

**STOKE BARDOLPH 400/132KV ELECTRICITY
SUBSTATION,
NOTTINGHAMSHIRE**

Archaeological Monitoring and Recording

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NON-TECHNICAL SUMMARY

A scheme of archaeological recording and monitoring was undertaken by Network Archaeology Ltd during the construction of an electricity substation close to Stoke Bardolph, Nottinghamshire. Topsoil and subsoil was removed from a series of areas, covering, in total, approximately 3ha. Few remains were encountered; the assemblage comprises two probable prehistoric pits, several struck flints, and a small number of potsherds dating from the prehistoric to the early modern period. A post-glacial palaeochannel, part of a terrace of river gravel, and a probable buried land surface were also recorded.

Considering the abundance of cropmark features in surrounding fields, the paucity of archaeological remains was surprising. This disparity is thought to be because the development site being lower and possibly less well drained in the past, may not have been as suited to settlement and enclosure as neighbouring areas. In addition, evidence of ground disturbance and plough truncation was recorded during the monitoring, which is likely to have adversely affected the preservation of any features that had originally been present.

Due to the absence of any significant visible archaeology, the level of direct impact from the monitored development on the known archaeological resource appears to have been negligible.

1 INTRODUCTION

1.1 Purpose of the report

This report presents the results of a scheme of archaeological monitoring and recording conducted at the site of the proposed Stoke Bardolph 400/132kv electricity substation, Nottinghamshire (Fig. 1). This report describes and interprets the archaeological remains encountered during groundworks, and indicates how the development impacted upon them.

1.2 Commissioning bodies

This report was commissioned by Electricity Alliance Central working on behalf of National Grid Electricity Transmission plc. The archaeological contractor was Network Archaeology Ltd, and the principal groundworks contractor was Morgan Sindall Group plc.

1.3 Development area

The proposed substation site is located approximately 10km east of Nottingham and 700m to the south west of Stoke Bardolph (NGR SK 638 407) (Fig. 1). The site is located on low-lying and comparatively level fields, within the Ouse Dyke and River Trent floodplains (18-22m OD). The Ouse Dyke runs through the site and the Trent curves to the south and east of the site approximately 1km further away. To the north of the site is Severn Trent's water treatment works, and to the south is the Netherfield Lagoons local nature reserve which encompasses wetlands arising from past gravel extraction and colliery tailings lagoons. The fields have been used for sewage disposal over the past 100 years, which has led to some ground contamination.

The British Geological Survey indicates the site to be underlain by some superficial alluvium over River Terrace deposits of Holme Pierrepont sand and gravel (BGS 2011). The solid geology consists of sandstone, siltstones and mudstones of the Mercian Mudstone Group. Deposits of colluvium (hillwash) are also recorded in the area (Atkins 2010).

1.4 Legislation, regulations and guidance

The site falls within the boundaries of Nottinghamshire County Council and Gedling Borough Council. Planning decisions have to be made with regard to the Gedling Borough Council's Replacement Local Plan adopted July 2005 and Nottingham County Council Structure Plan adopted 1996. These documents set out the general planning and environmental criteria with which development proposals should accord, and specific areas and sites of environmental protection and development land allocation.

In consideration of the substation development, regard must be had to: Electricity Act 1989; Town and Country Planning Act 1990; Circular 14/90 Electricity Generating Stations and Overhead Lines; Electricity (Applications for Consent) Regulations 1990; Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999, as amended; and The Electricity Works (Environmental Impact Assessment) (England and Wales) Regulations 2000, as amended. Condition 20 of the consent refers to 'archaeological finds within the application site' but states that 'any minor earthworks carried out outside the application boundary that are in accordance with standard utility procedures and permitted development rights would not require archaeological investigations to be undertaken'.

Consequently, Electricity Alliance Central, commissioned Network Archaeology Ltd to produce a Written Scheme of Investigation detailing the procedures to be followed during the archaeological works accompanying the development (Network Archaeology 2011). This was approved by Ursilla Spence, Senior Archaeological Officer for Nottinghamshire County Council, and set out the methodology of subsequent fieldwork and post-excavation analysis.

1.5 Archaeological background

Much of this section is taken from the Atkins Specification document (2010). Important archaeological cropmark complexes are documented in the Nottinghamshire Historic Environment Record (HER) in the close vicinity of the substation site. Previous desk-based research and intrusive archaeological investigations indicate that much of the landscape south of Stoke Lane (which includes the substation site) has been subject to the deposition of alluvium and colluvium (Atkins 2010). Therefore there is high potential for the masking of archaeological features both within the substation site and throughout the wider area.

The HER records evidence of 17 undated cropmark complexes around the study area which could represent the buried remains of prehistoric to Roman period agricultural and ritual features such as enclosures and ring ditches. Several of these cropmarks lie within or on the edge of the site boundary (Fig. 1). This rather intensive distribution of cropmarks, evident despite the likely masking of areas by alluvial or colluvial deposits, is the reason why the proposed substation site lies within an area of archaeological constraint, identified as such by Nottinghamshire County Council and deemed to have a higher than average potential for the survival of buried archaeological remains.

1.5.1 Previous work

Prior to the works that form the subject of this report, no intrusive archaeological field surveys have been undertaken within the site boundary. However, in advance of highway improvement works on the A612 east of Gedling, two programmes of trial trench evaluation and a subsequent programme of targeted excavation were undertaken. This work demonstrated that alluvial deposits are distributed quite extensively on land immediately to the west of the proposed substation site, reinforcing the assumption that such deposits are highly likely to exist within the site boundary too. The evidence of cropmarks within and around the site boundary could also indicate that this alluvium is not likely to cover the entire site or, less likely, that the cropmarks represent the remains of post-alluvial features.

Trial trench evaluation in 2004 to the west of the proposed site for the A612 improvement scheme demonstrated that alluvial deposits were, on average, approximately 0.4m to 0.5m deep, underneath the ploughsoil horizon. Evidence of palaeochannel deposits was also found, in which rather deeper organic, peaty deposits were radiocarbon-dated to the Mesolithic and Neolithic periods.

1.5.2 Prehistoric and Roman

The River Trent gravels are relatively rich in archaeological deposits. Flint scatters of Mesolithic and Neolithic date have been identified at various locations including Carlton within 2km of the proposed site. Bronze Age metalwork has been recovered in substantial quantities from riverine contexts along the Trent valley and during residential development and quarrying at Attenborough, Colwick, and Holme Pierrepont, the latter two sites lying approximately 4km south of the proposed site. Evidence for Early and Middle Bronze Age cremation cemeteries was also located at Holme Pierrepont.

Settlement on the Trent gravels became more substantial during the Late Iron Age and examples of Iron Age agricultural settlements have been found in the wider area including, again, at Holme Pierrepont. The increase in field systems and other boundary features around the Trent has been tentatively linked with population growth and the resultant intensification of agricultural output (Knight and Howard, 2004a).

The Roman fort and town of Margidunum was located approximately 7km to the east. This was established around AD 50-55 but abandoned shortly after around AD 75. The civilian settlement was established in the mid-second century and flourished until the mid-fourth.

The dispersed group of cropmarks recorded in the fields to the south of Stoke Lane and the Severn Trent Sewage Treatment Works represent different phases of activity. They are the probable remains of field boundaries, stock enclosures, track or droveways and sparse settlement remains. Morphological comparisons to local and regional examples suggest that these are likely to date to the later Iron Age and Roman periods, although there is a limited potential for earlier remains.

1.5.3 Early medieval

As elsewhere along the Trent, the local archaeological record for the early Anglo-Saxon period is dominated by funerary sites (Elliot, Jones and Howard 2004, 162). A pre-Christian Anglo-Saxon mixed cremation and inhumation cemetery is known at Holme Pierrepont approximately 3km to the south west of the substation site, on the opposite bank of the river. Just to the north, at Netherfield, six Anglian cremation urns of simple form were found sometime before 1932. Neither site enjoyed formal excavation. The settlement that was served by these cemeteries has not been identified. Gedling and Carlton both have old English place-name elements and are mentioned in the Domesday Survey, as is Stoke Bardolph.

1.5.4 Medieval

The main phase of settlement and expansion of most Nottinghamshire villages took place during the medieval period. The village of Gedling appears to have originally had two focal points, possibly combining two smaller settlements divided by the Ouse Dyke. This settlement was split in the Domesday Survey, with the division of ownership persisting until the eighteenth century enclosure awards. Moated sites and other manorial remains have been excavated at Stoke Bardolph and Burton Joyce (Elliot, Jones and Howard 2004, 175).

1.5.5 Post-medieval and modern

The parish of Gedling was fully enclosed by the late eighteenth century. By the nineteenth century, Gedling, Carlton and Colwick had been absorbed by Nottingham as the city expanded, whilst Stoke Bardolph remained a discrete, more rural settlement.

The construction of the railway and associated sidings at Colwick during the latter half of the nineteenth century was a response to the increasing industrialisation of the region, based largely on coal mining. By 1914 much of the rural area from Gedling east towards Stoke Bardolph had been developed for housing and the Colwick sidings. The sidings remained until recently, only demolished and removed at the end of the last century and replaced by the Victoria Retail Park. The Stoke Lane Sewage Works, constructed early in the twentieth century, increased in size and the resulting sludge has been spread on the surrounding fields subsequently.

1.6 Aims

The aims and objectives of the archaeological work, as set out in the Written Scheme of Investigation (Network Archaeology 2011), were:

- To fully record, analyse, interpret and report all archaeological remains within the investigation areas of interest prior to construction, and to place the results of this work in the public domain by depositing it with the Nottinghamshire Historic Environment Record;
- To determine the form and function of the archaeological remains encountered;
- To determine the spatial distribution of the archaeological remains encountered;
- To recover datable material from archaeological features and deposits where practicable;
- To establish the sequence of the archaeological remains recorded on the site.

1.6.1 Archaeological resourcing

The monitoring and recording was carried out intermittently between Monday 18th April and Tuesday 2nd August 2011, according to the requirements of the construction schedule. For most of this period, Gavin Glover was the Senior Attending Archaeologist, and was assisted as necessary by Christopher Casswell, Patrick Daniel and Matthew Gault.

Use was made of MapInfo GIS and AutoCAD to manage and present the graphical data. Artefacts have been assessed by a number of independent specialists; their reports have been included as appendices to this document.

1.7 Distribution of this report

The following will each receive a copy of this report:

- Ian Price, Project Manager, Electricity Alliance Central
- Ursilla Spence, Senior Archaeological Officer, Nottinghamshire County Council
- Nottingham City Galleries and Museums

2 FIELDWORK PROCEDURES

2.1 Quality standards

All archaeological work was undertaken in accordance with the Institute for Archaeologists' standard and guidance documents (IfA 2008a, 2008b, 2009a, 2010).

The standards represented by the Registered Organisation (RO) scheme operated by the IfA were adhered to throughout. Network Archaeology Ltd is a Registered Organisation (RO) with the IfA. Key project staff are members of the IfA at appropriate levels.

2.2 Fieldwork

The stripping of topsoil and subsoil deposits down to construction formation depth, as well as the excavation of a number of compensation ponds formed the focus of the archaeological monitoring (Fig. 1).

2.2.1 Survey

The proposed development area and any remains within it were located using a Leica 900 Differential Global Positioning Systems (DGPS) field unit running in Real-time Kinematic (RTK) mode, which was operated by Network Archaeology staff.

2.2.2 Site sub-divisions and archaeological mitigation

The site of the proposed development was subdivided into a number of areas, called Areas A-G inclusive. The construction formation level (the ground level at which excavation ceased) varied in each, according to the requirements of the substation design.

Table 2.1: Summary of investigated areas

Area	Hectares	Designation	Approx. Formation Depth Below Ground Level	Mitigation	Summary of Remains
A	1.07	Compensation area	0.9	Strip, map and record	Modern linear agricultural features, five tree throws and two heavily truncated pits

Area	Hectares	Designation	Approx. Formation Depth Below Ground Level	Mitigation	Summary of Remains
B	0.75	Compensation/wildfowl pond	1.3	Evaluation trenching	No archaeology, with modern disturbance below formation depth
C	0.15	Compensation/wildfowl pond	0.5	Evaluation trenching	No archaeology
D	0.15	Compensation area	1	Watching Brief	No archaeology
E	0.0122	Transformer pit	2.25	Watching Brief	No archaeology
F	0.0264	Interceptor	1.8	Watching Brief	No archaeology
G	0.0264	Interceptor	2.2	Watching Brief	No archaeology

In addition to the areas detailed above, archaeological monitoring was also carried out in several other locations. This was in response to ground-disturbing works associated with the construction of a number of temporary structures, such as car parks, site compounds and the footings for a bridge over the Ouse Dyke. In total, these works meant that an additional 0.7ha of land was subjected to archaeological monitoring, although topsoil was not fully removed from all of the temporary structures.

Archaeological mitigation commenced with a strip, map and record programme within Area A (Fig. 2). Overburden was removed using a 360-degree tracked mechanical excavator fitted with a toothless ditching bucket. This occurred in two stages: firstly, the topsoil was removed; secondly, subsoil was removed in spits to formation level. All soil stripping was carried out under direct archaeological supervision. Remains were planned and excavated as appropriate, according to the terms of the WSI (Network Archaeology 2011).

Results from Area A were then used to inform the level of mitigation required for subsequent Areas. In each, overburden was removed using a 360-degree tracked mechanical excavator fitted with a toothless ditching bucket.

2.2.3 Hand-excavation, recording and sampling

Exposed remains were planned and then investigated by hand-excavation. Representative sections were drawn to record the stratigraphic sequence. A full written, drawn and photographic record was made of the site, including standardised context descriptions on *pro forma* record sheets. Sections were drawn at a scale of 1:20, and a digital plan was produced of each of the Areas to locate prominent remains and the representative sections. Photographs were taken in colour transparency, monochrome and digital formats.

2.3 Project codes and number allocations

The scheme of works has been given the internal Network Archaeology project code SBN 16. In addition, a museum accession number (NCMG:2011-30) has been issued by Nottingham City Museum and Galleries, the proposed body for the deposition of the site archive for this project. All documents relating to the site archive have been referenced, where appropriate, with these two codes.

As standard, unique context numbers were used in the recording of the stratigraphic units encountered during the project.

2.4 Post-excavation reporting

Following completion of the fieldwork, the finds were quantified and sent to appropriate specialists for reporting; these specialists are listed in the table below.

Table 2.2 Material types and specialists

Material type	Assessment by
Flint	Hugo Anderson-Whymark
Roman Pottery	Ruth Leary
Post-Roman Pottery	Paul Courtney
Fuel-ash Slag	Rod Mackenzie
Bulk Soil Samples	Val Fryer

2.5 Data management and presentation

2.5.1 Context data

Summary context data, giving a full description and brief interpretation of each context, is presented in Appendix A.

2.5.2 Accuracy of displayed data

Survey data was captured in two ways: within Area A and D-G, a Leica 900 DGPS field unit, typically capable of capturing data with an accuracy of +/- 10-20mm. Within Areas B and C, the limits of the compensation ponds were set out by the site engineer using a DGPS fieldset, and the locations of the evaluation trenches in these areas were then established in reference to a 1:500 base plan provided by the developer, and the use of a handheld GPS unit. These units typically are typically accurate to $\pm 5m$.

3 RESULTS

The results from each of Areas A-G are described below.

3.1 Area A (Fig. 2)

Area A was the largest of the monitored areas, covering a little over 1ha (plates 1 and 2). Prior to the commencement of groundworks, it was felt that this area had the highest potential for the survival of archaeological remains, because of the cropmark features recorded in the field immediately to the west (Fig. 1).

The stratigraphically earliest deposit was context *128*, an expanse of gravel located in the south west corner of Area A (Plate 6). This deposit comprised mid-brown gravel with frequent patches of coarse sand, and is likely to represent the remains of a terrace of fluvially deposited river gravels. Outcrops of gravel were also recorded at two other locations within Area A.

The courses of a former water channel ran across Area A on a roughly north to south orientation, and had been filled with a mix of mid-brownish orange and yellow sands. The sands, which may be both fluvio-glacial and aeolian in origin, are assumed to have accumulated shortly after the last glaciation (Rackham, this report). The palaeochannel appeared to have cut the gravel deposits around it, including *128*.

Two areas of mid-brown silty sand, *122* and *144*, were recorded in the southern part of Area A, sealed beneath the subsoil. Context *122*, the larger of these, measured at least 55m in length by 33m wide and was around 0.35m thick. It overlay *103*, the fill of the palaeochannel. It is thought that *122* and *144* are part of the same overall deposit, and may represent the remains of a former ploughsoil or land surface. Inclusions of charcoal and the presence of a range of artefacts, including Neolithic or Early Bronze Age struck flint, and pottery dating from the pre-Roman Iron Age and Roman periods suggest that it stood exposed to human activity in the past, and possibly for a prolonged period.

The possible former land surface had been cut by three features; two of these proved to be artefactually sterile and probably natural in origin, but one, pit **139**, was found to contain seven unabraded pieces of struck flint, of probable Neolithic to early Bronze Age date. Four fragments of fired clay, possibly representing prehistoric pot sherds, along with frequent charcoal flecks and charred hazel nutshell, were also present in this feature. Pit **139** had probably been heavily truncated: although it measured some 0.7m in diameter, it was only 0.03m deep (Plate 5).

Pit **137** (Fig 2; Fig 4a; Plate 4) was located some 90m to the north east of pit **139**, and had been dug into the fill of the palaeochannel. It measured up to 0.76m in diameter, and 0.30m deep. It had a clay lining, which had been discoloured by heat, and contained approximately 100 pebbles and cobbles, many of which were fire-cracked. Pit **137** had presumably been used to heat water. Although no dating evidence was recovered, the use of hot-stone technology suggests the feature is of some antiquity, and it is possible that pits **137** and **139** were prehistoric in date and broadly contemporary.

A number of other features were present in Area A; these include four undated and artefactually sterile minor cut features (**107**, **125**, **127** and **136**), two small burnt-out tree throws (**112** and **114**), a pit found to contain modern material (pit **105**), and a recently grubbed-out hedgeline (**102**). Several modern linear features were recorded cutting across Area A. These include gravel-filled land drains and a cast iron pipe, probably used for pumping sewage sludge from the nearby works onto the surrounding fields.

When archaeological monitoring began, Area A was a bare ploughed field covered by a 0.4m-thick layer of ploughsoil (*100*). A variety of artefacts was collected from this deposit, including a broken blade-like flake of Mesolithic to early Bronze Age date, an undiagnostic sherd of Roman greyware pottery, and a handful of later potsherds dating from the medieval to modern period.

No other archaeological remains were recorded in Area A.

3.2 Area B

Due to the paucity of archaeological remain present in Area A, and Areas D-G (all of which had been investigated before works commenced in Areas B and C), it was decided, in agreement with Ursilla Spence, the Senior Archaeological Officer for Nottinghamshire County Council, that Areas B and C should be subjected to trench evaluation. This was undertaken prior to the digging out of hollows within Areas B and C, which had been designed with a dual wildfowl habitat and flood compensation function.

Two archaeological evaluation trenches were excavated in Area B (Figs. 1 and 3) Each measured 8m by 8m on the surface and, in accordance with site safety policy, stepped in 0.5m horizontally for every *c.* 0.5m excavated vertically, until a base measuring 6m by 6m was achieved at 1.3-1.5m below the existing ground surface. These depths exceeded the construction formation level of the ponds to be excavated in Area B.

3.2.1 Trench 4 (Fig. 3d and 4c; Plate7)

The first trench excavated, trench 4 (trenches 1-3 had already been opened in Area C), contained a 1.3m thickness of deposits comprising topsoil overlaying disturbed subsoil overlaying redeposited sand, gravel and cobbles. These deposits were known to be redeposited, as the basal deposit in trench 4, context *403*, consisted of extremely compact dark greenish grey silty sand containing much modern material, including concrete, timber, brick, roofing slates and floor tile. Limited investigation using the mechanical excavator revealed this deposit to be more than 0.3m thick. This material had presumably been used to infill an excavated area of unknown extent, as no edge to *403* could be seen. The presence of this clearly man-made and modern layer at 1.3m below the existing surface signals significant local ground disturbance in the recent past, possibly linked with opportunistic sand or gravel quarrying. The extremely level and compact nature of *403* suggests that it had been flattened with a steamroller or similar prior to re-instatement.

3.2.2 Trench 5 (Fig 3e; Plate 8)

The second trench in Area B, trench 5, also contained modern material at its base. The soil matrix did, however, differ from that in trench 4, consisting as it did of orangish brown, loose, coarse sand, with the modern material comprising only a few fragments of brick and ceramic water pipe. This material was in contrast to the dark and solid deposit of 403 in trench 4, within which modern debris was more profuse. The subsequent infilling also appeared to differ, as a slightly more complex sequence of alternating layers of sand, clay and gravel was recorded in trench 5. The differences between the sequence of deposits recorded in trenches 4 and 5 may suggest that Area B has been subjected to multiple episodes of disturbance in the recent past.

3.3 Area C

3.3.1 Trench 1 (Fig. 3a and 4b)

Trench 1 was the first trench excavated in Area C. It measured 8m by 3m and was dug to a depth of 0.5m below the current ground surface, which matched the depth of the proposed wildfowl pond/flood compensation area. Modern topsoil accounted for the bulk of material removed from trench 1. This sealed a thin layer of dirty yellow sand, 161, which in turn overlay a deposit of dark brownish grey friable clayish silt, 162, which was found to contain modern bricks. This material covered the base of most of the trench, but in places could be seen to overlie 163, a deposit of yellow sand. No archaeological finds or features were present in trench 1; instead, the presence of modern brick in layer 163 hint that the area it occupied may have been subject to the same sort of disturbance as that recorded in trenches 4 and 5.

3.3.2 Trench 2 (Fig. 2b)

Trench 2 measured was 20m long by 3m wide, and was dug to a depth of 0.5m. Topsoil overlay a 0.17m-thick deposit of mid-greyish brown silty sand (201), a subsoil deposit containing occasional fragments of brick and concrete. This in turn overlay layer 202, pale yellowish brown sand, from which no finds were recovered. This deposit was at least 0.08m thick; no further deposits, or any archaeological finds or features, were present within trench 2.

3.3.3 Trench 3 (Fig. 3c)

Trench 3 measured 10m in length by 3m in width, and was 0.6m deep. In this trench, topsoil overlay pale brownish yellow sand, a subsoil deposit containing frequent patches, some up to a few metres in extent, of stiff dark grey silty clay. Modern wood and brick was recovered, but no archaeological finds or features were present.

3.4 Area D

Groundworks in Area D reduced the ground level by around 1m, in order to create a flood compensation area (Fig. 1). Archaeological monitoring recorded only a sequence of sterile or natural deposits, comprising topsoil, then a thin orange silty sand subsoil, which overlay natural alluvial clay and sand, with a deposit of fluvial sandy gravel present throughout the base of Area D. No archaeological finds or features were present.

3.5 Area E-G

Areas E to G were excavated to create pits designed to contain machinery and fittings required in the proposed substation (Fig. 1). As such, they did not occupy a particularly large area, typically less than 300 square metres, although the depths to which they were excavated did require their sides to be battered back at a 45-degree angle, in line with site safety requirements, which prevented the production of formal, vertical section drawings (Plate 9).

Archaeological monitoring recorded no finds or features within any of the areas. Instead, a similar sequence of deposits was encountered in each excavation. This comprised banded alluvial sands, generally orange or grey in colour, which sealed brown sandy river terrace gravel. This was encountered at a depth of around 1.7m to 2m below the existing ground surface.

3.6 Additional Areas

Within the southern part of the development area, archaeological monitoring was carried out on topsoiling associated with the construction of various temporary works, such as site compounds, a crane base, car parking, and a bridge footing. Nothing of archaeological note was recorded in the 0.7ha of land affected by these groundworks; the only deposit meriting mention was 155, a firm mid-grey clay found overlying the subsoil. This is thought to represent part of the flood prevention bank located on the north west side of the Ouse Dyke and was exposed within the footings for the temporary bridge that was constructed over that water course. Other than its stratigraphic positioning, no dating evidence was recovered to reveal the date of the construction of the bank, but it is assumed to be relatively modern.

3.7 Effectiveness of the methodology

The methodology employed to monitor the development was effective as it succeeded in establishing the presence, extent, character and date of remains on the site. Clearly, the site has been subjected to varying degrees of truncation and outright disturbance in the relatively recent past. The spatial limits of the various excavation areas provided adequate opportunity to determine, as fully as possible, the extent and function of all remains, and the depositional processes responsible for their presence and preservation. The site construction managers and groundworkers were extremely co-operative: they provided adequate forewarning of their activities, ensured that the archaeological monitoring proceeded in a safe way, and in no way hindered the application of the WSI.

Depending on weather conditions, dust from soil removal and plant movement occasionally partially obscured the stripped surface, but this was not a serious problem, and there is a high level of confidence that the results outlined above are a true reflection of what survived to be recorded.

The archaeological work was therefore successful in that it was able to mitigate the archaeological impact of the construction of the substation by establishing the limited quantity of archaeological remains present within the development area. The level of recording was proportionate. Sufficient records were made to establish the low overall significance of the archaeological remains, and that they were of only local interest. Evidence relating to landuse in the past was captured, and this is considered below.

4 INTERPRETATION

Very few archaeological remains were recorded, despite the large size of the development area and several weeks of monitoring. Some evidence of activity in the prehistoric and Roman periods was present, in the form of a few pieces of struck flint and Romano-British pottery. Two of the pits in Area A, **137** and **139**, may also reveal a human presence in the landscape in prehistory. Remnant soil horizons *122* and *124* may be remnants of the contemporary ground surface. In addition, several sherds of medieval and later pottery are seemingly the result of manuring of cultivated fields, and probably originated in neighbouring settlements. However, considering the relative abundance of cropmark features recorded nearby, this evidence is so sparse that it is the general *absence* of archaeological remains that merits further consideration.

A notable concentration of cropmarks is located in the field located immediately to the west of the development area (Fig. 1), with a pair linear features apparently extending from it towards Area A. This and the other cropmark complexes appear to be the remains of trackways, field boundaries and rectilinear and sub-circular enclosures. Such remains within the wider area are generally taken to be the product of a parcelling out of the land and an intensification of agricultural production that occurred in the late Iron Age through into the Roman period (Knight and Howard 2004a, 100-102; Knight, Howard and Leary 2004, 137). Cropmark field systems almost certainly represent an increased commitment to land management, although they may also have reflected, and influenced, broader cultural factors, such as how people perceived their relationship within the wider landscape (Fenton Thomas 2008, 266).

There are two main explanations to account for the absence of archaeological findings: that late prehistoric and Roman remains once extended into the development area, but have been erased by subsequent truncation, or secondly, that the development area never hosted the sort of activity responsible for the cropmark complexes visible in the fields to the west.

Evidence in support of the first explanation exists in the form of the clearly extensive ground disturbance recorded in Area B, and probably also present in Area C. In particular, trenches 4 and 5 revealed that modern ground disturbance extended to at least 1.3m below the existing land surface. Modern material in the basal deposits in trenches 1-3 may indicate that, had these been excavated to the same depth as trenches 4 and 5, then similar evidence of extensive modern truncation may also have been encountered.

Less dramatic evidence of damage was recorded in Area A, in the form of the generally truncated profiles of the features recorded there. For example, pit **139** — the feature that was found to contain unabraded struck flint, possible prehistoric pottery and charcoal — was only 3cm deep. Context *128*, the gravel terrace that was exposed in the southern part of Area A was in places overlain by nothing other than modern ploughsoil, revealing that it had not received much protection from subsoil deposits and would instead have been directly affected by plough damage. Outcrops of gravel were seen to rise in parts of Area A (Fig. 2) where their surface lay at approximately 19.4-19.7m AOD, whilst in Areas D-G the gravel lay at between 18.7m AOD (Area D) and 17.75m AOD (Area G). Given that raised gravel ‘islands’ would have offered the best-drained land and were therefore most suited to settlement, it may be that the truncation that context *128* suffered has also erased all traces of any early activity upon it.

The final strand of evidence in support of the truncation premise is the observation made by the senior attending archaeologist that Area A was generally very level, in contrast to the faint undulations discernible off-site to the west, where many of the cropmarks had been recorded (Gavin Glover, pers. comm.). This may be due to the substation fields having been ploughed more heavily in the past.

Evidence in support of the second explanation, that the substation area was less favoured for settlement and land division in the past, can also be found. Remnant soil horizons 122 and 144 are believed to be a buried land surface, and had any features been dug into it at a depth sufficient to survive later truncation, then they would have been recorded during the archaeological monitoring. In the event, only three features were recorded: two were artefactually sterile and probably natural in origin, whereas the third, pit 139, was a probable Neolithic or early Bronze Age feature, giving a *terminus ante quem* for the formation of the buried land surface. The absence of any other remains cutting this surface is therefore likely to reflect original circumstances.

The substation site lays very close to current course of the River Trent, with an intervening modern wetland area, the Netherfield Lagoons, located just to the south. A glacial palaeochannel was recorded within Area A, and although this may have been extinct by later prehistory, the likelihood remains that the substation site occupies land that, away from any gravel prominences, would have been poorly drained and prone to flooding in the past. The land where the cropmark complexes are located lies at around 21m, the ground surface then falls away slightly, to about 20m adjacent to the Trent, and it is this lower-lying area that the substation site occupies. Although the difference in height is not large, it may have been sufficient to significantly affect local drainage conditions. It is therefore possible that the lower lying land occupied by the development area was not suitable for the sorts of activities that generated the cropmark complexes. This wetter zone may still have had a role in the local farming regime, perhaps providing useful grazing through seasonally flooded water-meadows, or rushes, timber and wild foods, had it been occupied by carr woodland. Although such resources would have played an important part in the ancient economy, their exploitation would be hard to detect in the archaeological record.

The sequence of natural alluvial deposits recorded in Areas D-G, with no archaeological features or deposits present, may be congruent with such low-intensity landuse. The disparity in the cropmark evidence, with few features visible adjacent to the Trent in contrast to the extensive complexes visible to the west, may therefore be a reflection of ancient landuse that in itself was determined by past soil and drainage conditions. Certainly, following the close monitoring of soil removal from nearly 3ha of land within the substation site, it does not appear that the disparity in cropmark distribution can be explained by subsurface deposits obscuring extensive archaeological remains.

5 ASSESSMENT OF IMPACT

5.1 Importance

The area around Stoke Bardolph is known to contain remains of prehistoric, Romano-British and Anglo-Saxon activity. The concentration of cropmark remains suggests extensive exploitation of the land at the start of the first millennium AD, and the mention of Stoke Bardolph and neighbouring villages in the Domesday survey indicates the degree of settlement within the local area in the medieval period.

Any remains present in the development area may have the capacity to contribute to an appreciation and sense of local heritage, and may, if of sufficient date and quality, be able to further current research aims (Knight, Vyner and Allan 2010). Large-scale excavations at many sites close to the Trent have highlighted '*the potential of the alluvial zone for the survival of well-preserved structural and palaeoenvironmental data*' (Knight and Howard 2004a, 79). Remains within the development area may have the potential to illuminate the colonization and settlement of gravel terraces adjacent to the River Trent across a range of time periods. For example, fills from post-glacial palaeochannels may contain evidence for natural and human-influenced environmental change in early prehistory, whereas investigation of later Iron Age and Romano-British field systems may afford the opportunity to consider to how changes in land division related to agricultural intensification, and if this was linked with the new demands of the Roman occupation.

5.2 Impact

The development had the potential to have an adverse and direct impact upon any archaeological remains present on the site and lying at a depth where they would be encountered during groundworks. In addition, indirect impacts on any archaeological deposits below levels reached during groundworks may theoretically have occurred. Indirect impact can include: crushing and breaking of artefacts by the pressure and weight of any machinery present on the site; alteration in the natural water levels by installing new drainage systems and additional pressure applied to any below ground remains by the weight of new buildings being spread across the footings.

5.3 Significance of impact

Due to the absence of any significant visible archaeological remains, and the preservation by record of those few minor remains that were present, the level of direct impact from the monitored development has been negligible.

6 CONCLUSIONS

Archaeological monitoring of groundworks associated with the construction of the new Stoke Bardolph electricity substation afforded the opportunity to investigate approximately 3ha of land adjacent to a complex of cropmark features. Very few archaeological remains were recorded during the monitoring. Two factors may explain the disparity between the paucity of archaeological evidence within the substation area and the apparent profusion of remains nearby: firstly, substantial modern disturbance has occurred in places, and the part most suitable for past settlement, namely the raised gravel terrace, has been directly truncated by ploughing. Secondly, the land within the development area is slightly lower and was perhaps wetter in the past than the cropmark area. Drainage conditions may therefore have rendered it unsuitable for settlement and field enclosure, although any wetland resources may have been exploited in the past. The results of the monitoring almost certainly preclude the suggestion that the disparity in cropmark distribution may be due to subsurface deposits masking extensive archaeological remains within the substation site.

7 ARCHIVE

The documentary archive comprises:

- A copy of this report
- Relevant and non-confidential documents and correspondence relating to the site held by Network Archaeology
- Finds catalogues and reports
- Site records, as detailed in the table below:

Table 7.1 Quantification of the site archive

Item	Count
Context registers	3
Context sheets	78
Drawing registers	1
Drawing sheets	7
Photographic registers	2
Black and white photographs	67
Colour slide photographs	67
Digital images	229

On completion of the reporting stages of the project, the archive will be prepared for long-term storage in a format agreed in advance with the relevant local depository. This will be in accordance with guidelines prepared by the UK Institute of Conservation (Walker 1990), the Museums & Galleries Commission (MGC 1992) and the IfA (2008b and 2009b). The project archive will be managed in accordance with current guidelines (Brown 2007).

The recipient museum is Nottingham City Museums and Galleries, who have assigned this project the accession code NCMG:2011-30.

The recipient museum will receive the document archive, and with the permission of the landowners, the artefacts collected during the archaeological works. It has been agreed with Nottingham City Museums and Galleries that the archive will be deposited with Nottingham City Museums and Galleries at a yet-to-be-agreed date following the issue of the final version of this report.

Prior to the deposition of the archive, the necessary arrangements will be made with the site owners regarding the transfer of ownership of any archaeological finds to the recipient museums. In the event that deposition of the archive cannot be concluded, Network Archaeology will store the archive to a suitable standard until deposition can be arranged. In this event, Network Archaeology will retain ownership of the document archive until the document archive and its ownership is passed to the recipient museums.

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APPENDIX A: CONTEXT SUMMARY

Context	Area/Trench	Type	Dimensions	Description	Interpretation
100	Area A	Layer	0.4m thick (average)	Dark brown silty sand with occasional small stones. Finds included pottery and flints	Topsoil
101	Area A	Fill	0.08m thick	Mid brown silty sand with occasional charcoal flecks and small stones	Fill of hedgeline ditch (102)
102	Area A	Cut	0.92m deep and 0.08m wide	Hedgeline	Continuation of hedgeline to the north west of the site. The Ditch is probably the result of the hedge removal
103	Area A	Layer		Sand deposit	Appears to be filling an approx north-south channel. Possible periglacial
104	Area A	Fill		Fill of pit (105)	Fill of pit (105)
105	Area A	Cut	0.56m wide, 0.18m deep	Circular cut	Cut of pit
106	Area A	Fill		Fill of large pit (107)	Fill of large pit (107)
107	Area A	Cut	2.06m wide, 0.54 deep	Oval cut, steep sided with a flat base	Cut of large pit. No evidence to suggest date or function

Context	Area/Trench	Type	Dimensions	Description	Interpretation
108	Area A	Unstrat finds		Unstrat finds from northern third of Area A	
109	Area A	Unstrat finds		Unstrat finds from central half of Area A	
110	Area A	Unstrat finds		Unstrat finds from southern half of Area A	
111	Area A	Fill	0.12m thick	Fill of (112). Dark brown silty sand with frequent lumps of charcoal	Fill of pit/probably burnt root ball (112)
112	Area A	Cut	0.86m x 0.56m, 0.12m deep	Irregular sides and base	Burnt out root ball
113	Area A	Fill	0.11m thick	Dark brown silty sand with frequent lumps of charcoal	Burnt out root ball, fill of (114)
114	Area A	Cut	0.88m x 0.64m, 0.11m deep	Irregular sides and base	Burnt out root ball
115	Area G	Layer	0.4m thick	Dark brown soft sandy silt	Topsoil, plough soil
116	Area G	Layer	0.14m thick	Mid-greyish orange sandy silt	Subsoil
117	Area G	Layer	0.69m thick	Natural sandy layer	Alluvium

Context	Area/Trench	Type	Dimensions	Description	Interpretation
118	Area G	Layer	0.34m thick	Natural clayey layer with manganese inclusions	Alluvial sand
119	Area G	Layer	0.13m thick	Mid orange sand based gravel	Gravel deposit
120	Area G	Layer	0.25m thick	Brownish orange sand	Alluvial sand
121	Area G	Layer	0.22m thick	Mid orange sand based gravel	Gravel deposit
122	Area A	Layer	0.35m thick	Mid to light brown silty sand with occasional charcoal flecks. Pottery was found in this layer	Possible remnant of soil layer
123	Area A	Fill	1.92m long, 0.22m deep	Firm grey brown sand	Upper fill of pit (125), possibly filled by natural alluvial event
124	Area A	Fill	1.8m wide, 0.22m deep	Firm grey brown sand	Primary fill of pit (125), possibly filled by natural alluvial event
125	Area A	Cut	1.92m wide, 0.44m deep	Irregular oval orientated east west with a smooth shallow slope and a flat base	Pit with no evidence to suggest date or function
126	Area A	Fill	0.4m thick	Mid to dark grey silty sand	Sterile fill of irregular pit or possible tree throw (127)

Context	Area/Trench	Type	Dimensions	Description	Interpretation
127	Area A	Cut	2.55m x 1.07m, 0.4m deep	Irregular elongated cut orientate NE-SW, with irregular sides and base	Irregular pit/tree throw
128	Area A	Layer	57.83m x 26.53m as seen	Mid brown gravel	Gravel 'stand' south end of Area A
129	Area E	Layer	0.41m thick	Mid dark brown sandy silt	Topsoil
130	Area E	Layer	0.07m thick	Light grey, orange brown silt	Subsoil
131	Area E	Layer	0.57m thick	Light greyish orange sand	Natural sands
132	Area E	Layer		Sand with banding Area E	
133	Area E	Layer	at least 0.25m thick	Mid dark brown orange gravel	Natural gravel
134	Area A	Fill	1.13m wide, 0.16m deep	Light greyish range firm slightly silty sand	Upper fill of pit (136). Possibly natural alluvial deposit as very similar to layer sealing it
135	Area A	Fill	0.95m wide, 0.12m deep	Mid orange brown sandy silt	Primary fill of pit (136). Synthetic fill as it is different soil matrix to anything nearby

Context	Area/Trench	Type	Dimensions	Description	Interpretation
136	Area A	Cut	1.13m wide, 0.28m deep	Oval shaped pit orientated NNW-SSE with steep sides and a concave base	Cut of small pit with no evidence to suggest date or function
137	Area A	Cut	0.77m wide, 0.3m deep	Cut of oval feature which is orientated NE-SW. It has steep sides and a concave base	Cut of stone filled pit possibly used to heat water
138	Area A	Fill	0.03m thick	Dark grey brown silty sand containing flint and pot	Fill of pit (139)
139	Area A	Cut	0.76m x 0.70m, 0.03m thick	Sub circular feature with gradual sides and a flat base	Pit, probably heavily truncated so only the base remains
140	Area F	Layer	0.85m thick	Dark brown silty sand with occasional small stones	Topsoil
141	Area F	Layer	0.35m thick	Mid to light brown silty sand	Sand
142	Area F	Layer	1.08m thick	light brown and orange brown laminated sand and sandy clay with coarse orange sand in varying thickness at base	Laminated sands
143	Area F	Layer	0.53m thick	Mid orange brown gravel	Gravel
144	Area A	Layer	up to 0.15m thick	Mid brown silty sand	Permanent soil layer possibly a continuation of (122).It is cut by pit (139)

Context	Area/Trench	Type	Dimensions	Description	Interpretation
145	Area A	Fill		Primary lining of stone filled pit [137]	
146	Area A	Fill	0.77m wide, 0.03m deep	Grey yellow silty sandy clay	Secondary clay lining of stone filled pit [137]. Clay lining also possibly used to waterproof
147	Area A	Fill	0.75m wide, 0.07m deep	Mid grey brown sandy silt with occasional rounded fire cracked stone	Fill of stone filled pit [137]
148	Area A	Fill	0.65m wide, 0.23m deep	Heat affected stone from 7mm to 250mm. Approx 100 stones	Stone fill of pit [137]
149	Area D	Layer	0.32m deep	Mid dark grey brown sandy silt	Topsoil
150	Area D	Layer	0.11m deep	Light grey orange silty sand	Subsoil
151	Area D	Layer	n/a	Brown sand based gravel	Natural gravel
152	Area D	Layer	0.26m deep	Light slightly greyish orange silty sand	Natural sand
153	Area D	Layer	n/a	Light orange sandy clay	Natural clay
154	Northern bridge	Layer	n/a	Dark brown silty sand	Topsoil

Context	Area/Trench	Type	Dimensions	Description	Interpretation
	abutment				
155	Northern bridge abutment	Layer	n/a	Mid grey, firm clay	Flood bank deposit
156	Northern bridge abutment	Layer	Unexcavated	Mid orange sand	Natural sand
157	Northern bridge abutment	Layer		Natural northern bridge abutment	
158	VOID	VOID	VOID	VOID	VOID
159	VOID	VOID	VOID	VOID	VOID
160	Area C Trench 1	Layer	8m x 4m, 0.3m thick	Dark grey brown silty which is coarse and friable. Contains infrequent small gravelly stones	Topsoil
161	Area C Trench 1	Layer	2m long 0.08m thick	Muddy grey sand of a soft coarse texture	Redeposited version of (163)
162	Area C Trench	Layer	7m long, 4m wide	Dark brown grey clayish, friable silt. Modern bricks found	Subsurface deposit suggesting ground disturbance in the past

Context	Area/Trench	Type	Dimensions	Description	Interpretation
	1				
163	Area C Trench 1	Layer	4m x 4m, 0.1m thick	Mid yellow brown coarse soft sand	Fluvial deposit sand, not necessarily natural
200	Area C Trench 2	Layer	0.32m thick	Dark grey brown sandy silt. It is fine and friable with infrequent small stones. Full of roots with modern pot	Topsoil
201	Area C Trench 2	Layer	0.17m thick	Mid grey brown silty sand. It is fine and friable	Subsoil containing modern material
202	Area C Trench 2	Layer	Not ascertained, approx 0.08m	Yellow sandy subsoil	Fluvial sand probably laid down comparatively recently
300	Area C Trench 3	Layer	0.28 thick	Mid grey brown sandy silt. Fine and friable	Topsoil
301	Area C Trench 3	Layer	Full thickness not seen. At least 0.32m thick	Yellow sandy subsoil with dark grey silty inclusions. Contained modern wood	Disturbed subsoil
302	Area C Trench 3	Layer	3.5m long, 0.35m wide	Dark clay silty firm clay with occasional small stones. Contained modern brick	Disturbed ground
400	Area B Trench	Layer	8m x 8m, 0.3-0.4m	Dark grey brown sandy friable silt with roots throughout and	Topsoil

Context	Area/Trench	Type	Dimensions	Description	Interpretation
	4		thick	occasional small stones	
401	Area B Trench 4	Layer	8m x 8m, 0.1-0.15m thick	Dark brown silty with lenses of pale clay and patches of yellow sand	Redeposited material, probably originally the same as (400) but that layer has become homogenised through ploughing
402	Area B Trench 4	Layer	8m x 8m, 0.8-0.9m thick	Loose coarse sand with rounded stones which were mostly gravel pebbles but with some fist sized cobbles. Occasional CBM	Redeposited fluvial gravel
403	Area B Trench 4	Layer	6m x 6m, 0.3m thick	Dark layer with unfrogged bricks, concrete, modern tile and other modern debris	The presence of this recent, probably steam rolled layer, 1.3m below the current ground level reveals significant disturbance of the ground has occurred. Possible backfill of a sand and gravel quarry of unknown extent
500	Area B Trench 5	Layer	0.3-0.35m thick	Dark grey brown sandy friable silt with occasional small gravelly stones	Topsoil
501	Area B Trench 5	Layer	approx 0.08m thick	Yellow sand	Redeposited natural yellow sand forming a small patch of levelling material
502	Area B Trench 5	Layer	0.26m thick	Dark grey clay layer with small occasional stones and pockets of orange sand	Layer of humic sediment, former topsoil possibly used as levelling material
503	Area B Trench 5	Layer	approx 0.2m thick	Dark reddish brown silty sand with small gravelly stones frequently seen throughout	Redeposited natural fluvial gravel

Context	Area/Trench	Type	Dimensions	Description	Interpretation
504	Area B Trench 5	Layer	3.5m x 3.5m, 0.25m thick	Dark grey silty sand with patches of red orange sand. Gravelly stones frequent throughout. Black rotten organic patches throughout	Mixed layer, fairly organic rich (result of sludging of land in the past?). Forms P/o of backfill sequence of a levelled area of land
505	Area B Trench 5	Layer	6m x 6m, 0.44m thick	Orange brown sand of a loose coarse texture with gravelly stones throughout. Occasional patches of grey sand. Modern brick and ceramic water pipe fragments seen at base of Tr 5 in this deposit	Redeposited fluvial sand/gravel. Probably only recently laid down indicating much alteration of the surrounding land surface in the recent past.

APPENDIX B: Flint

By Hugo Anderson-Whymark

Excavations at Stoke Bardolph yielded 16 struck flints from five contexts. The flints comprise 13 flakes, a blade, a flake core and a fabricator (strike-a-light). Approximately half of the artefacts exhibit some edge-damage, indicating that they are residual, but the flint from pit 139 (fill 138) was in fresh condition, and may have been recovered from a contemporary context.

The flintwork is dominated by squat flakes of irregular forms, including many with areas of abraded cortex. In contrast, the blade (finds reference 110) and one flake (topsoil 100) are comparatively narrow, thin and regular, indicating that they derived from a blade-orientated industry. Dating individual flakes and small assemblages is notoriously difficult, but the two blade-orientated flints probably date from the Mesolithic or early Neolithic, while the squat flake debitage is probably Neolithic or early Bronze Age.

The only retouched tool is a rod-shaped fabricator, which would have been used as a strike-a-light against a piece of iron pyrites; this tool dates from the Neolithic or early Bronze Age.

These flints indicate an early prehistoric presence in the landscape, and the flint from pit 139 may have been recovered from a contemporary feature, but the assemblage is too limited to allow any insight into the nature of activities undertaken at this location.

No further work is recommended.

Catalogue

Context 100. GPS 6117005. Broken blade-like flake. Mid-brown flint with moderate white cortication and extensive uncorticated edge-damage. Mesolithic to early Bronze Age?

Context 108. Hard hammer flake of mid-brown flint.

Context 110. Two flakes, one blade-like flake, one broken blade and a small flake core. These flints are heavily edge-damaged with the exception of the blade with exhibits only slight edge-damage. All gravel flint. Mesolithic/Neolithic?

Context 122. One mid-brown flake and a small, but well used, rod-shaped fabricator. The fabricator has a triangular cross-section and exhibits extensive rounded use-wear on a pointed end; this tool probably dates from the Neolithic or early Bronze Age.

Context 138. Seven flakes of gravel flint, including three broken examples. The flint is in fresh condition and may be contemporary with the context it was recovered from. Probably Neolithic to early Bronze Age.

APPENDIX C: Roman Pottery

By R. S Leary

An archive catalogue was compiled for all the pottery according to the standard laid down by the Study Group for Romano-British Pottery (Darling 2004). Pottery was recorded detailing specific fabrics and forms, decorative treatment, condition, cross-joins/same vessel and was quantified by sherd count, weight and rim percentage values, giving estimated vessel equivalents. All the pottery from the site was catalogued in the archive and the stratified pottery was examined in order to date the features. Key groups are illustrated and catalogued below and unillustrated material is summarised. National fabric collection codes (Tomber and Dore 1998) are included where possible

Fabric descriptions

Colour: narrative description only

Hardness: after Peacock 1977

soft - can be scratched by finger nail

hard - can be scratched with penknife blade

very hard - cannot be scratched

Feel: tactile qualities

smooth - no irregularities

rough - irregularities can be felt

sandy - grains can be felt across the surface

leathery - smoothed surface like polished leather

soapy - smooth feel like soap

Fracture: visual texture of fresh break, after Orton 1980.

smooth - flat or slightly curved with no visible irregularities

irregular - medium, fairly widely spaced irregularities

finely irregular - small, fairly closely spaced irregularities

laminar - stepped effect

hackly - large and generally angular irregularities

Inclusions:

Type: after Peacock 1977

Frequency: indicated on a 4-point scale - abundant, moderate, sparse and rare where abundant is a break packed with an inclusion and rare is a break with only one or two of an inclusion.

Sorting: after Orton 1980

Shape: angular - convex shape, sharp corners

subangular - convex shape, rounded corners

rounded - convex shape no corners

platey - flat

Size: subvisible - only just visible at x30 and too small to measure

fine - 0.1-0.25mm

medium - 0.25-0.5mm

coarse - 0.5-1mm

very coarse - over 1mm

The Fabrics

CT: vesicular brown ware with sparse platey vesicles. Probably one of the early shell-tempered wares but too small to be certain.

GRB1: medium grey ware, sandy with irregular fracture. Moderate, medium, subangular quartz.

GT: brown ware, soapy feel with sparse medium quartz and some coarse buff and grey grog

HM: brown harsh feel with rough surfaces. Abundant inclusions include igneous rocks with gold mica. ?Granodiorite

Med: Medieval glazed wares

MLNV WH: Lower Nene Valley white ware Tomber and Dore 1998 LNV WH

NV1: white ware with black colour coat. Nene Valley Tomber and Dore 1998 LNV CC

OAB: undated orange ware with moderate quartz temper. This is not identifiably Roman.

A total of 21 ceramic fragments (215g) were submitted for analysis. Of these one sherd (from *100*) was glazed and of medieval or later date; two oxidised sherds from *110* were probably not Roman in date but later; four fragments from *138* in a light corky fabric may be prehistoric or fired clay; and handmade sherds in a coarse ware with igneous inclusions from *110* and *122* were of pre-Roman Iron Age date. A tiny scrap of brown pottery with platey

vesicles from *109* was probably originally shell tempered and belongs to a shelly ware group dating from the pre-Roman Iron Age into the early 2nd century AD. Three brown sherds with quartz and grog inclusions from *122* belong to a grog-tempered group dating from the Roman conquest period to as late as the early 2nd century. One of these had a footring and was probably handmade. This is likely to date to the very late Iron Age or conquest period.

The Roman pottery comprised undiagnostic grey ware sherds from *100* and *122*, the rim of a grey ware bead rim deep bowl from *110* of late 2nd-4th century-date, a very battered rim from a 3rd-century reeded rim mortarium from *110* from the Nene Valley potteries (Perrin 1999 fig. 77 no. M10, early 3rd or M 20 3rd century) and a very abraded Nene Valley colour coated sherd from *109* from a 3rd or 4th-century Castor box lid. The date range of the assemblage extends from the middle pre-Roman Iron Age to the 3rd century AD. The sherds from context *122* suggests a pre-Roman Iron Age to conquest period date range with some greyware sherds of Roman type. If the fragments from *138* are pottery then they are of Pre-Roman date. The unstratified material from *109* and *110* included pre-Roman Iron Age sherds, undiagnostic greyware and a mortarium rim of 3rd-century date, with two pieces that may not be Roman but later in date. A glazed sherd from topsoil *100* is medieval or later.

Little further can be implied by these sherds in terms of status and function although the Nene Valley material indicates trade with the potteries there.

Catalogue

Context	Fabric	Nos	Weight	Abrasion	Part	Form	Vessel type	Rim Dia	Rim%	Spot date	Comments
100	GRB1	1	7.1	very	undiagnostic bodysherd					RB	GPS 6117002
100	Med glazed ware	1	9.5	very	rim	rebated rim	bowl?	24	5	Med	GPS 6117001. very slight traces of yellowish green glaze on top of rim in centre visible at x30
109	NV1 Nene Valley colour coated ware	1	7.1	moderately	bodysherd	Castor box lid?	box lid			3-4	bodysherd turn sharply at wrong angle for a base so most likely to be box lid
109	CT brown sherd with sparse flat vesicles - ? Shelly ware	1	2.1	very	scrap						
109	GRB1	1	3.4	moderately	bodysherd	closed vessel	jar				
110	HM handmade quartz and igneous rocks tempered ware	1	9	very	undiagnostic bodysherd					PRIA	PRIA? Large inclusions of gold mica ? Granodiorite

Context	Fabric	Nos	Weight	Abrasion	Part	Form	Vessel type	Rim Dia	Rim%	Spot date	Comments
110	GRB1	2	24.5	very	rim and body	bead rim deep bowl	deep wide-mouthed bowl	32	4	Late 2nd-4th	
110	buff sandy ware? Not RB	1	3.8	moderately	bodysherd					RB or later	
110	OAB orange sandy ware	1	17.1	very	base	splayed uneven base				RB or later	
110	MLNV WH white mortarium, probably Lower Nene Valley	1	39.5	very	rim	curving reeded flange	mortarium	28	8	3rd	Perrin 1999 fig. 77 no. M10, early 3rd or M 20 3rd
138	corky clay	4	69.5	very	undiagnostic bodysherd					PRIA	PRIA or fired clay
122	GRB1	2	5.6	very	undiagnostic bodysherd					RB	RB
122	HM handmade quartz and igneous rocks tempered ware	1	2.8	abraded	scrap					PRIA	PRIA/ Large inclusions of gold mica ? Granodiorite

Context	Fabric	Nos	Weight	Abrasion	Part	Form	Vessel type	Rim Dia	Rim%	Spot date	Comments
122	GT brown ware with sparse quartz and some coarse grog	1	12.1	abraded	body and basal sherd	footring				Late PRIA or Conquest period	possibly handmade
122	GT brown ware with sparse quartz and some? grog	2	2.3	very	scraps					Late PRIA or Conquest period	These two tiny scraps seem similar in fabric to the base

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Darling, M J, 2004 Guidelines for the archiving of Roman pottery. *Journal of Roman Pottery Studies* **11**: 67-75

Perrin, J R, 1999 Roman Pottery from Excavations at and near to the Roman Small Town of Durobrivae, Water Newton, Cambridgeshire, 1956-58. *Journal of Roman Pottery Studies* **8**

Tomber, R, and Dore, J, 1998 *The National Roman Fabric Reference Collection. A Handbook*. MoLAS Monograph **2**. London

APPENDIX D: Post-Roman Pottery

By Paul Courtney

An assemblage amounting to twelve sherds was recovered. The sherds are unstratified and range in date from a possible Roman sherd to the 19th or 20th centuries. There is nothing in the assemblage to suggest that the sherds represent anything other than manuring scatters. The sherds were classified, where possible, according to the Nottingham City Museums fabric series (Nailor and Young 2001).

The Fabrics

NSP (fine) Nottingham splashed Ware (fine variant)

A single jug sherd with splashed glaze in a fine sandy (iron-rich) fabric, reduced with oxidised surfaces. c.AD 1100-1150.

NOTGL Light Bodied Green Glazed Ware

A single sherd from a glazed jug in a sandy light-firing fabric. Early/mid-13th- early/mid-14th century

MP Midland Purple

A single sherd from a jug in a near vitrified hard grey fabric with dark brown or purple skin on surfaces. This ware comes from a Coal Measures source probably Ticknall (Derbyshire). 15th-16th century.

OW Orange Ware

Two sherds from the same vessel with no glaze in a coarse orange fabric with dark exterior skin. The fabric is sandy with red iron mineral inclusions. This is derived from a Coal Measures clay and can be identified as low-fired variant of Midland Purple. 15th-16th century.

PMLOC1 Post-medieval Local 1

Three sherds from glazed wares with internal brown glazes in orange-red fabrics from a Coal Measures source probably Ticknall whose production dominated this region in the 16th-17th centuries. 16th- 18th century.

PMLOC2 Post-medieval Local 2

A single sherd in a red firing fabric with brown internal glaze. Fine mica in the fabric suggests a clay derived from a Triassic-derived strata which is widely found across the county. 16th-18th century.

CREAW Creamware

A single glazed creamware sherd from a hollow ware vessel. Probably c. 1740-c.1800 (although the ware continues to be produced into the 20th century)

DWW Developed Whiteware

A single sherd from a hollow ware vessel in an industrial white-firing fabric with blue transfer print of floral design. c.1820-

MISC Miscellaneous

A single very worn sherd in a soft, fine, orange-red fabric, possibly Romano-British.

Catalogue

Fabric	Sherds	Wt (g)	Form	Dec.	GPS
Context 100					
NOTLBG	1	3	Glazed jug		6117007
PMLOC1	1	13	Glazed bowl		6117006
MP	1	24	Jug	Thumbed handle stub	6117004
PMLOC1	1	29	Glazed bowl		6117003
Context 101					
PMLOC1	1	4	Int glazed bowl		
DWW	1	2	Hollow ware, (burnt)	Blue Floral transfer	
Context 104					
CREAW	1	1	?	glazed	
Context 108					
OW	2	10	?	Dark ext. skin	
NSP (fine)	1	3	Jug	glazed	

Fabric	Sherds	Wt (g)	Form	Dec.	GPS
MISC (?RB)	1	2	very worn		
Context 110					
PMLOC2	1	9	Bowl	Int. glazed	

Bibliography

Nailor, V, and Young, J, 2001 *A preliminary fabric type series of post-Roman pottery in Nottingham (5th to 16th centuries)*. Unpublished MS

APPENDIX E: Archaeometallurgical Assessment

By Rod Mackenzie

Introduction

This report is an assessment of three small fragments of slag-like residue recovered during an archaeological fieldwork at Stoke Bardolph, Nottinghamshire. The aims of the assessment have been to carry out a visual inspection of the fragments in order to identify their process origin, and determine whether more detailed analysis of the fragments could provide additional information about the site.

Results and Discussion

The three fragments weigh approximately 55g in total, and their morphology is typical of heavily weathered fuel ash slag. The archaeological context of the fragments is described as a possible remnant soil layer from the Roman period (layer 122). Apart from the presence of occasional flecks of charcoal, the context offers no clues as to the process origin of the slag. Fuel ash slag can be produced by relatively long-burning wood-, charcoal- or coal-fuelled fires, so it is possible that the slag relates to a domestic source, such as a cooking/heating hearth or bread oven.

In some cases, scientific analysis can help to determine the process origin of slag, although this is normally only justified where there is supporting archaeological or historical evidence, or where the particular slag found is of an archaeometallurgically significant type.

Conclusion

The assemblage consists of three fragments of fuel ash slag thought to date from the Roman period. At this stage, there is not enough supporting evidence to suggest a specific production source of the slag.

Recommendations

The fragments are of limited archaeological potential and, apart from noting their presence, no further work is recommended and the material can be disposed of.

APPENDIX F: The Charred Plant Macrofossils and Other Remains

By Val Fryer

Introduction and method statement

Excavations at Stoke Bardolph, undertaken by Network Archaeology, recorded a limited number of features of possible prehistoric and later date. Samples for the retrieval of the plant macrofossil assemblages were taken from the fill of possible Neolithic or early Bronze Age pit **139** (sample 1) and from the fill of a further undated pit (sample 2; pit **137**), and these were submitted for assessment.

The samples were processed by manual water flotation/washover and the flots were collected in a 300 micron mesh sieve. The dried flots were scanned under a binocular microscope at magnifications up to x 16 and the plant macrofossils and other remains noted are listed below in Table 1. Nomenclature within the table follows Stace (1997). All plant remains were charred. Modern roots, seeds and arthropod remains were also present within both assemblages.

The non-floating residues were collected in a 1mm mesh sieve and were sorted when dry. Artefacts/ecofacts were not recorded.

Results

Both assemblages are extremely small (considerably less than 0.1 litres in volume) and sparse. Charcoal/charred wood fragments, most of which are very abraded, are present within both assemblages, but the only other plant macrofossils recorded are fragments of hazel (*Corylus avellana*) nutshell from sample 1 and a single piece of indeterminate root/stem from sample 2. Other remains are also scarce, comprising a single small fragment of abraded bone and small pieces of coal.

Conclusions and recommendations for further work

In summary, as both assemblages are so small and sparse, close interpretation of the contexts from which the samples were taken is not possible. There are no indications that the primary disposal of material occurred within either feature, and it would appear most likely that the few remains which are recorded are derived from scattered or wind-dispersed refuse, which was accidentally incorporated within the pit fills.

As neither assemblage contains a sufficient density of material for quantification (i.e. 100+ specimens), no further analysis is recommended.

Table F1: Charred plant macrofossils and other remains

Sample No.	1	2
Context No.	138	147
Feature No.	139	137
<i>Corylus avellana</i> L	X	
Charcoal <2mm	XXX	X
Charcoal >2mm	XX	
Charcoal >5mm	X	
Charred root/stem	X	
Bone	X	
Small coal frags	X	
Sample volume (litres)	14	
Volume of flot (litres)	<0.1	
% flot sorted	100%	100%

Key to Table:

X = 1 – 10 specimens

XX = 11 – 50 specimens

XXX = 51 – 100 specimens

APPENDIX G: Geoarchaeological Statement

By James Rackham

At the request of Network Archaeology, Area A of the site at Stoke Bardolph was visited on 1st June 2011 to assess the deposits and potential for any further surviving archaeological deposits. The site had been stripped in spits and limited archaeological features revealed despite the proximity of a known crop mark indicative of a nearby settlement and field system. The primary question was whether the site required further stripping or the deposits reached were geological in character.

The site was walked over with the supervisor Gavin Glover. It was evident on viewing the whole site from the top of the spoil heap that the exposed stripped surface showed two sand-filled palaeochannels running down the long strip on the north-west side of the development area and across the south-east stripped area. It is possible that the channels joined up under the unstripped area. The hand auger was used to show that these channels cut the exposed clays in the south-west and the gravels along the north-west stripped areas, showing that the clays and gravels exposed on the floor of the trench were the earliest deposits.

The palaeochannel is interpreted as a late glacial channel, one of a probable number of braided channels on the floor of the late glacial river valley. The sands infilling the channel may be both fluvio-glacial and aeolian in origin.

On the basis of this field interpretation it was considered that the soil stripping had already removed all possible post-glacial blanket deposits, and only a small number of negative features remained. Further stripping would not reveal any further archaeological features.

APPENDIX H: OASIS Summary

OASIS DATA COLLECTION FORM: England

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OASIS ID: networka2-116364

Project details

Project name	Stoke Bardolph 400/132KV Electricity Substation, Notts: Archaeological Monitoring and Recording
Short description of the project	A scheme of archaeological recording and monitoring was undertaken by Network Archaeology Ltd during the construction of an electricity substation close to Stoke Bardolph, Nottinghamshire. Topsoil and subsoil was removed from a series of areas, covering, in total, approximately 3ha. Very few remains were encountered; the assemblage comprises two probable prehistoric pits, a few struck flints, and a handful of potsherds dating from the prehistoric to the early modern period. A post-glacial palaeochannel, part of a terrace of river gravel, and a probable buried land surface were also recorded. Considering the abundance of cropmark features in surrounding fields, the paucity of archaeological remains was surprising. This disparity is thought to be because the development site, on account of being lower and possibly less well drained in the past, may not have been as suited to settlement and enclosure as neighbouring areas. In addition, evidence of ground disturbance and plough truncation was recorded during the monitoring, which is likely to have adversely affected the preservation of any features that had originally been present. Due to the absence of any significant visible archaeology, the level of direct impact from the monitored development on the known archaeological resource is presumed to have been negligible.
Project dates	Start: 18-04-2011 End: 02-08-2011
Previous/future work	No / No
Any associated project reference codes	SBN 16 - Contracting Unit No.
Any associated project reference codes	NCMG:2011-30 - Museum accession ID
Type of project	Field evaluation
Site status	Local Authority Designated Archaeological Area
Current Land use	Cultivated Land 3 - Operations to a depth more than 0.25m
Monument type	PIT Late Prehistoric
Monument type	PALAEOCHANNEL Early Prehistoric
Significant Finds	LITHIC IMPLEMENT Late Prehistoric
Significant Finds	POT Roman
Significant Finds	POT Medieval
Significant Finds	POT Post Medieval
Significant Finds	SLAG Uncertain

Methods & techniques	'Test Pits','Visual Inspection'
Development type	Energy Infrastructure (construction of electricity substation)
Prompt	Electricity Act 1989 Section 36
Prompt	Direction from Local Planning Authority - PPS
Position in the planning process	After full determination (eg. As a condition)

Project location

Country	England
Site location	NOTTINGHAMSHIRE GEDLING STOKE BARDOLPH Stoke Bardolph Electricity 400/132V Substation
Postcode	NG14 5HR
Study area	3.00 Hectares
Site coordinates	SK 638 407 52.9595563873 -1.0501111090 52 57 34 N 001 03 00 W Point

Project creators

Name of Organisation	Network Archaeology Ltd
Project brief originator	Local Authority Archaeologist and/or Planning Authority/advisory body
Project design originator	Atkins
Project director/manager	Claire Lingard
Project supervisor	Gavin Glover
Type of sponsor/funding body	Electricity Authority/Company
Name of sponsor/funding body	Electricity Alliance Central

Project archives

Physical Archive recipient	Nottingham City Museums and Galleries
Physical Archive ID	NCMG:2011-30
Physical Contents	'Ceramics','Worked stone/lithics'
Digital Archive recipient	Nottingham City Museums and Galleries
Digital Archive ID	NCMG:2011-30
Digital Contents	'other'
Digital Media available	'Database','Images raster / digital photography','Spreadsheets','Survey','Text'

Paper Archive Exists?	No
Paper Archive recipient	Nottingham City Museums and Galleries
Paper Archive ID	NCMG:2011-30
Paper Media available	'Context sheet','Drawing','Map','Miscellaneous Material','Plan','Report','Survey'
Entered by	Claire Lingard (clairel@netarch.co.uk)
Entered on	23 December 2011

OASIS:

Please e-mail [English Heritage](#) for OASIS help and advice

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PLATES



Plate 1: Area A pre-excitation, camera facing north east



Plate 2: Area A following topsoiling/subsoiling, camera facing north



Plate 3: Working shot: Chris Casswell monitoring topsoiling in Area A



Plate 4: Pit 137 partially excavated (30cm scale)



Plate 5: Pit 139 partially excavated (20cm scale)



Plate 6: Area A: Gravel terrace 128 (in foreground). Camera facing south east



Plate 7: Modern deposits in base of Trench 4 (Area B)

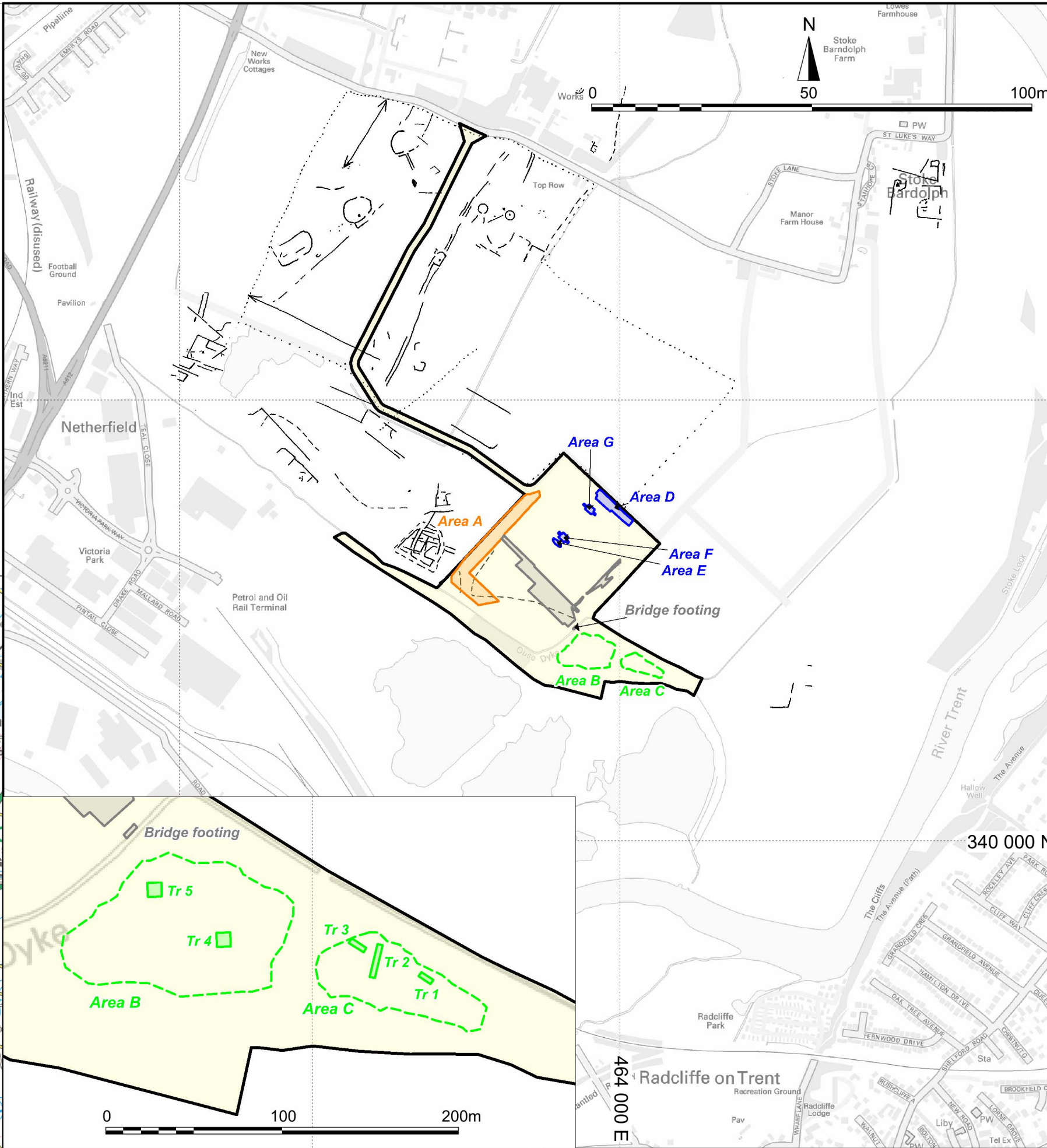
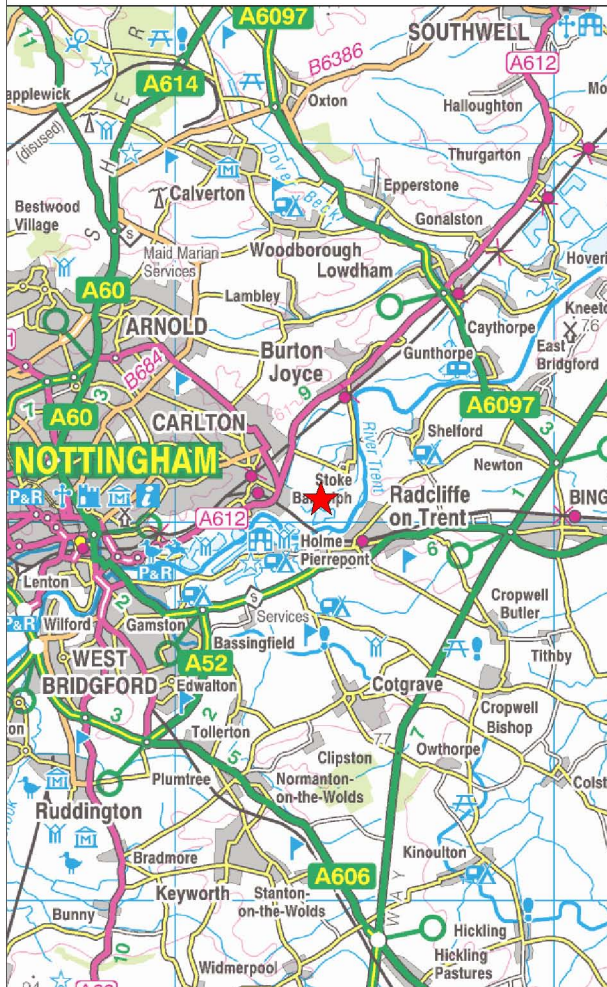


Plate 8: Trench 5, Area B following excavation



Plate 9: Area G following excavation

FIGURES



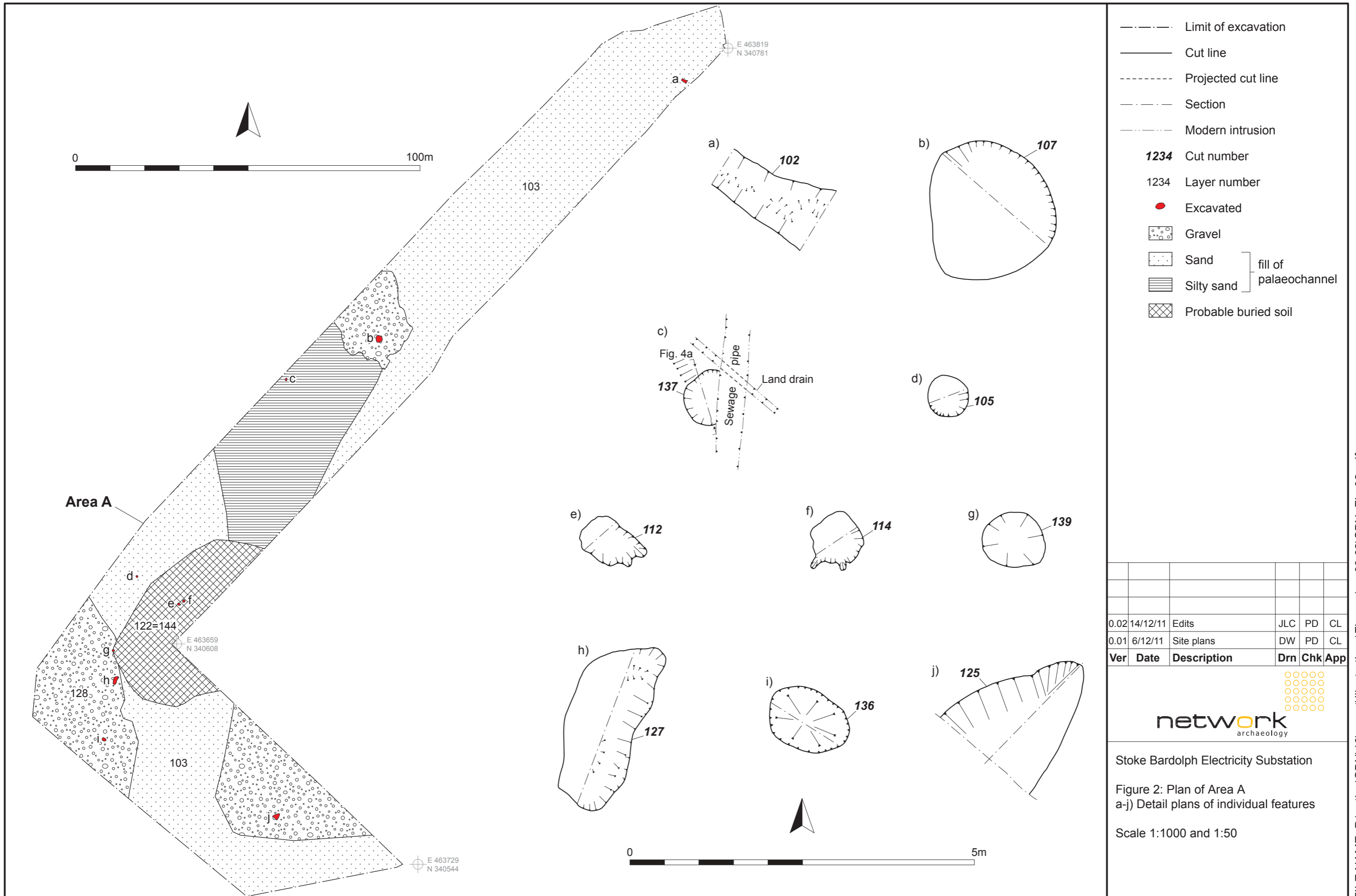
- ★ Site location
- Development area
- Strip, map and record area
- Watching brief areas
- Evaluation areas
- Evaluation trenches
- Additional areas
- ⚓ NMP Cropmarks

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Ver	Date	Description	Drn	Chk	App
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0.02	09/12/11	Edits	JLC	PD	CL



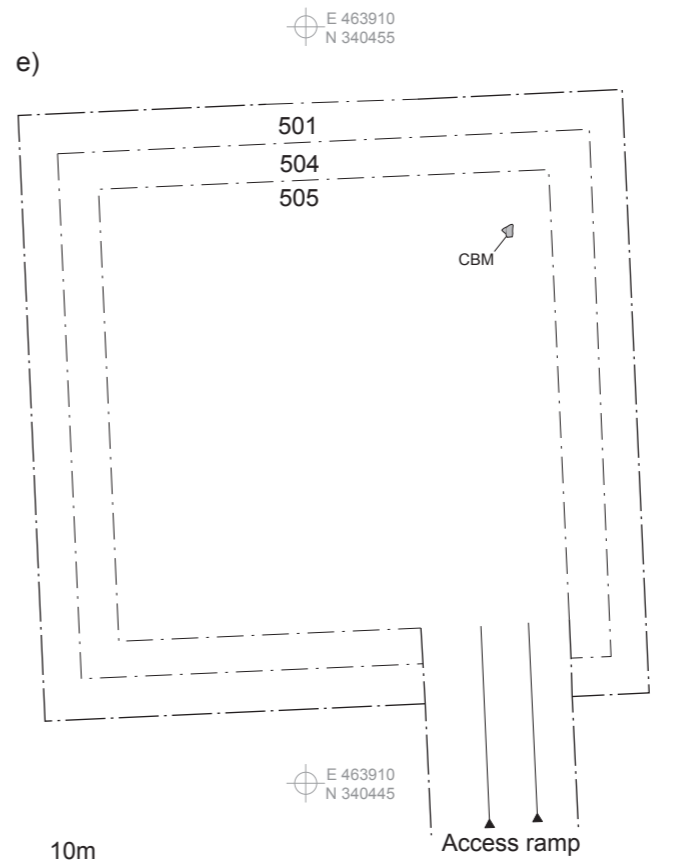
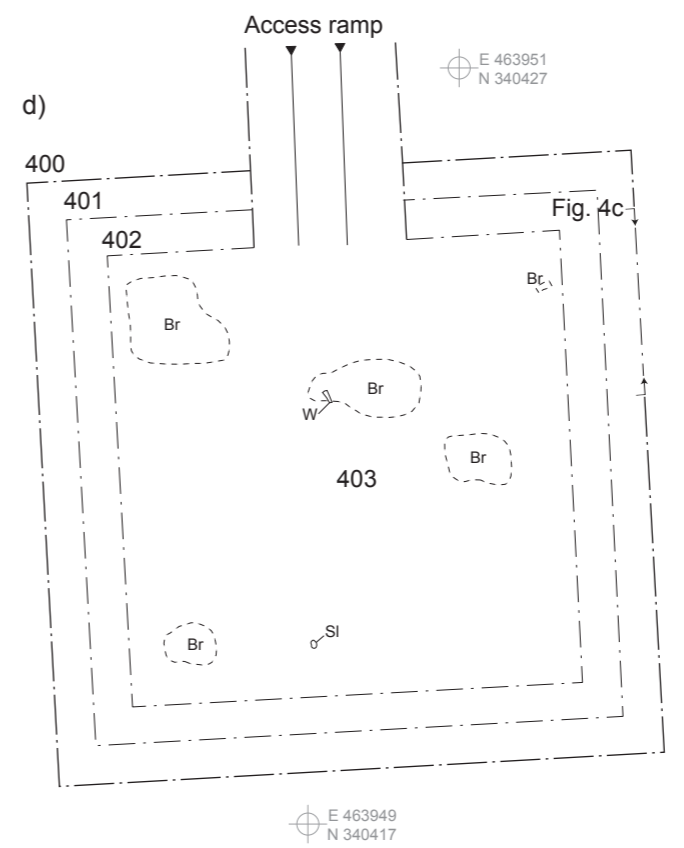
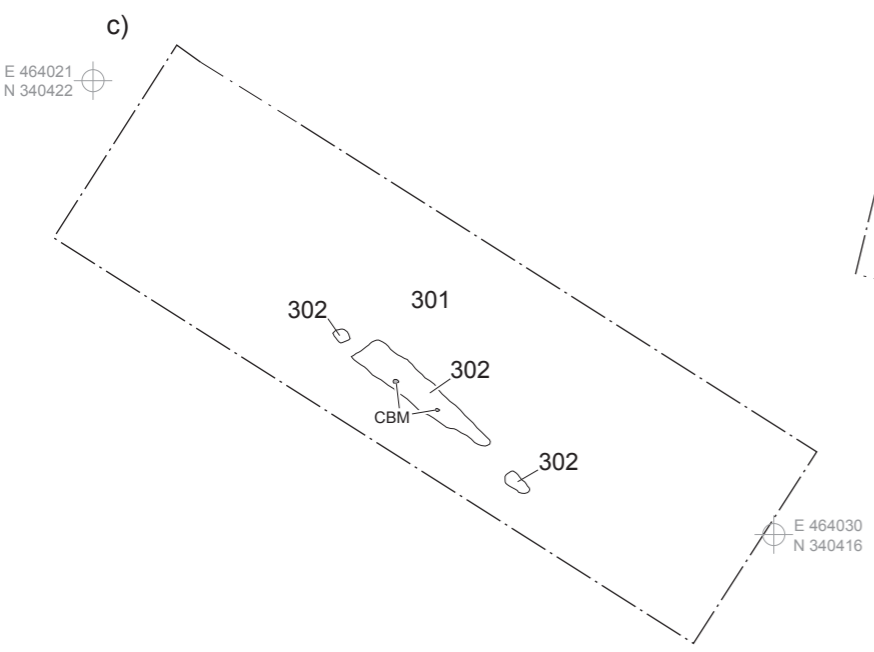
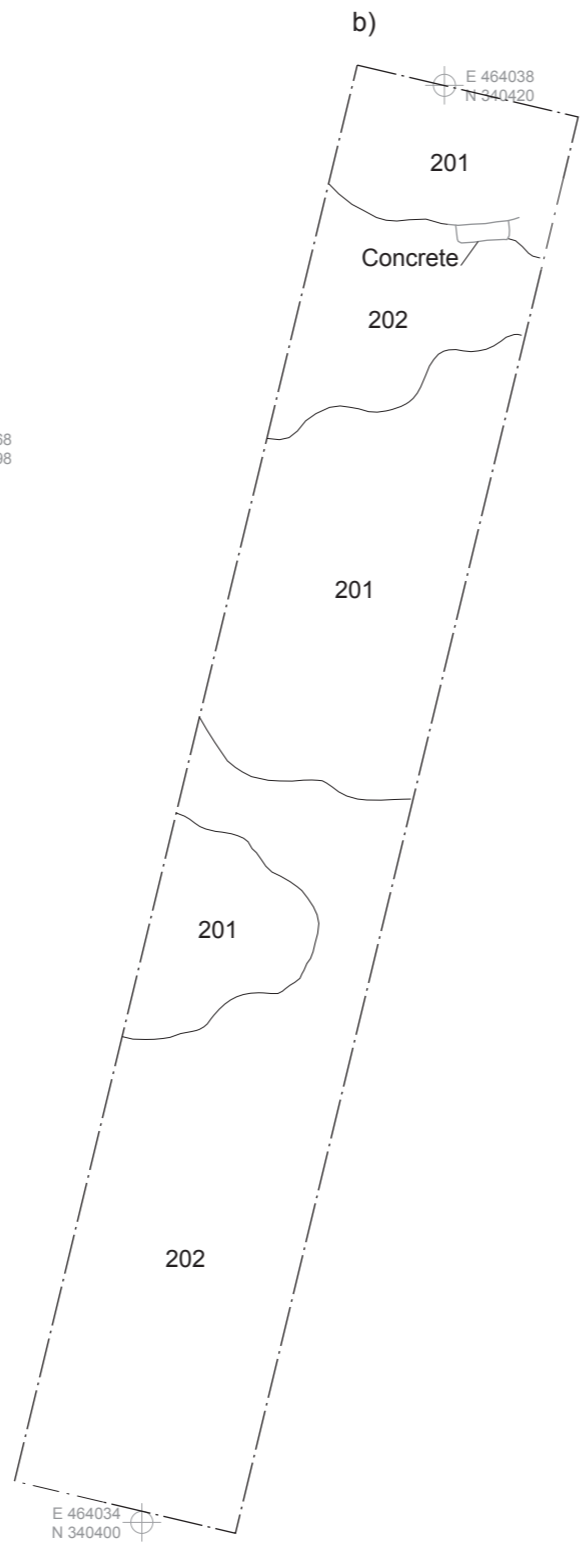
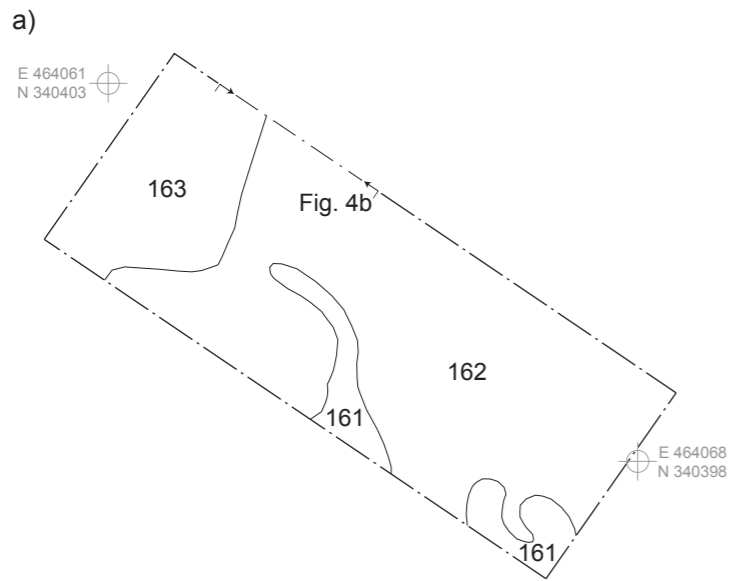
Stoke Bardolph Electricity Substation
 Figure 1
 Areas for archaeological investigation
 Scale: 1:10,000



Ver	Date	Description	Drn	Chk	App
0.02	14/12/11	Edits	JLC	PD	CL
0.01	6/12/11	Site plans	DW	PD	CL



Stoke Bardolph Electricity Substation
 Figure 2: Plan of Area A
 a-j) Detail plans of individual features
 Scale 1:1000 and 1:50



- Limit of excavation
- Feature/layer line
- - - Section/step
- - - Modern intrusion
- 1234 Deposit number
- Br Bricks and rubble
- Si Slate
- W Wood
- CBM Ceramic building material

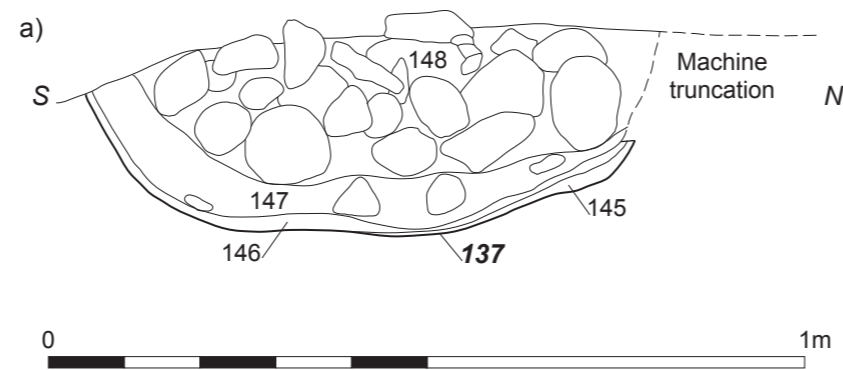
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0.01	6/12/11	Trench plans	DW	PD	CL



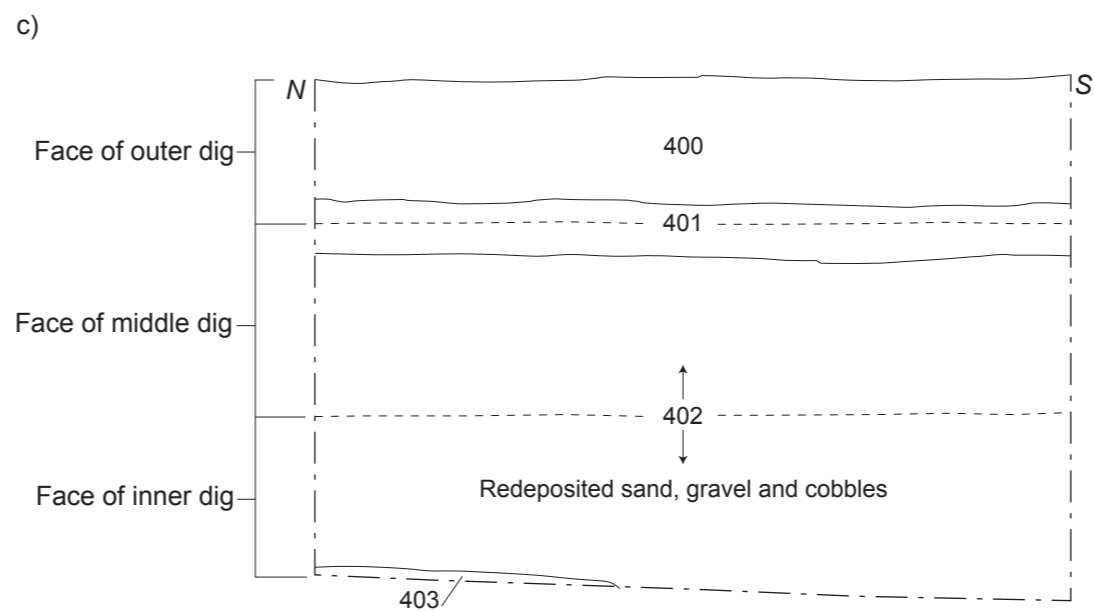
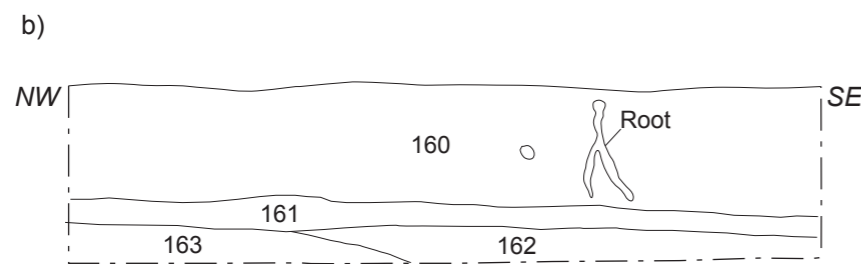
Stoke Bardolph Electricity Substation

Figure 3: Evaluation trenches
 a) Plan of Trench 1
 b) Plan of Trench 2
 c) Plan of Trench 3
 d) Plan of Trench 4
 e) Plan of Trench 5

Scale 1:100



- Cut line
- Feature/layer line
- - - - - Conjecture line
- · - · - Limit of section
- 1234** Cut number
- 1234 Deposit number



Ver	Date	Description	Drn	Chk	App
0.02	14/12/11	Edits	JLC	PD	CL
0.01	7/12/11	Sections	DW	PD	CL



Stoke Bardolph Electricity Substation

Figure 4: Sections
 a) East facing section of Pit 137
 b) South-west facing section of Trench 1
 c) West facing section of Trench 4

Scale 1:10 and 1:20