually identify anomalous responses on the instrument display panel whilst covering the site in widely spaced traverses, typically 10m apart. The instrument logger is not used and there is therefore no data collection. Once anomalous responses are identified they are marked in the field with bamboo canes and approximately located on a base plan. This method is usually employed as a means of selecting areas for detailed survey when only a percentage sample of the whole site is to be subject to detailed survey.

The disadvantages of magnetic scanning are that features that produce weak anomalies (less than 2nT) are unlikely to stand out from the magnetic background and so will be difficult to detect. The coarse sampling interval means that discrete features or linear features that are parallel or broadly oblique to the direction of traverse may not be detected. If linear features are suspected in a site then the traverse direction should be perpendicular (or as close as is possible within the physical constraints of the site) to the orientation of the suspected features. The possible drawbacks mentioned above mean that a 'negative' scanning result should be validated by sample detailed magnetic survey (see below).

The second method is referred to as ***detailed survey*** and employs the use of a sample trigger to automatically take readings at predetermined points, typically at 0.25m intervals, on zig-zag traverses 1m apart. These readings are stored in the memory of the instrument and are later dumped to computer for processing and interpretation. Detailed survey allows the visualisation of weaker anomalies that may not have been detected by magnetic scanning.

During this survey a Bartington Grad601 magnetic gradiometer was used taking readings on the 0.1nT range, at 0.25m intervals on zig-zag traverses 1m apart within 20m by 20m square grids. The instrument was checked for electronic and mechanical drift at a common point and calibrated as necessary. The drift from zero was not logged.

**Data Processing and Presentation**

The detailed gradiometer data has been presented in this report in XY trace and greyscale formats. In the former format the data shown is 'raw' with no processing other than grid biasing having been done. The data in the greyscale images has been interpolated and selectively filtered to remove the effects of drift in instrument calibration and other artificial data constructs and to maximise the clarity and interpretability of the archaeological anomalies.

An XY plot presents the data logged on each traverse as a single line with each successive traverse incremented on the Y-axis to produce a 'stacked' plot. A hidden line algorithm has been employed to block out lines behind major 'spikes' and the data has been clipped. The main advantage of this display option is that the full range of data can be viewed, dependent on the clip, so that the 'shape' of individual anomalies can be discerned and potentially

archaeological anomalies differentiated from 'iron spikes'. Geoplot 3 software was used to create the XY trace plots.

Geoplot 3 software was used to interpolate the data so that 1600 readings were obtained for each 20m by 20m grid. The same program was used to produce the greyscale images. All greyscale plots are displayed using a linear incremental scale.

# Appendix 2: Earth Resistance Survey – technical information

## Soil Resistance

The electrical resistance of the upper soil horizons is predominantly dependant on the amount and distribution of water within the soil matrix. Buried archaeological features, such as walls or infilled ditches, by their differing capacity to retain moisture, will impact on the distribution of sub-surface moisture and hence affect electrical resistance. In this way there may be a measurable contrast between the resistance of archaeological features and that of the surrounding deposits. This contrast is needed in order for sub-surface features to be detected by a resistance survey.

The most striking contrast will usually occur between a solid structure, such as a wall, and water-retentive subsoil. This shows as a resistive high. A weak contrast can often be measured between the infill of a ditch feature and the subsoil. If the infill material is soil it is likely to be less compact and hence more water retentive than the subsoil and so the feature will show as a resistive low. If the infill is stone the feature may retain less water than the subsoil and so will show as a resistive high.

The method of measuring variations in ground resistance involves passing a small electric current (1mA) into the ground via a pair of electrodes (current electrodes) and then measuring changes in current flow (the potential gradient) using a second pair of electrodes (potential electrodes). In this way, if a structural feature, such as a wall, lies buried in a soil of uniform resistance much of the current will flow around the feature following the path of least resistance. This reduces the current density in the vicinity of the feature, which in turn increases the potential gradient. It is this potential gradient that is measured to determine the resistance. In this case, the gradient would be increased around the wall giving a positive or high resistance anomaly.

In contrast a feature such as an infilled ditch may have a moisture retentive fill that is comparatively less resistive to current flow. This will increase the current density and decrease the potential gradient over the feature giving a negative or low resistance anomaly.

## Survey Methodology

The most widely used archaeological technique for earth resistance surveys uses a twin probe configuration. One current and one potential electrode (the remote or static probes) are fixed firmly in the ground a set distance away from the area being surveyed. The other current and potential electrodes (the mobile probes) are mounted on a frame and are moved from one survey point to the next. Each time the mobile probes make contact with the ground an electrical circuit is formed between the current electrodes and the potential gradient between the mobile and remote probes is measured and stored in the memory of the instrument.

A Geoscan RM15 resistance meter was used during this survey, with the instrument logging each reading automatically at 0.5m intervals on traverses 1m apart. The mobile probe spacing was 0.5m with the remote probes 15m apart and at least 15m away from the grid under

survey. This mobile probe spacing of 0.5m gives an approximate depth of penetration of 1m for most archaeological features.

## Appendix 3: Survey location information

The site grids were laid out using a Geodimeter 600s total station theodolite and tied in to the permanent landscape features and to temporary reference points (survey marker stakes) that were established and left in place following completion of the fieldwork for accurate geo-referencing. The locations of the temporary reference points are shown on Figure 2 and the Ordnance Survey grid co-ordinates tabulated below. The internal accuracy of the survey grid relative to these markers is better than 0.05m. The survey grids were then superimposed onto a map base provided by the client as a 'best fit' to produce the displayed block locations. Overall there was a good correlation between the local survey and the digital map base and it is estimated that the average 'best fit' error is better than ±1.5m.

| Station | Easting | Northing |
|---|---|---|
| A | 431632.7619 | 471289.3854 |
| B | 431650.3161 | 471326.4158 |

***Archaeological Services WYAS cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party or for the removal of any of the survey reference points.***

## Appendix 4: Geophysical archive

The geophysical archive comprises:-

- An archive disk containing compressed (WinZip 8) files of the raw data, report text (Microsoft Word 2000), and graphics files (Adobe Illustrator and AutoCAD 2008) files.
- A full copy of the report

At present the archive is held by Archaeological Services WYAS although it is anticipated that it may eventually be lodged with the Archaeology Data Service (ADS). Brief details may also be forwarded for inclusion on the English Heritage Geophysical Survey Database after the contents of the report are deemed to be in the public domain (i.e. available for consultation in the relevant Sites and Monument Record Office).

# Appendix 5: Inventory of primary archive

| Phase | File/Box No | Description | Quantity |
|---|---|---|---|
| Evaluation | File no.1 | Context register sheets | 4 |
| | File no.1 | Context cards for RHR09 3399 (nos. 100-180) | 181 |
| | File no.1 | Drawing sheet record | 1 |
| | File no.1 | Drawing register sheets | 1 |
| | File no.1 | Digital photo register sheets | 6 |
| | File no.1 | B&W photo register sheets | 3 |
| | File no.1 | B&W negative strips | 2 |
| | File no.1 | B&W contact sheets | 2 |
| | File no.1 | Colour photo register sheets | 3 |
| | File no.1 | Colour negative strips | 2 |
| | File no.1 | Film ID sheets | 3 |
| | File no.1 | Trench record sheets | 11 |
| | File no.1 | Daily site recording forms | 10 |
| | File no.1 | Sample register sheets | 1 |
| | File no.1 | Small find register sheets | 1 |
| | File no.1 | Form B sheets | 4 |
| Excavation I | File no. 2 | Context register sheets | 2 |
| | File no. 2 | Context cards for RHR09 3406 Kiln I (nos. 1000-1046) | 47 |
| | File no. 2 | Drawing sheet record | 1 |
| | File no. 2 | Drawing register sheets | 1 |
| | File no. 2 | Digital photo register sheets | 4 |
| | File no. 2 | B&W photo register sheets | 1 |
| | File no. 2 | B&W negative strips | 2 |
| | File no. 2 | B&W contact sheets | 2 |
| | File no.2 | Colour photo register sheets | 1 |
| | File no.2 | Film ID sheets | 1 |
| | File no.2 | Sample register sheets | 1 |
| | File no.2 | Daily site recording forms | 18 |
| | File no.2 | Form B sheets | 7 |
| | File no.2 | General correspondence and admin | 6 |
| Excavation II | File no.3 | Context register sheets | 2 |
| | File no.3 | Context cards for RHR09 3427 Kiln II (nos. 2000-2033) | 34 |
| | File no.3 | Drawing sheet record | 1 |

| Phase | File/Box No | Description | Quantity |
|---|---|---|---|
| | File no.3 | Drawing register sheets | 1 |
| | File no.3 | Sample register sheets | 1 |
| | File no.3 | Colour photo register sheets | 1 |
| | File no.3 | B&W photo register sheets | 1 |
| | File no.3 | Daily site recording forms | 7 |
| | File no.3 | Form B sheets | 4 |
| | File no.3 | General correspondence and admin | 2 |
| Evaluation and excavation | File no. 4 | Drawing sheets for RHR09 3399 Eval. (nos. 1-10)<br>Drawing sheets for RHR09 3406 Kiln I (nos. 1-11)<br>Drawing sheets for RHR09 3427 Kiln II (nos. 1-10) | 31 |

# Appendix 6: Concordance of contexts yielding artefacts or environmental remains

| Context | Area/Trench | Work Phase | Description | Artefacts and environmental samples |
|---|---|---|---|---|
| 100 | Trench 1-11 | Eval. | Topsoil | Coin (1) |
| 101 | Trench 4 | Eval. | First made layer | |
| 102 | Trench 4 | Eval. | Second made layer | |
| 103 | Trench 4 | Eval. | Third made layer | |
| 104 | Trench 4 | Eval. | Black layer | |
| 105 | Trench 4 | Eval. | Earth layer | Animal bone (6) |
| 106 | Trench 4 | Eval. | Natural gravel | Animal bone (59) oyster shell (2) |
| 107 | Trench 2 | Eval. | First made ground layer | |
| 108 | Trench 2 | Eval. | Second made ground layer | |
| 109 | Trench 2 | Eval. | Third made ground layer | |
| 110 | Trench 2 | Eval. | Fourth made layer | |
| 111 | Trench 2 | Eval. | Fifth made layer | Medieval pot (1) Med - H/W pot (6) clay pipe stem (1) CBM (9) glass (1) animal bone (54) oyster shell (1) |
| 112 | Trench 2 | Eval. | Wall footing | |
| 113 | Trench 2 | Eval. | Mortar/Limestone surface | Animal bone (33) Fe (2) mortar/daub (50) burnt bone (1) burnt shell (1) glass (1) charred material (1) Sample # 005 |
| 114 | Trench 6-11 | Eval. | Subsoil at the eastern half of the site | Glass (2) |
| 115 | Trench 6 | Eval. | Wall facings | |
| 116 | Trench 6 | Eval. | Crushed limestone layer | Animal bone (7) CBM (2) Fe (1) |
| 117 | Trench 6 | Eval. | Dark deposit in front of wall | Medieval pot (1) |
| 118 | Trench 6 | Eval. | Cut of posthole | |
| 119 | Trench 6 | Eval. | Fill of posthole 118 and beam slot 173 | Medieval pot (1) animal bone (29) burnt bone (1) glass (1) charred material (1) Sample # 006 |
| 120 | Trench 2 | Eval. | Fill of pit 122 | Animal bone (126) Fe (2) burnt bone (1) fired clay (1) mortar/daub (1) charred material (1) Sample # 001 |
| 121 | Trench 2 | Eval. | Fill of pit 122 | Animal bone (25) clinker (1) fired clay (1) burnt bone (1) mortar/daub (1) charred material (1) Sample # 002 |
| 122 | Trench 2 | Eval. | Cut of pit | |
| 123 | Trench 3 | Eval. | First made layer | |
| 124 | Trench 3 | Eval. | Gravel layer | |

| Context | Area/Trench | Work Phase | Description | Artefacts and environmental samples |
|---|---|---|---|---|
| 125 | Trench 3 | Eval. | Sandy layer | |
| 126 | Trench 3 | Eval. | Black earthy layer | |
| 127 | Trench 3 | Eval. | Made ground | |
| 128 | Trench 3 | Eval. | Black earthy layer | |
| 129 | Trench 3 | Eval. | Earth layer | |
| 130 | Trench 6 | Eval. | Dark earthy fill under limestone layer 116 | Medieval pot (7) animal bone (20) Fe (1) |
| 131 | Trench 1 | Eval. | Made ground | |
| 132 | Trench 1 | Eval. | Made ground | |
| 133 | Trench 1 | Eval. | Made ground | |
| 134 | Trench 1 | Eval. | Dark grey/black earthy deposit | Pot (1) H/W pot (8) animal bone (55) |
| 135 | Trench 1 | Eval. | Notional cut for wall 136 | |
| 136 | Trench 1 | Eval. | Cobble wall | |
| 137 | Trench 1 | Eval. | Back fill of sewer system excavation | Creamware C19 pot (4) |
| 138 | Trench 1 | Eval. | Construction cut for sewer system | |
| 139 | Trench 1 | Eval. | Bell sewer | |
| 140 | Trench 1 | Eval. | Culvert | |
| 141 | Trench 1 | Eval. | Culvert | |
| 142 | Trench 1 | Eval. | Culvert | |
| 143 | Trench 2 | Eval. | Brick wall | |
| 144 | Trench 2 | Eval. | Cobble wall | |
| 145 | Trench 2 | Eval. | Internal deposit in 144/143 | Pot (2) pot inc H/W (10) clay pipe bowl (4) clay pipe stem (5) ivory with Fe (1) oyster shell (4) glass (3) animal bone (108) CBM (1) |
| 146 | Trench 2 | Eval. | Foundation layer for 144 | |
| 147 | Trench 2 | Eval. | Cobbled surface next to 112 | |
| 148 | Trench 1 | Eval. | Possible subsoil deposit | |
| 149 | Trench 1 | Eval. | Basal fill of culvert | Pot (4) Creamware pot (1) animal bone (14) clinker (9) glass (1) ceramic sphere (1) charred material (1) fired clay (1) mortar/daub (1) Sample # 003 |
| 150 | Trench 1 | Eval. | Upper fill of culvert | Slag (10) clinker (50) animal bone (11) mortar/daub (1) fired clay (1) charred material (1) Sample # 004 |
| 151 | Trench 4 | Eval. | Mortar/Limestone wall footing | |
| 152 | Trench 6 | Eval. | Flue wall | |

| Context | Area/Trench | Work Phase | Description | Artefacts and environmental samples |
|---|---|---|---|---|
| 153 | Trench 6 | Eval. | Flue wall | |
| 154 | Trench 6 | Eval. | Wall butting 115 | |
| 155 | Trench 6 | Eval. | Step down to passage | |
| 156 | Trench 6 | Eval. | Same as 158 | |
| 157 | Trench 6 | Eval. | Limestone crush layer of 156 | |
| 158 | Trench 6 | Eval. | Construction cut of flue | |
| 159 | Trench 6 | Eval. | Fill under step 155 | |
| 160 | Trench 6 | Eval. | Rubble fill of 158 | |
| 161 | Trench 6 | Eval. | Mid grey brown soil/subsoil? layer | |
| 162 | Trench 2 | Eval. | Cut of pit/post hole | |
| 163 | Trench 2 | Eval. | Fill of pit/posthole 162 | Animal bone (2) |
| 164 | Trench 4 | Eval. | Deposit butting wall 151 | Medieval pot (5) Med – C19 (17) animal bone (84) |
| 165 | Trench 4 | Eval. | Fill of 166 | Slag (2) Fe (1) animal bone (35) |
| 166 | Trench 4 | Eval. | Cut of large pit | |
| 167 | Trench 4 | Eval. | Fill of 170 | |
| 168 | Trench 4 | Eval. | Fill of 170 | Medieval pot (2) C19 – C20 pot (2) Fe (1) animal bone (3) |
| 169 | Trench 4 | Eval. | Fill of 170 | Medieval pot (9) Med - C20 pot (5) CBM (2) animal bone (18) |
| 170 | Trench 4 | Eval. | Cut of large pit | |
| 171 | Trench 4 | Eval. | Construction cut for 151 | |
| 172 | Trench 4 | Eval. | Scree of natural on side of 166 | |
| 173 | Trench 6 | Eval. | Cut of possible beam slot | |
| 174 | Trench 6 | Eval. | Possible buried soil horizon | |
| 175 | Trench 2 | Eval. | Structure number, consists of walls 143 and 144 | |
| 176 | Trench 2 | Eval. | Construction cut for 175 | |
| 177 | Trench 2 | Eval. | Made ground | |
| 178 | Trench 5 | Eval. | Made ground | |
| 179 | Trench 5 | Eval. | Buried soil | |
| 180 | Trench 5 | Eval. | Quarry fill | |
| 1000 | Area 1 | Kiln I | Wall of circular lime kiln fire pit | |
| 1001 | Area 1 | Kiln I | Flue/stoke hole/ passage | |
| 1002 | Area 1 | Kiln I | Upper rubble backfill of 1000 | Pot (11) animal bone (124) worked stone (2) worked stone roof tile (1) worked stone with Fe (1) human bone (2) glass (1) |

| Context | Area/Trench | Work Phase | Description | Artefacts and environmental samples |
|---|---|---|---|---|
| 1003 | Area 1 | Kiln I | Grey sandy backfill of 1000, below 1002 | Pot (40) animal bone (769) animal bone with Fe (1) human bone (57) shell (23) Pb (131) Fe (1) magnetic material (1) CBM (31) charcoal (1) charred material (1) bead? (1) glass (27) plaster/daub (2) worked stone (2) Sample # 007 |
| 1004 | Area 1 | Kiln I | Dark grey deposit above 1001 | Animal bone (4) |
| 1005 | Area 1 | Kiln I | Red sand behind 1000 | Sample # 001 |
| 1006 | Area 1 | Kiln I | Fill of posthole 1007 | Pot (16) animal bone (33) charred material (1) Sample # 002 |
| 1007 | Area 1 | Kiln I | Cut of posthole | |
| 1008 | Area 1 | Kiln I | Post pad stones | |
| 1009 | Area 1 | Kiln I | Primary fill of 1007 | Animal bone (7) Sample # 003 |
| 1010 | Area 1 | Kiln I | Cut of feature in 1006 | |
| 1011 | Area 1 | Kiln I | Fill of 1010 | Pot (1) |
| 1012 | Area 1 | Kiln I | Black deposit TP1 | Pot (38) slag (2) Pb (1) animal bone (60) human bone (1) |
| 1013 | Area 1 | Kiln I | Backfill of northwest flue/stokehole 1031 | Pot (2) Pb (1) animal bone (6) |
| 1014 | Area 1 | Kiln I | Black deposit above 1012 TP1 | Pot (7) |
| 1015 | Area 1 | Kiln I | Topsoil = 100 | |
| 1016 | Area 1 | Kiln I | Light orange made ground = modern | |
| 1017 | Area 1 | Kiln I | Modern made ground below 1016 | |
| 1018 | Area 1 | Kiln I | Black deposit = 1014 TP2 | Pot (18) animal bone (21) |
| 1019 | Area 1 | Kiln I | Deposit below 1018 TP2 | Pot (25) animal bone (231) human bone (1) |
| 1020 | Area 1 | Kiln I | Fill of posthole 1021 | Sample # 004 |
| 1021 | Area 1 | Kiln I | Cut of posthole | |
| 1022 | Area 1 | Kiln I | Possible cut on outside of 1000 | |
| 1023 | Area 1 | Kiln I | Rubble below 1003, backfill of lime kiln fire pit 1000 | Pot (19) plaster and tile (4) flint (1) CBM (19) shell (12) Pb (6) glass (36) human bone (11) worked stone (3) worked stone with plaster (1) plaster? (1) animal bone (343) |
| 1024 | Area 1 | Kiln I | Plaster in northwest quadrant | Pot (1) animal bone (6) Fe (3) worked stone column (1) charcoal (1) charred material (1) magnetic material (1) Sample # 005 |
| 1025 | Area 1 | Kiln I | Plaster in southwest quadrant = 1024 | Fe (6) Pb (2) animal bone (4) daub? (13) charred material (1) Sample # 006 |

| Context | Area/Trench | Work Phase | Description | Artefacts and environmental samples |
|---|---|---|---|---|
| 1026 | Area 1 | Kiln I | Plaster in southeast quadrant = 1024 | Animal bone (3) charcoal (1) charred material (1) magnetic material (1) Sample # 008 |
| 1027 | Area 1 | Kiln I | Plaster in northeast = 1024 | Fe (3) animal bone (1) charred material (1) chalky/lime material (1) Sample # 009 |
| 1028 | Area 1 | Kiln I | Basal deposit within eastern vent 1001 | Fe (8) glass (1) burnt bone (15) charcoal (1) charred material (1) magnetic material (1) Sample # 010 |
| 1029 | Area 1 | Kiln I | Upper backfill of eastern vent 1001 | Animal bone (2) |
| 1030 | Area 1 | Kiln I | Cut for lime kiln 1000 | |
| 1031 | Area 1 | Kiln I | Flue/stoke hole associated with lime kiln 1000 | Pot (3) animal bone (5) |
| 1032 | Area 1 | Kiln I | Fill of 1033 | |
| 1033 | Area 1 | Kiln I | Cut of posthole/gully outside 1000 | |
| 1034 | Area 1 | Kiln I | Cobble deposit on top of 1019 | Glass (1) animal bone (24) pot (1) |
| 1035 | Area 1 | Kiln I | Red deposit under step in 1001 | Animal bone (8) charred material (1) Sample # 011 |
| 1036 | Area 1 | Kiln I | Dark deposit behind step in 1001 | Pot (4) animal bone (14) magnetic material (1) charred material (1) Sample # 012 |
| 1037 | Area 1 | Kiln I | Cut of east flue | |
| 1038 | Area 1 | Kiln I | Stone flag surface within 1000, 1001, 1031 | |
| 1039 | Area 1 | Kiln I | Red sand and gravel beneath 1038 | Animal bone (2) |
| 1040 | Area 1 | Kiln I | Clay and pebbles beneath 1045 | Plaster/daub (1) Sample # 013 |
| 1041 | Area 1 | Kiln I | Pinkish gravel behind 1000 | |
| 1042 | Area 1 | Kiln I | Pink/grey mixed deposit above 1001 | |
| 1043 | Area 1 | Kiln I | Backfill around top lintel of 1001 | |
| 1044 | Area 1 | Kiln I | Deposit above 1042 | |
| 1045 | Area 1 | Kiln I | Pink fill below 1039 | |
| 1046 | Area 1 | Kiln I | Cut of pit below 1038 | |
| 2000 | Area 1 | Kiln II | Topsoil | |
| 2001 | Area 1 | Kiln II | Fill of 2003 | Pot (8) animal bone (6) slag (4) daub? (2) |
| 2002 | Area 1 | Kiln II | Primary fill of 2003 | Pot (1) animal bone (4) slag (2) daub? (5) Sample # 001 |
| 2003 | Area 1 | Kiln II | Cut of gully? | |
| 2004 | Area 1 | Kiln II | Fill of natural feature 2005 | |
| 2005 | Area 1 | Kiln II | Cut of natural feature | |
| 2006 | Area 1 | Kiln II | Fill of gully 2007 | Animal bone (4) Sample # 002 |

| Context | Area/Trench | Work Phase | Description | Artefacts and environmental samples |
|---|---|---|---|---|
| 2007 | Area 1 | Kiln II | Cut of gully | |
| 2008 | Area 1 | Kiln II | Cut of pit | |
| 2009 | Area 1 | Kiln II | Fill of pit 2008 | Pot (1) animal bone (2) shell (1) CBM (1) Sample # 003 |
| 2010 | Area 1 | Kiln II | Cut of pit | |
| 2011 | Area 1 | Kiln II | Fill of pit 2010 | Pot (4) animal bone (7) CBM (1) |
| 2012 | Area 1 | Kiln II | Cut of elongated pit | |
| 2013 | Area 1 | Kiln II | Fill of elongated pit 2012 | Pot (8) animal bone (21) shell (1) Cu alloy (1) CBM (4) |
| 2014 | Area 1 | Kiln II | Natural | |
| 2015 | Area 1 | Kiln II | Fill of pit 2020 | Pot (3) animal bone (354) shell (1) Fe nail (1) CBM (2) |
| 2016 | Area 1 | Kiln II | Fill of pit 2020 | Animal bone (47) shell (1) slag (1) |
| 2017 | Area 1 | Kiln II | Fill of pit 2020 | Animal bone (3) |
| 2018 | Area 1 | Kiln II | Fill of pit 2020 | Animal bone (15) CBM (1) |
| 2019 | Area 1 | Kiln II | Fill of pit 2020 | |
| 2020 | Area 1 | Kiln II | Cut of pit | |
| 2021 | Area 1 | Kiln II | Cut of pit | |
| 2022 | Area 1 | Kiln II | Fill of pit 2021 | Animal bone (1) |
| 2023 | Area 1 | Kiln II | Cut of pit | |
| 2024 | Area 1 | Kiln II | Basal fill of pit 2023 | Animal bone (3) Fe object (3) |
| 2025 | Area 1 | Kiln II | Top layer in slot 2 | Pot (14) animal bone (187) shell (3) CBM (3) slag (10) Pb (7) Fe object (3) Cu alloy (1) flint (2) |
| 2026 | Area 1 | Kiln II | Charcoal and burnt clay layer slot 2 | Animal bone (59) shell (2) Cu alloy (1) charcoal (1) Sample # 005 |
| 2027 | Area 1 | Kiln II | Fill of pit 2028 | Animal bone (3) Flint (1) Sample # 004 |
| 2028 | Area 1 | Kiln II | Cut of pit | |
| 2029 | Area 1 | Kiln II | Same as 2025- slot 1 | Pot (142) animal bone (147) CBM (7) slag (2) Fe object (1) |
| 2030 | Area 1 | Kiln II | Basal layer in slot 2 | |
| 2031 | Area 1 | Kiln II | Cut of pit | |
| 2032 | Area 1 | Kiln II | Fill of pit 2031 | Animal bone (23) shell (1) daub? (1) charcoal (1) Sample # 006 |
| 2033 | Area 1 | Kiln II | Upper fill of pit 2022 | |

# Appendix 8: Infilling and protection measures for the preservation of the kiln fabric *in situ*

## Introduction

Following the completion of the excavation of the kiln and consultations between the client and English Heritage, it was decided that the monument should be preserved *in situ* without compromising the house building programme. This appendix report details the measures employed to achieve this aim.

## Methodology

An archaeological watching brief was required to monitor the implementation of the agreed measures to preserve the lime kiln *in situ* (Fig. 19). A series of objectives to achieve this end were agreed between the client and English Heritage, these were:

- The kiln fire pit was to be lined with Terram 1000 non-woven geotextile, or similar membrane with permeability similar to sand – 10-3m.s-1
- A 200mm thick layer of clean sharp sand (graded to BS 7533-3, Annex D, Category IV) was to be used between the membrane and stone infill. This material was also to be used to infill the kiln flues
- An inert hardcore, Type 1 material was to be used to then backfill the entire structure

## Results

The programme of works detailed above was carried out between the 28th September and the 1st October 2009. The infilling of the kiln was executed by the Strategic Team Group under the supervision of a qualified archaeologist supplied by Archaeological Services WYAS. The process was recorded photographically; see Plates 23-29 below.

Following the completion of the backfilling, the area was top-dressed with the stockpiled topsoil from the excavation and then fenced off. It is intended that this area remains fenced throughout the forthcoming demolition phase.

Plate 23: The kiln post excavation, pre conservation

Plate 24: The kiln with the Terram lining in place

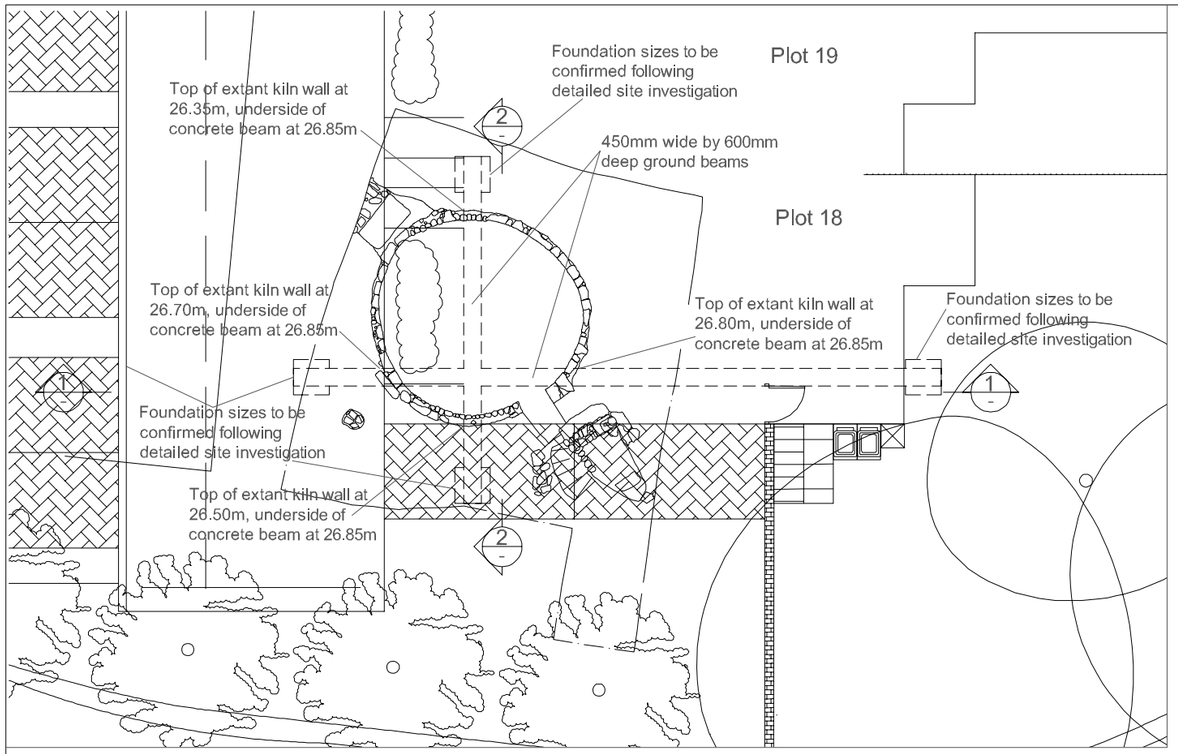
Plate 25: Backfilling the north-western flue with clean sharp sand

Plate 26: The kiln with a lower, outer layer of clean sharp sand followed by Type 1 hardcore

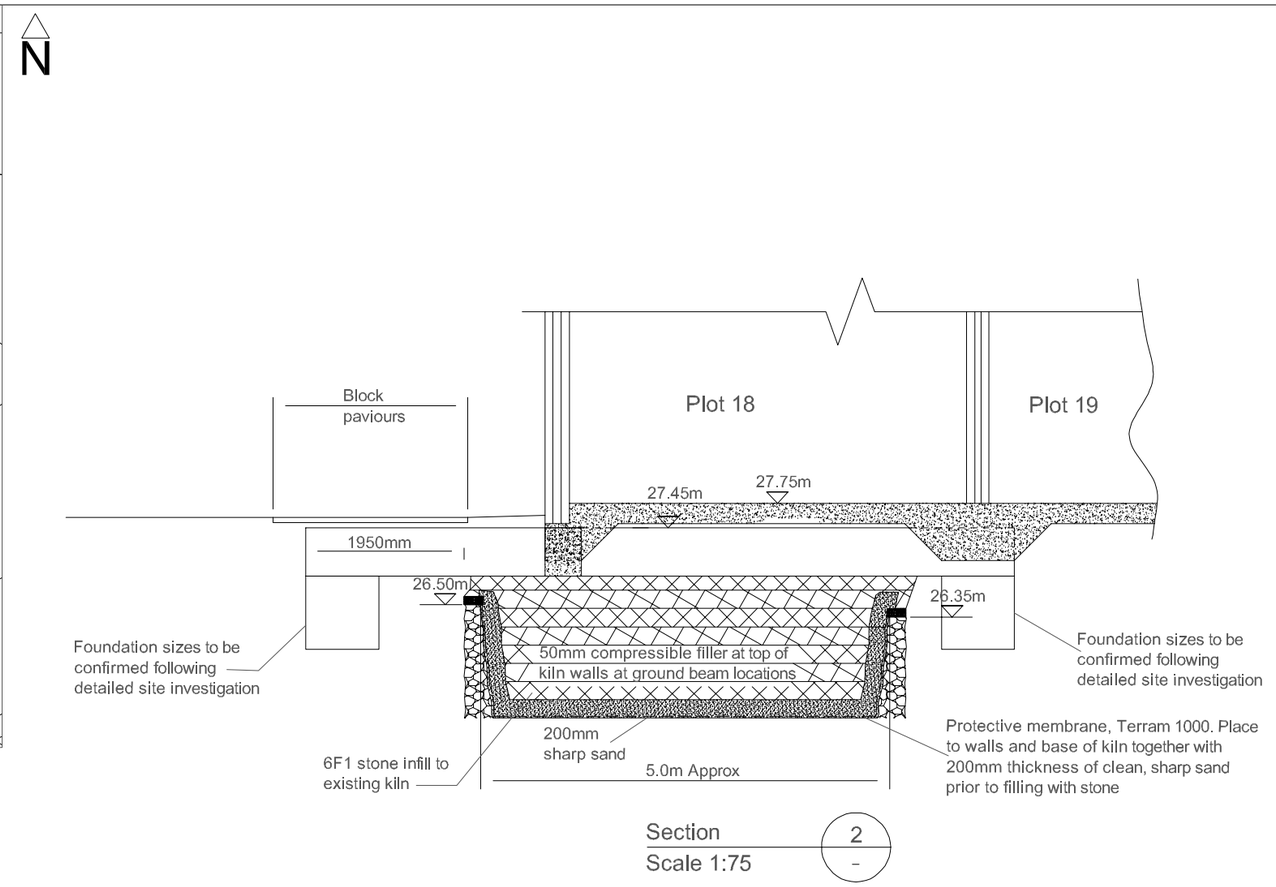
Plate 27: The Type 1 hardcore was regularly compacted with a single direction vibrating plate

Plate 28: The final capping layer of Type 1 hardcore

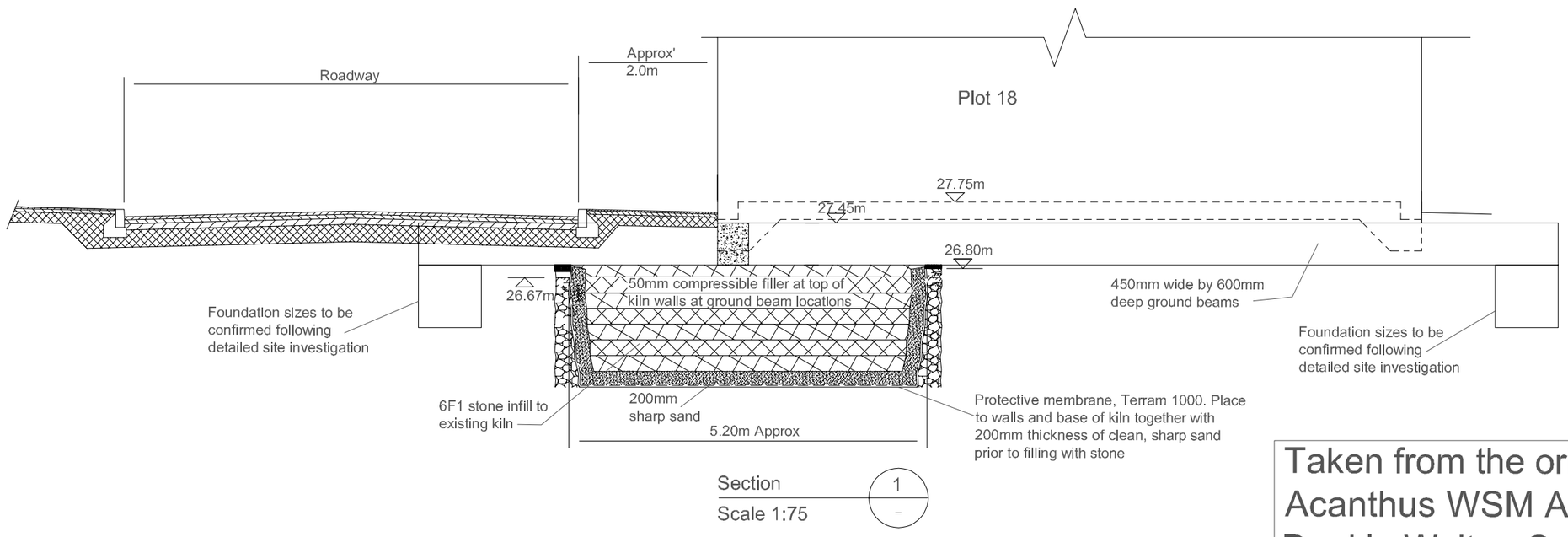

Plate 29: Stockpiled topsoil being spread over the Type 1 hardcore capping




Site plan
Scale 1:150




Section 2 / Scale 1:75




Section 1 / Scale 1:75

Taken from the original drawing by Acanthus WSM Architects on behalf of Deakin Walton Consulting Engineers.

*Fig. 19: Proposed mitigation measures (Scales: Plan 1:150, Sections 1:75 @ A3)*

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