Archaeological Solutions Ltd

LAND SOUTH OF BURWELL ROAD, EXNING, SUFFOLK

AN ARCHAEOLOGICAL EVALUATION

Authors: Illustrations:	Mariusz Gorniak M.Phil (Fieldwork & report) Antony RR Mustchin MSc (Editor) Kathren Henry	
NGR: TL 613 656		Report No. 4236
District: Forest Heath		Site Code: EXG 101
Approved: Claire Halpin MIfA		Project No. P5038
Signed:		Date: 30/01/2013 Revised: 17/07/2013

Archaeological Solutions is an independent archaeological contractor providing the services which satisfy all archaeological requirements of planning applications, including:

Desk-based assessments and environmental impact assessments
Historic building recording and appraisals
Trial trench evaluations
Geophysical surveys
Archaeological monitoring and recording
Archaeological excavations
Post excavation analysis
Promotion and outreach
Specialist analysis

ARCHAEOLOGICAL SOLUTIONS LTD

98-100 Fore Street, Hertford SG14 1AB
Tel 01992 558170

Unit 6, Brunel Business Court, Eastern Way,
Bury St Edmunds IP32 7AJ
Tel 01284 765210

e-mail info@ascontracts.co.uk
www.archaeologicalsolutions.co.uk

twitter.com/ArchaeologicalS

www.facebook.com/ArchaeologicalSolutions

CONTENTS

OASIS SUMMARY SHEET

Project details			
Project name	*Land South of Burwell Road, Exning, Suffolk. An Archaeological Evaluation*		
In January 2013 Archaeological Solutions Ltd (AS) carried out an archaeological evaluation at land south of Burwell Road, Exning, Suffolk (NGR TL 613 656). It was undertaken in advance of the proposed construction of a residential development and was required to support a planning application (Forest Heath District Council Planning Ref. F/2012/0552/OUT). *To the south of the site a large scatter of prehistoric, Roman and medieval metalwork has been recorded, indicative of occupation (HER EXG 051).* *The majority of the evaluation trenches contained no archaeological features and finds, and the recorded features occurred in the north-eastern and central sectors of the site (Trenches 14, 16, 19 and 21). The majority of features contained no archaeological finds and are undated. Ditch F1009 and Gully F1015 contained a few (5 or less) sherds of 11th – 13th century pottery. The latter is abraded and may be residual, and therefore the dating of these features is not secure. Each feature also contained residual Roman pottery.* *The features are mostly linear (ditches and gullies). One undated pit (F1033 Tr. 16) and a possible pit (F1017 Tr. 19) were recorded. Interpretation of the features is uncertain as the majority are undated and isolated.* *There was a small correlation of the archaeological features with the geophysical survey data. Electromagnetic anomalies were attributed to archaeological features only in Trench 21 and possibly also in Trench 14.*			
Project dates (fieldwork)	January 2013		
Previous work (Y/N/?)	*N*	Future work	*TBC*
P. number	*5037*	Site code	*EXG 101*
Type of project	*Archaeological Evaluation*		
Site status	*None*		
Current land use	*Arable*		
Planned development	*Residential*		
Main features (+dates)	*Linears*		
Significant finds (+dates)	*A few residual Roman sherds and a few 11th – 13th sherds*		
Project location			
County/ District/ Parish	*Suffolk*	*Forest Heath*	*Burwell*
HER/ SMR for area	*Suffolk Historic Environment Record*		
Post code (if known)	-		
Area of site	*6.05ha*		
NGR	*TL 613 656*		
Height AOD (max/ min)	*Approximately 20m AOD*		
Project creators			
Brief issued by	*Suffolk County Council Archaeological Service Conservation Team (Jess Tipper)*		
Project supervisor/s (PO)	*Mariusz Gorniak*		
Funded by	*Exning Homes Ltd*		
Full title	*Land South of Burwell Road, Exning, Suffolk. An Archaeological Evaluation*		
Authors	*Mariusz Gorniak*		
Report no.	*4236*		
Date (of report)	*30/01/2013 (Revised 17/07/2013)*		

LAND SOUTH OF BURWELL ROAD, EXNING, SUFFOLK

AN ARCHAEOLOGICAL EVALUATION

SUMMARY

In January 2013 Archaeological Solutions Ltd (AS) carried out an archaeological evaluation at land south of Burwell Road, Exning, Suffolk (NGR TL 613 656). The evaluation was commissioned by Boyer Planning and was undertaken in advance of the proposed construction of a residential development. It was required to support a planning application (Forest Heath District Council Planning Ref. F/2012/0552/OUT), and based on advice from Suffolk County Council Archaeological Service Conservation Team requiring a programme of archaeological work.

To the south of the site, a large scatter of prehistoric, Roman and medieval metalwork has been recorded, indicative of occupation (HER EXG 051).

The majority of the evaluation trenches contained no archaeological features and finds, and the recorded features occurred in the north-eastern and central sectors of the site (Trenches 14, 16, 19 and 21). The majority of features contained no archaeological finds and are undated. Ditch F1009 and Gully F1015 contained a few (5 or less) sherds of 11th – 13th century pottery. The latter is abraded and may be residual, and therefore the dating of these features is not secure. Each feature also contained residual Roman pottery.

The features are mostly linear (ditches and gullies). One undated pit (F1033 Tr. 16) and a possible pit (F1017 Tr. 19) were recorded. Interpretation of the features is uncertain as the majority are undated and isolated. The linear features in Trench 21 were broadly parallel to each other. Ditches F1009 and F1011 were very close to each other and perhaps formed a double-ditch structure. Likewise Ditches F1019 and F1021. The linear features may relate to an old field boundary as they are on a similar alignment to a current field boundary extending south-east from Trench 21.

There was a small correlation of the archaeological features with the geophysical survey data. Electromagnetic anomalies were attributed to archaeological features only in Tr.21 and possibly also in Tr.14. The other geophysical survey anomalies may be attributed to uneven character of geological deposits in this area.

1 INTRODUCTION

1.1 In January 2013 Archaeological Solutions Ltd (AS) carried out an archaeological evaluation at land south of Burwell Road, Exning, Suffolk (NGR TL 613 656; Figs. 1 and 2). The evaluation was commissioned by Boyer Planning and was undertaken in advance of the proposed construction of a residential development. It was required to support a planning application (Forest Heath District Council Planning Ref. F/2012/0552/OUT), and based on advice from Suffolk County Council Archaeological Service Conservation Team requiring a programme of archaeological work.

1.2 The project was carried out in accordance with a brief issued by Suffolk County Council Archaeological Service Conservation Team (SCC AS-CT) (Jess Tipper, dated 6th December 2012), and a specification compiled by AS (dated 7th December 2012) and approved by SCC AS-CT. It followed the procedures outlined in the Institute of Field Archaeologists' *Code of Conduct, Standard and Guidance for Archaeological Field Evaluation* (revised 2008). It also adhered to the relevant sections of *Standards for Field Archaeology in the East of England* (Gurney 2003).

1.3 The principal objectives of the evaluation were:

- To establish whether any archaeological deposit exists in the area, with particular regard to any which are of sufficient importance to merit preservation *in situ.*
- To identify the date, approximate form and purpose of any archaeological deposit within **t**he application area, together with its likely extent, localised depth and quality of preservation.
- To evaluate the likely impact of past land uses, and the possible presence of masking colluvial/alluvial deposits, along with the potential for the survival of environmental evidence.
- To provide sufficient information to construct an archaeological conservation strategy dealing with preservation, the recording of archaeological deposits, working practices, timetables and orders of cost.
- Establish the potential for waterlogged organic deposits in the proposal area, their location and level and vulnerability to damage by development.

Planning Policy Context

1.4 The National Planning Policy Framework (NPPF 2012) states that those parts of the historic environment that have significance because of their historic, archaeological, architectural or artistic interest are heritage assets. The NPPF aims to deliver sustainable development by ensuring that policies and decisions that concern the historic environment recognise that heritage assets are a non-renewable resource, take account of the wider social, cultural, economic and environmental benefits of heritage conservation, and recognise that intelligently managed change may sometimes be necessary if heritage assets are to be maintained for the long term. The NPPF requires applications to describe the significance of any heritage asset, including its setting that may be affected in proportion to the asset's importance and the potential impact of the proposal.

1.5 The NPPF aims to conserve England's heritage assets in a manner appropriate to their significance, with substantial harm to designated heritage assets (i.e. listed buildings, scheduled monuments) only permitted in exceptional circumstances when the public benefit of a proposal outweighs the conservation of the asset. The effect of proposals on non-designated heritage assets must be balanced against the scale of loss and significance of the asset, but non-designated heritage assets of demonstrably equivalent significance may be considered subject to the same policies as those that are designated. The NPPF states that opportunities to capture evidence from the historic environment, to record and advance the understanding of heritage assets and to make this publicly available is a requirement of development management. This opportunity should be taken in a

manner proportionate to the significance of a heritage asset and to impact of the proposal, particularly where a heritage asset is to be lost.

2 SITE DESCRIPTION

2.1 The site lies to the south of properties fronting Burwell Road, Exning. It is an arable field of some 6.05ha.

3 TOPOGRAPHY, GEOLOGY AND SOILS

3.1 The site is situated on relatively flat land, just below the 20m AOD contour, dropping down very slightly towards the core of the village to the west. The soil comprises grey rendzinas (calcareous loam) over a solid geology consisting of Middle and Lower Cretaceous Chalk.

4 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

4.1 Evidence for prehistoric activity in the vicinity of the site primarily comprises a surface scatter of Mesolithic flint work recorded *c*.7 00m to the south of the site (HER EXG051), including a core, small blades, a uni-facially re-touched point and debitage. Neolithic flint arrowheads and debitage have also been found in the core of the village close to the stream, while two early Bronze Age graves and metalwork has been recorded *c*. 2.5km to the south-east. It has been speculated that Exning was a capital of Boudicca's Iceni tribe, but evidence for Iron Age occupation is limited to a scatter of Iron Age handmade, burnished pottery close to the north-west (HER EXG013), and an enclosure on Windmill Hill to the east of the village.

4.2 A Roman villa (HER EXG012) was discovered *c*. 2km to the north of the site in 1904, and there is substantial evidence of Roman occupation and settlement in the vicinity of the site. Fields *c*. 700m to the south were recorded to contain a plentiful surface scatter of Roman pottery, as well as a bronze bracelet and disc brooch (HER EXG051). In addition, an extensive area of Roman settlement has been recorded close to the north-west, on the northern side of Burwell road, including possible timber beam structures, pottery, CBM, quern stones, coins and animal bone (HER EXG013 & EXG078).

4.3 Exning was an important site in the Saxon period, containing the postulated site of a royal palace, and close to the major route-way of the Devil's Dyke. A Saxon Hall and pottery have been recorded in the core of the village (HER EXG052 & EXG0101), while Saxon bronze wrist clasp was recovered to the south of the site (HER EXG029). Saxo-Norman Thetford ware was also a component of a medieval pottery scatter *c*. 700m to the south of the site (HER EXG051). Medieval settlement at Exning is recorded in the Domesday Book, and an extensive scatter of medieval pottery, floor tile and metalwork in fields to the south of the site (HER EXG051) suggests that scattered occupation may have been distributed more widely than the core of the village.

5 PREVIOUS INVESTIGATIONS

5.1 A geophysical survey was undertaken prior to the evaluation (Smalley 2012), in summary:

No anomalies were identified as of 'probable' archaeological origin.

Some anomalies of 'possible' archaeological origin were identified. These include positive linear and area anomalies across the survey area, possibly pits and ditches, though possibly of natural origin. These include two large circular anomalies in the central and eastern part of the site. A large circular anomaly was also recorded in the western part of other site, which may relate to an earthwork rather than a ditch. Magnetic 'spikes' indicating ferrous objects were also recorded, most likely to be modern debris. Other anomalies included two swathes of magnetic variation, thought to be of geological/pedalogical origin, close centred linear anomalies thought to relate to modern ploughing, and linear anomalies on the north and east perimeter of the area, though to be modern vehicle tracks.

6 METHODOLOGY

6.1 Twenty nine trenches (*c*. 1167 linear metres) representing a 3.5% sample of the *c*. 6ha site, were excavated using a 360^{o} mechanical excavator fitted with a toothless ditching bucket. The trench locations were approved by Suffolk County Council, Archaeological Service Conservation Team. The individual trenches were linear in plan, measuring 40m x 1.8m. They were positioned to investigate geophysical anomalies (Figs. 4 and 5; Appendix 4) and otherwise followed a grid pattern (Fig. 2).

6.2 Undifferentiated overburden was removed under close archaeological supervision using a mechanical excavator fitted with a toothless ditching bucket. Thereafter, all further investigation was undertaken by hand. Exposed surfaces were cleaned as appropriate and examined for archaeological features and finds. Deposits were recorded using *pro forma* recording sheets, drawn to scale and photographed. Excavated spoil was checked for finds and the trenches were scanned by metal detector.

7 DESCRIPTION OF RESULTS

7.1 Individual trench descriptions are presented below:

Trench 1 (Figs. 2, 4 and 5)

0.00m = 22.85m AOD		
0.00 – 0.26m	L1000	Topsoil. Dark greyish brown, friable silty sand with humus - calcareous loam, including occasional small to small/medium sized mostly subrounded, subangular flint stone and angular pieces of chalk stone.
0.26 – 0.68m	L1029	Natural, geological – most likely periglacial deposit. Slightly orangey mid brown, firm silty sand with small amount of inclusions (mostly small-small/medium sized subangular and subrounded flint).
0.68m+	L1030	Natural layer. Cretaceous chalk with its upper part degraded due to periglacial action.

Description: Trench 1 was located across a weak anomaly recorded by geophysical survey, in the north-western corner of the investigated area. The anomaly appeared to be caused by periglacial deposit L1029, which was relatively deep in the central part of the trench. Topsoil L1000 sealed here both chalky Natural L1030 and the periglacial L1029 (the analogical stratigraphy occurs in other trial trenches).

No archaeological features or finds were present.

Trench 2 (Figs. 2, 4 and 5)

0.00m = 22.99m AOD		
0.00 – 0.37m	L1000	Topsoil. As above Tr.1.
0.37 – 0.68m	L1001	Subsoil. Mid greyish brown firm silty sand with small percentage of clay and rare inclusions – mostly small-small/medium sized subrounded flint and occasional angular pieces of chalk.
0.68m+	L1030	Chalky Natural. As above Tr.1.

Description: Topsoil L1000 sealed Subsoil L1001. The latter was very similar in composition to L1029 (Trench 1). No archaeological features or finds were present.

Trench 3 (Figs. 2, 4 and 5)

0.00m = 22.77m AOD		
0.00 – 0.28m	L1000	Topsoil. As above Tr.1.
0.28 – 0.41m	L1001	Subsoil. As above Tr.2.
0.41 – 0.66m	L1029	Periglacial layer. As above Tr.1.
0.66m+	L1030	Chalky Natural. As above Tr.1.

Description: Trench 3 exposed Topsoil L1000 and Subsoil L1001. The latter sealed periglacial deposit L1029 in the northern part of the trench and the chalky Natural L1030 in the southern part of the trench. Four natural features were examined in Trench 3.

No archaeological features or finds were present.

Trench 4 (Figs. 2, 4 and 5)

0.00m = 22.27m AOD		
0.00 – 0.30m	L1000	Topsoil. As above Tr.1.
0.28 – 0.37m	L1001	Subsoil. As above Tr.2.
0.37 – 0.75	L1029	Periglacial layer. As above Tr.1.
0.75m+	L1030	Chalky Natural. As above Tr.1.

Description: Trench 4 was located across weak positive and negative anomalies recorded by the geophysical survey including a possible circular earthwork. However the anomalies again proved to be natural layers; mostly L1029 reaching the depth of 0.75m in Trench 5. Three natural features (tree hollows and glacial deposits) were examined in Trench 4.

No archaeological features or finds were present.

Trench 5 (Figs. 2, 4 and 5)

0.00m = 22.52m AOD		
0.00 – 0.30m	L1000	Topsoil. As above Tr.1.
0.30 – 0.35m	L1001	Subsoil. As above Tr.2.
0.36 – 0.90m	L1029	Periglacial layer. As above Tr.1.
0.90m+	L1030	Natural. As above Tr.1.

Description: Trench 5 was perpendicular to Trench 4 with the objective to examine the same group of geophysical anomalies. As with Trench 4, this trench revealed only complex geological stratigraphy including L1029 which was more than half a metre thick.

No archaeological features or finds were present.

Trench 6 (Figs. 2, 4 and 5)

0.00m = 22.47m AOD		
0.00 – 0.28m	L1000	Topsoil. As above Tr.1.
0.28 – 0.72m	L1029	Periglacial layer. As above Tr.1.
0.72+	L1002	Natural layer. Firm yellowish-brown sandy deposit with occasional small sized angular small sized pieces of chalk – glacial sand.

Description: Six natural features were examined in Trench 6. No archaeological features or finds were present.

Trench 7 (Figs. 2, 4 and 5)

0.00m = 22.26m AOD		
0.00 – 0.28m	L1000	Topsoil. As above Tr.1.
0.28 – 0.43m	L1001	Subsoil. As above Tr.2.
0.43 – 0.88m	L1029	Periglacial layer. As above Tr.1.
0.88m+	L1002	Sandy Natural. As above Tr.6.

Description: Trench 7 was located across a weak geophysical anomaly. The latter was coincident with geological deposit L1029. One natural feature was examined in Trench 7. No archaeological features or finds were present.

Trench 8 (Figs. 2, 4 and 5)

0.00m = 22.29m AOD		
0.00 – 0.32m	L1000	Topsoil. As above Tr.1.
0.32 – 0.44m	L1001	Subsoil. As above Tr.2.
0.44 – 0.96m	L1029	Periglacial layer. As above Tr.1.
0.96m+	L1030	Natural. As above Tr.1.

Description: Two natural features were examined in Trench 8. No archaeological features or finds were present.

Trench 9 (Figs. 2, 4 and 5)

0.00m = 22.27m AOD		
0.00 – 0.27m	L1000	Topsoil. As above Tr.1.
0.27 – 0.46m	L1001	Subsoil. As above Tr.2.
0.46 – 0.85m	L1029	Periglacial layer. As above Tr.1.
0.85m+	L1030	Natural. As above Tr.1.

Description: Trench 9 was located across scattered magnetic debris recorded by geophysical survey. Three natural features were examined in Trench 9. No archaeological features or finds were present and thus the magnetic debris was likely the result of variations in geological strata or overburden.

Trench 10 (Figs. 2, 4 and 5)

0.00m = 22.98m AOD		
0.00 – 0.33m	L1000	Topsoil. As above Tr.1.
0.28 – 0.81m	L1029	Periglacial layer. As above Tr.1.
0.81+	L1002	Sandy Natural. As above Tr.6.

Description: Three natural features were examined in Trench 10. No archaeological features or finds were present.

Trench 11 (Figs. 2, 4 and 5)

0.00m = 22.22m AOD		
0.00 – 0.23m	L1000	Topsoil. As above Tr.1.
0.23 – 0.47m	L1001	Subsoil. As above Tr.2.
0.47 – 1.27m	L1029	Periglacial layer. As above Tr.1.
1.27m+	L1002	Sandy Natural. As above Tr.6.

Description: No archaeological features or finds were present.

Trench 12 (Figs. 2, 4 and 5)

0.00m = 22.33m AOD		
0.00 – 0.30m	L1000	Topsoil. As above Tr.1.
0.30 – 0.39m	L1001	Subsoil. As above Tr.2.
0.39 – 0.95m	L1029	Periglacial layer. As above Tr.1.
0.95m+	L1002	Sandy Natural. As above Tr.6.

Description: Trench 12 was located across scattered magnetic debris in the central-northern part of the site. No archaeological features or finds were present and thus the magnetic debris was likely the result of variations in geological strata or overburden.

Trench 13 (Figs. 2, 4, 5 and 6)

0.00m = 22.48m AOD		
0.00 – 0.25m	L1000	Topsoil. As above Tr.1.
0.25 – 0.37m	L1001	Subsoil. As above Tr.2.
0.37 – 1.05m	L1029	Periglacial layer. As above Tr.1.
1.05m+	L1002	Sandy Natural. As above Tr.6.

Description: Trench 13 revealed two natural features (possibly tree hollows: F1003 and F1025) and two possible ditches (F1005 and F1007). On balance the latter are interpreted as natural. No finds were present in the fills.

Natural feature F1003 was irregular in plan (2.3 x 1.0 x 0.25m). It had gently sloping sides and an irregular undulating, slightly concave base. Its fill, L1004, was a mid orangey-brown, firm silty sand with occasional small and small/medium sized flints. It contained no finds. L1004 was very similar geomorphologically to periglacial deposit L1029. F1003 was sealed by periglacial layer L1029.

Natural feature F1025 was irregular in plan (1.8+ x 3.05 x 0.4m). It had asymmetrical steep sides and an irregular undulating base. Its fill, L1026, was a mid orangey-brown, firm silty sand, with occasional small and small/medium sized flints. It contained no finds. F1025 was sealed by L1029.

?Ditch F1005 was linear in plan (2.6+ x 0.86 x 0.31m), orientated NW/SE. It had irregular sides and an irregular base. Its fill, L1006, was a mid orangey-brown, firm silty sand with occasional small and small/medium sized flints. It contained no finds. F1005 appeared to be sealed by L1029 and was therefore likely of natural provenance.

?Ditch F1007 was linear in plan (1.85+ x 1.05 x 0.16m), orientated E/W. It had slightly asymmetrical gently sloping sides and a concave base. Its fill, L1008, was a mid orangey-brown, firm silty sand with occasional small and small/medium sized mostly angular flints. No finds were present. Like F1003, F1007 was sealed by L1029 and therefore likely of natural provenance.

Trench 14 (Figs. 2, 4, 5 and 6)

0.00m = 22.69m AOD		
0.00 – 0.35m	L1000	Topsoil. As above Tr.1.
0.35+	L1002	Sandy Natural. As above Tr.6.

Description: Trench 14 was located across a circular anomaly recorded by geophysical survey. A possible Ditch F1013 was recorded. The feature contained no finds.

?Ditch F1013 was irregular in plan (1.85+ x 1.5 x 0.69m), orientated NE/SW. It had asymmetrical sides and an irregular flattish base. Its fill, L1014, was a mid orangey-brown, firm silty sand, with moderate amount of small and small/medium sized sub-angular flints. It contained no finds. F1013 may be part of the circular geophysical anomaly but this is uncertain.

Trench 15 (Figs. 2, 4 and 5)

0.00m = 22.02m AOD		
0.00 – 0.34m	L1000	Topsoil. As above Tr.1.
0.34 – 0.55m	L1001	Subsoil. As above Tr.2.
0.55 – 0.83m	L1029	Periglacial layer. As above Tr.1.
0.83m+	L1002	Sandy Natural. As above Tr.6.

Description: Trench 15 was located across an amorphous magnetic variation recorded by geophysical survey. No archaeological features or finds were present and thus the variation was likely the result of changes in the geological strata or overburden.

Trench 16 (Figs. 2, 4, 5 and 7)

0.00m =22.53m AOD		
0.00 – 0.37m	L1000	Topsoil. As above Tr.1.
0.34 – 0.56m	L1001	Subsoil. As above Tr.2.
0.55– 1.16m	L1029	Periglacial layer. As above Tr.1.
1.16m+	L1002	Sandy Natural. As above Tr.6.

Description: Like Trench 15, Trench 16 was located across the amorphous magnetic variation recorded by geophysical survey. Two parallel gullies (F1031 and F1035) and Pit F1033 were recorded. Gully F1031 contained post-medieval/early modern CBM. The other features contained no finds. One natural feature was also examined.

Shallow Gully F1031 was linear in plan (2.8+ x 0.45 x 0.06m), orientated E/W. It had moderately sloping sides and a flattish base. Its fill, L1032, was a mid orangey-brown, firm silty sand, with occasional, small - small/medium sized sub-rounded and rounded flints and small sized angular pieces of chalk. It contained a small fragment of post-medieval/early modern CBM (23g) and a piece of slag (40g). F1031 cut the natural (L1002) and was sealed by Subsoil L1001. Gully F1031 was parallel to Gully F1035.

Shallow Gully F1035 was linear in plan (3.2+ x 0.35 x 0.06m), orientated E/W. It had steep sides and a flattish base. Its fill, L1036, was a mid yellowish-brown, firm silty sand with occasional, small - medium sized sub-rounded and rounded flints and small sized angular pieces of chalk. It contained no finds. F1035 cut the natural (L1002) and was sealed by Subsoil L1001. It cut ?Pit F1033.

Pit F1033 was only partially exposed in Trench 16. It was semi-circular in plan (0.65+ x 1.5 x 0.23m). It had moderately sloping sides and a concave base. Its fill, L1034, was a mid orangey brown, firm silty sand with moderate small and medium sized rounded flints and small sized angular pieces of chalk. It contained no finds.

Trench 17 (Figs. 2, 4 and 5)

0.00m =20.39m AOD		
0.00 – 0.30m	L1000	Topsoil. As above Tr.1.
0.30m+	L1030	Chalky Natural. As above Tr.1.

Description: No archaeological features or finds were present.

Trench 18 (Figs. 2, 4 and 5)

0.00m = 22.20m AOD		
0.00 – 0.35m	L1000	Topsoil. As above Tr.1.
0.35 – 0.75m	L1029	Periglacial layer. As above Tr.1.
0.75m+	L1002	Sandy Natural. As above Tr.6.

Description: Trench 18 examined a large L-shaped anomaly recorded by geophysical survey. Three natural features were examined in Tr.18. No archaeological features or finds were present and thus the anomaly was likely the result of variations in geological strata.

Trench 19 (Figs. 2, 4, 5 and 7)

0.00m =20.61m AOD		
0.00 – 0.28m	L1000	Topsoil. As above Tr.1.
0.28 – 0.51m	L1001	Subsoil. As above Tr.2.
0.51m+	L1002	Sandy Natural. As above Tr.6.

Description: Like Trench 18, Trench 19 was examined a large L-shaped, anomaly recorded by the geophysical survey. It also overlay another linear anomaly. None of the anomalies were confirmed as archaeological features. One possible archaeological feature, Pit F1017, was excavated. It contained no finds.

Shallow ?Pit F1017 was oval in plan (1.6+ x 1.4 x 0.23m). It had irregular sides and an irregular base. Its fill L1018, was a mid orangey-brown, firm silty sand, with occasional, small sized subangular flints. It contained no finds. F1017 was sealed by Subsoil L1001. Its archaeological origin is questionable.

Trench 20 (Figs. 2, 4, 5 and 8)

0.00m = 22.97m AOD		
0.00 – 0.36m	L1000	Topsoil. As above Tr.1.
0.23 – 0.53m	L1001	Subsoil. As above Tr.2.
0.53+	L1030	Chalky Natural. As above Tr.1.

Description: Like Trench 19, Trench 20 examined two anomalies recorded by geophysical survey. One natural feature, Periglacial Channel F1023, was excavated and recorded.

Natural feature F1023 was irregular in plan (1.85+ x 1.4 x 0.28m). It had irregular sides and an undulating base. Its fill, L1024, was a mid orangey-brown, firm silty sand, with occasional, small sized subrounded flints. It contained no finds. F1023 was sealed by Subsoil L1001.

Trench 21 (Figs. 2, 4, 5 and 8)

0.00m = 22.85m AOD		
0.00 – 0.27m	L1000	Topsoil. As above Tr.1.
0.23 – 0.46m	L1001	Subsoil. As above Tr.2.
0.46m+	L1030	Chalky Natural. As above Tr.1.

Description: Trench 21 overlay two anomalies recorded by geophysical survey. Four ditches (F1009, F1011, F1019 and F1021) and two gullies (F1015 and F1027) were recorded. The features correspond in plan with one of the geophysical anomalies. Ditch F1009 and Gully F1015 contained abraded 11th – 13th century pottery and residual Roman pottery. The other features contained no finds.

All of the recorded linear features in Trench 21 were broadly parallel to each other. Ditches F1009 and F1011 were very close to each other and perhaps formed a double-ditch structure. Likewise Ditches F1019 and F1021. The linear features may relate to old field boundary as they are on a similar alignment to a current field boundary extending south-east from Trench 21.

Ditch F1009 was linear in plan (2.0+ x 1.3 x 0.22m), orientated NNW/SSE. It had moderately sloping sides and a concave base. Its fill, L1010, was a dark orangey-brown, firm silty sand, with occasional, small sized subrounded flints and small sized pieces of chalk. It contained abraded 11th – 12th/13th pottery and residual Roman pottery (43g). It was sealed by Subsoil L1001. F1009 was parallel to Ditch F1011.

Ditch F1011 was linear in plan (2.0+ x 1.2 x 0.28m), orientated also NNW/SSE. It had moderately sloping sides and a concave base. Its fill, L1012, was a dark orangey-brown with vertical lenses of light yellowish brown, firm silty sand, with occasional, small sized subrounded flints and small sized pieces of chalk. No finds were present. F1011 was sealed by Subsoil L1001.

Gully F1015 was linear in plan (2.2+ x 0.57 x 0.21m), orientated NNW/SSE. It had moderately sloping (almost convex) sides and a concave base. F1015 was cut into Natural L1030 and sealed by Subsoil layer. A deposit of flint gravel and silty sand forms a type of a channel around F1015. It is possible that the channel (c. 0.8m

wide) is a part of F1015. Its main fill L1016, was a mid orangey-brown, firm silty sand, with occasional, small-small/medium sized subrounded flint stones and small sized pieces of chalk. A piece of animal bone (108g) and 11th – 13th century and residual Roman pottery (50g) were present.

Ditch F1019 was linear in plan (2.6+ x 0.9 x 0.2m), orientated NNW/SSE. It had moderately sloping sides and a concave base. F1011 was cut into Natural L1030 and sealed by Subsoil L1001. Its fill L1020, was a dark orangey-brown, firm silty sand with moderate small sized subrounded flints and small sized pieces of chalk. No finds were present.

Ditch F1021 was linear in plan – very slightly curving - (2.5+ x 0.8 x 0.15m), orientated NNW/SSE. It had moderately sloping sides and a concave base. The feature cut the natural and was sealed by Subsoil L1001. Its fill L1022, was a dark orangey-brown, firm silty sand, with occasional small sized subrounded flints and small sized pieces of chalk. No finds were present.

Gully F1027 was linear in plan (1.85+ x 0.8 x 0.16m), orientated NNW/SSE. It had moderately sloping sides and a flattish base. The feature was cut the natural and was sealed by Subsoil 1001. Its fill L1028, was a dark orangey-brown, firm silty sand, with occasional, small-small/medium sized subrounded flint stones and small sized pieces of chalk. It contained no finds.

Trench 22 (Figs. 2, 4 and 5)

0.00m = 19.50m AOD		
0.00 – 0.31m	L1000	Topsoil. As above Tr.1.
0.31 – 0.42m	L1001	Subsoil. As above Tr.2.
0.42 – 1.05m	L1029	Periglacial layer. As above Tr.1.
1.05m+	L1002	Sandy Natural. As above Tr.6.

Description: No archaeological features or finds were present.

Trench 23 (Figs. 2, 4 and 5)

0.00m = 20.11m AOD		
0.00 – 0.32m	L1000	Topsoil. As above Tr.1.
0.32 – 0.47m	L1001	Subsoil. As above Tr.2.
0.47 – 1.05m	L1029	Periglacial layer. As above Tr.1.
1.05m+	L1002	Sandy Natural. As above Tr.6.

Description: Trench 23 examined two anomalies recorded in geophysical survey; one was L-shaped and was examined in Trenches 18-20 and one was an open ring. Four natural features were examined in Tr.23. No archaeological features or finds were present and thus the anomalies were likely the result of variations in geological strata.

Trench 24 (Figs. 2, 4 and 5)

0.00m = 19.89m AOD		
0.00 – 0.24m	L1000	Topsoil. As above Tr.1.
0.24 – 0.74m	L1001	Subsoil. As above Tr.2.
0.74 – 1.3m	L1029	Periglacial layer. As above Tr.1.
1.3m+	L1002	Sandy Natural. As above Tr.6.

Description: Trench 24 examined a large circular anomaly recorded in geophysical survey. Three natural features were examined in Tr.24. No archaeological features or finds were present and thus the anomaly was likely the result of variations in geological strata.

Trench 25 (Figs. 2, 4 and 5)

0.00m = 20.44 AOD		
0.00 – 0.27m	L1000	Topsoil. As above Tr.1.
0.27 – 0.75m	L1001	Subsoil. As above Tr.2.
0.75 – 1.35m	L1029	Periglacial layer. As above Tr.1.
1.35m+	L1002	Sandy Natural. As above Tr.6.

Description: Trench 25 examined two linear anomalies recorded during the geophysical survey. One natural feature was examined in Trench 25. No archaeological features or finds were present and thus the anomalies were likely the result of variations in geological strata.

Trench 26 (Figs. 2, 4 and 5)

0.00m = 19.74m AOD		
0.00 – 0.37m	L1000	Topsoil. As above Tr.1.
0.37 – 0.70m	L1029	Periglacial layer. As above Tr.1.
0.70m+	L1002	Sandy Natural. As above Tr.6.

Description: One natural feature was examined in Trench 26. No archaeological features or finds were present.

Trench 27 (Figs. 2, 4 and 5)

0.00m = 22.41m AOD		
0.00 – 0.37m	L1000	Topsoil. As above Tr.1.
0.37 – 0.42m	L1001	Subsoil. As above Tr.2.
0.42m+	L1002	Sandy Natural. As above Tr.6.

Description: Trench 27 examined a large amorphous anomaly recorded by geophysical survey. Two natural features were examined in Trench 27. No archaeological features or finds were present and thus the anomaly was likely the result of variations in geological strata.

Trench 28 (Figs. 2, 4 and 5)

0.00m = 20.37m AOD		
0.00 – 0.28m	L1000	Topsoil. As above Tr.1.
0.28 – 0.72m	L1001	Subsoil. As above Tr.2.
0.72m+	L1002	Sandy Natural. As above Tr.6.

Description: Trench 28 examined a large amorphous anomaly recorded by geophysical survey. One natural feature was examined. No archaeological features or finds were present and thus the anomaly was likely the result of undulations in geological strata.

Trench 29 (Figs. 2, 4 and 5)

0.00m = 20.31m AOD		
0.00 – 0.30m	L1000	Topsoil. As above Tr.1.
0.30 – 0.42m	L1001	Subsoil. As above Tr.2.
0.42m+	L1002	Sandy Natural. As above Tr.6.

Description: Trench 29 examined an anomaly recorded during geophysical survey. One natural feature was examined in Tr.29. No archaeological features or finds were present and thus the anomaly was likely the result of undulations in geological strata.

8 CONFIDENCE RATING

8.1 It is not felt that any factors restricted the identification of archaeological features or finds.

9 DEPOSIT MODEL

9.1 Topsoil L1001 was the uppermost layer across the site. It was dark greyish brown, friable silty sand with humus - calcareous loam, including occasional small to small/medium sized mostly subrounded, subangular flint and angular pieces of chalk. The depth of this deposit varied slightly across the site (max difference 0.1m), as the area is uneven; it slopes down from north-west to south-east. The difference in between the highest point (Tr.2) and the lowest point (Tr 22) is 3.49m. In most trenches the topsoil sealed Subsoil L1001. However in Trenches 1, 6, 10, 18 and 26 the topsoil sealed periglacial deposit L1029 and no subsoil was present. In Trenches 14 and 17 the topsoil sealed the natural (L1002 and L1030).

9.2 L1001 overlay Subsoil L1002, a mid greyish brown firm silty sand with small percentage of clay and rare inclusions (mostly small-small/medium sized subrounded flint and occasional angular pieces of chalk). The average depth of the subsoil was *c*. 0.20m but its presence was very unequal across the site. The deposit was the deepest (up to *c*. 0.50m) towards the south-eastern sector of the site (Trs.24 and Tr.25). In Trenches .6, 10, 14, 17 and 26 there was no subsoil at all. Typically the deposit was sealed by Topsoil L1001 and it sealed either periglacial deposit

L1029 or the natural (L1002 and L1030). The archaeological features were sealed by the subsoil.

9.3 The naturally occurring periglacial deposit L1029 was slightly orangey mid brown, firm silty sand with few inclusions (mostly small-small/medium sized subangular and subrounded flint). It had also very unequal presence across the site. L1029 was deepest in the central section of the site (in Tr.13 – 0.8m). The deposit was investigated mostly by the mechanical excavator. Its profile was in all cases concave – sides varying from gently sloping to moderately steep. It sealed the natural (L1002 and L1030).

9.4 Natural layer L1002 was a firm yellowish-brown sandy deposit with occasional small sized angular, small sized pieces of chalk – glacial sand. It was sealed either by Topsoil L1000, Subsoil L1001 or L1029. L1002 did not occur in all parts of the site; it was not present in parts of central and western sectors.

9.5 Natural layer L1030 was Cretaceous chalk with its upper part degraded due to periglacial action. It was sealed either by Topsoil L1000, Subsoil L1001 or L1029.

10 DISCUSSION

10.1 The features recorded in each trench are tabulated:

Trench	Context	Description	Date
14	F1013	Ditch	Undated
16	F1031	Gully	Post-medieval / early moder
	F1033	Pit	Undated
	F1035	Gully	Undated
19	F1017	?Pit	Undated
21	F1009	Ditch	?11th – 12th/13th century
	F1011	Ditch	Undated
	F1015	Gully	?11th – 13th century
	F1019	Ditch	Undated
	F1021	Ditch	Undated
	F1027	Gully	Undated

10.2 The majority of trenches contained no archaeological features and finds, and the recorded features occurred in the north-eastern and central sectors of the site (Trenches 14, 16, 19 and 21).

10.3 The majority of features contained no archaeological finds and are undated. Ditch F1009 and Gully F1015 contained a few (5 or less) sherds of 11th – 13th century pottery. The latter is abraded and may be residual, and therefore the dating of these features is not secure. Each feature also contained residual Roman pottery.

10.4 The features are mostly linear (ditches and gullies). One undated pit (F1033 Tr. 16) and a possible pit (F1017 Tr. 19) were recorded.

10.5 Interpretation of the features is uncertain as the majority are undated and isolated. The linear features in Trench 21 were broadly parallel to each other. Ditches F1009 and F1011 were very close to each other and perhaps formed a double-ditch structure. Likewise Ditches F1019 and F1021. The linear features may relate to an old field boundary as they are on a similar alignment to a current field boundary extending south-east from Trench 21.

10.6 There was a small correlation of the archaeological features with the geophysical survey data (Figs. 4 and 5). Electromagnetic anomalies were attributed to archaeological features only in Tr.21 and possibly also in Tr.14. The other geophysical survey anomalies may be attributed to uneven character of geological deposits in this area.

11 DEPOSITION OF ARCHIVE

11.1 Archive records, with an inventory, will be deposited at the Suffolk County Store. The archive will be quantified, ordered, indexed, cross-referenced and checked for internal consistency. In addition to the overall site summary, it will be necessary to produce a summary of the artefactual and ecofactual data.

11.2 The archive will be deposited within six months of the conclusion of the fieldwork. It will be prepared in accordance with the UK Institute for Conservation's *Conservation Guideline No.2* and according to the document *Deposition of Archaeological Archives in Suffolk* (SCC AS Conservation Team, 2008).

ACKNOWLEDGEMENTS

AS would like to thank Exning Homes Ltd for their co-operation and for funding the project, and their planning consultant Boyer Planning East; in particular Mr James Bailey.

AS also gratefully acknowledges the input and advice of Dr Jess Tipper of the Suffolk County Council Archaeology Service Conservation Team (SCC ASCT).

BIBLIOGRAPHY

British Geological Survey 1991, *East Anglia Sheet 52°N-00° 1:250,000 Series Quaternary Geology,* Ordnance Survey, Southampton

Gurney, D. 2003, *Standards for Field Archaeology in the East of England,* East Anglian Archaeology Occasional Paper no. 14

Institute of Field Archaeologists 1994 (revised 2008), *Standard and Guidance for Archaeological Evaluation*

Medlycott, M. (ed.) 2011, *Research and Archaeology revisited: a revised framework for the East of England*, ALGAO East of England Region, East Anglian Archaeology Occasional Papers 24

Page, W. 1925, A History of the County of Suffolk Volume Two *Victoria County History*

Smalley, R. 2012, *Geophysical Survey Report, Land South of Burwell Road, Exning,* Stratascan Report Ref J3205

SSEW 1983, *Soil Survey of England and Wales: Soils of South East England (sheet 4),* Harpenden, Rothamsted Experimental Station/Lawes Agricultural Trust

SSEW 1983, *Soil Survey of England and Wales: Legend for the 1:250,000 Soil Map of England and Wales* Harpenden, Rothamsted Experimental Station/Lawes Agricultural Trust

Web Sites

www.landis.org.uk Soils

www.bgs.ac.uk Geology

APPENDIX 1 CONCORDANCE OF FINDS BY FEATURE

Feature	Context	Trench	Description	Spot Date	Pottery	CBM (g)	A.Bone (g)	Other
1000	U/S		Topsoil			734		
1009	1010	21	Fill of ditch	11th - 12th/13th C	(4) 43			
1015	1016	21	Fill of gully	11th - 13th C	(7) 50		108	
1031	1032	16	Fill of gully			23		Slag - 40g

APPENDIX 2 SPECIALIST REPORTS

The Roman Pottery
Andrew Peachey MIfA

The evaluation recovered two sherds (27g) of slightly abraded Roman pottery, as residual material in medieval contexts.

Ditch F1009 (L1010) contained a single basal sherd (8g) of Wattisfield region reduced ware (Tomber and Dore 1998, 184), possibly from the base of a beaker or small jar. Gully F1015 (L1016) contained a single body sherd (19g) of Colchester white ware mortaria (Tomber and Dore 1998, 133) with moderately worn trituration grits of well-sorted white, grey and black flint, and quartz (1-2.5mm). Mortaria produced at Colchester were in circulation in Suffolk throughout the 2nd century AD, but were more common in the latter half of the century.

References

Tomber, R. and Dore, J. 1998, *The National Roman Fabric Reference Collection*, Museum of London, London

The Medieval Pottery
Peter Thompson

The evaluation recovered 9 abraded sherds weighing 57g from two ditches which are quantified in Table 1. Two fabrics are present all, body sherds which have been assigned site specific codes. The two 'EMS' sherds have internal girth grooves and may derive from a slow wheel and are late Saxon/early medieval in date. The remaining 7 sherds are similar in appearance to Grimston coarse ware, but contain varying amounts of voids some at least of which are from burnt organics. This is probably a local equivalent of Grimston ware and is of similar date.

Key:

EMS: Early medieval sandy ware. Fine to medium sand, rare coarse flint or other mineral. Dark grey cores, grey/mid brown mottled surfaces, internal girth grooves 10th-12th centuries?

EMW: Early medieval ware. Fine to medium sand. Rare to common voids from burnt organics? Occasional small black iron rich and white calcitic inclusions. Thick walled with pale grey core, oxidised orange surfaces 11th – 13th centuries.

Feature	Context	Quantity	Date	Comment
Ditch 1009	1010	2x16g EMS 1x16g EMW	11th-12th/13th	
Ditch 1015	1016	6x25g EMW	11th-13th	

Table 1: Quantification of sherds by context

References

Little A. with Lentowicz I. 1994, *'The Pottery'* in Leah M. (ed.) The Late Saxon and Medieval Pottery Industry of Grimston, Norfolk: Excavations 1962-92, *East Anglian Archaeology Report* 64, 84-100

The Ceramic Building Materials

Andrew Peachey MIfA

The evaluation recovered two fragments (757g) of late post-medieval to early modern CBM. The former, recovered from Topsoil L1000 comprised a fragment of 35mm thick red flooring brick (734g) probably produced in the 19th century, while the latter, contained in Gully F1031 (L1032) comprised a highly abraded small fragment (23g) miscellaneous post-medieval to early modern brick.

The Environmental Samples

Dr John Summers

Introduction

A total of four bulk soil samples for environmental archaeological assessment were collected and processed during trial excavations at Burwell Road, Exning. The only spot dated deposit represented by the samples was L1016 (F1015), which contained pottery dating to the 2nd century. This report presents the results from the assessment of the bulk sample light fractions and discusses the significance and potential of the material recovered.

Methods

Samples were processed at the Archaeological Solutions Ltd facilities in Bury St. Edmunds using a Siraf style flotation tank. The light fractions were washed onto a mesh of 250µm (microns), while the heavy fractions were sieved to 500µm. The dried light fractions were scanned under a low power stereomicroscope (x10-x30 magnification). Botanical and molluscan remains were identified and recorded using a semi-quantitative scale (X = present; XX = common; XXX = abundant). Reference literature (Cappers *et al.* 2006; Jacomet 2006; Kerney and Cameron 1979; Kerney 1999) and a reference collection of modern seeds was consulted where necessary. Potential contaminants, such as modern roots, seeds and invertebrate fauna were also recorded in order to gain an insight into possible disturbance of the deposits.

Results

The assessment data from the bulk sample light fractions are presented in Table 2.

Plant macrofossils

Carbonised plant macrofossils were largely absent from the bulk sample light fractions. The only remains encountered were a number of probable carbonised root/ tuber fragments in L1038 and indeterminate carbonised organic material (vitreous material resulting from the burning of organic substances) in L1016 and L1032.

Terrestrial molluscs

Numerous shells from terrestrial molluscs were encountered in the samples. The majority of the taxa, such as *Helicella itala, Pupilla muscorum* and *Vallonia* sp., reflect grassland habitats. Other taxa, such as *Discus rotundatus* and *Trichia hispida* group, reflect conditions of moister, taller vegetation. These could all represent habitats within the sampled features. The number of shells encountered indicates favourable preservation conditions for such remains.

Contaminants

Modern rootlets were present in all samples, although in small concentrations. Burrowing molluscs (*Cecilioides acicula*) were common in three of the four samples and could have caused some disturbance of the deposits.

Conclusions and statement of potential

Based on the four samples assessed, there appears to be little potential for further recovery of carbonised plant remains should future work be conducted at the site. The preservation of terrestrial molluscs was good and such a resource could provide detailed information on the local environmental setting for features encountered in any future investigations.

No further information can be gained from the present samples and no further work on the assemblage is recommended.

References

Cappers, R.T.J., Bekker R.M. and Jans J.E.A. 2006, *Digital Seed Atlas of the Netherlands. Groningen Archaeological Studies Volume 4*, Barkhuis Publishing, Eelde

Jacomet, S. 2006, *Identification of Cereal Remains from Archaeological Sites* (2nd edn), Laboratory of Palinology and Palaeoecology, Basel University

Kerney, M.P. 1999, *Atlas of the Land and Freshwater Molluscs of Britain and Ireland*, Harley Books, Colchester

Kerney, M.P. and Cameron, R.A.D. 1979, *A Field Guide to Land Snails of Britain and North-West Europe*, Collins, London

Site code	Sample number	Context	Feature	Spot date	Volume (litres)	Cereals			Non-cereal taxa		Charcoal		Molluscs		Contaminants					Other remains
						Cereal grains	Cereal chaff	Notes	Seeds	Notes	Charcoal>2mm	Notes	Molluscs	Notes	Roots	Molluscs	Modern seeds	Insects	Earthworm capsules	
EXG101	2	1016	1015	*c.*2nd century AD	20	-	-	-	-	-	-	-	XXX	*Cochlicopa* sp., *Discus rotundatus, Helicella itala, Pupilla muscorum*	XX	XX	X	-	-	Indet. carb organic (X)
EXG101	3	1032	1031	-	10	-	-	-	-	-	-	-	XX	*Cepea* sp., *Helicella itala, Pupilla muscorum*	X	XX	X	-	-	Indet. carb organic (X)
EXG101	4	1038	1037	-	10	-	-	-	-	-	-	-	X	*Pupilla muscorum, Trichia hispida* group	X	X	X	-	-	Root/ tuber fragments (XX)
EXG101	7	1029	1028	-	10	-	-	-	-	-	-	-	XX	*Cochlicopa* sp., *Discus rotundatus, Helicella itala, Pupilla muscorum, Vallonia* sp.	X	XX	-	-	-	-

Table 2: Results from the assessment of bulk sample light fractions

APPENDIX 3 PROJECT SPECIFICATION

LAND SOUTH OF BURWELL ROAD, EXNING, SUFFOLK

WRITTEN SCHEME OF INVESTIGATION FOR
AN ARCHAEOLOGICAL EVALUATION

7th December 2012

LAND SOUTH OF BURWELL ROAD, EXNING, SUFFOLK

WRITTEN SCHEME OF INVESTIGATION FOR
AN ARCHAEOLOGICAL EVALUATION

1 INTRODUCTION

1.1 This specification has been prepared in response to a brief issued by Suffolk County Council Archaeological Service Conservation Team (SCC AS-CT, Jess Tipper, dated 6th December 2012). It provides for an archaeological evaluation in advance of proposals to construct a new residential development on land south of Burwell Road, Exning, Suffolk (NGR TL 613 656). The evaluation is required to accompany the proposed planning application (Forest Heath DC Ref. F/2012/0552/OUT), on advice from SCC AS-CT.

1.2 It is understood that the programme of archaeological investigation should comprise an archaeological field evaluation, to comply with the planning requirement of the local planning authority (on advice from SCC AS-CT).

2 COMPLIANCE

2.1 The brief has been read and understood. If AS carried out the evaluation, AS would comply with SCC AS-CT's requirements.

3 SITE & DEVELOPMENT DESCRIPTION ARCHAEOLOGICAL BACKGROUND

3.1 The site lies in an area of archaeological potential to the south of properties fronting Burwell Road, Exning. It is an arable field of some 6.05ha.

3.2 It is proposed to construct a new residential development on the site.

3.3 The site has a potential for archaeological remains, as highlighted on the Suffolk Historic Environment Record, but has not been the subject of any systematic investigation. To the south of the site, a large scatter of prehistoric, Roman and medieval metalwork has been recorded, indicative of occupation (HER EXG 051).

3.4 A geophysical survey has been carried out as the first stage of investigation (Smalley 2012). This revealed geophysical anomalies of potential archaeological origin across the proposed development site.

3.5 No anomalies were identified as of 'probable' archaeological origin.

3.6 Some anomalies of 'possible' archaeological origin were identified. These include a number of positive linear and area anomalies across the survey area, possibly pits and ditches, though possibly of natural origin. These include two large circular anomalies in the central and eastern part of the site. A large circular

anomaly was also recorded in the western part of other site, which may relate to an earthwork rather than a ditch. Magnetic 'spikes' indicating ferrous objects were also recorded, most likely to be modern debris. Other anomalies included two swathes of magnetic variation, thought to be of geological/pedalogical origin, close centred linear anomalies thought to relate to modern ploughing, and linear anomalies on the north and east perimeter of the area, though to be modern vehicle tracks.

4 BRIEF FOR THE ARCHAEOLOGICAL EVALUATION SPECIFICATION FOR A TRENCHED EVALUATION GENERAL MANAGEMENT

4.1 The principal research objectives for the evaluation as a whole include:

- To establish whether any archaeological deposit exists in the area, with particular regard to any which are of sufficient importance to merit preservation *in situ.*
- To identify the date, approximate form and purpose of any archaeological deposit within the application area, together with its likely extent, localised depth and quality of preservation.
- To evaluate the likely impact of past land uses, and the possible presence of masking colluvial/alluvial deposits, along with the potential for the survival of environmental evidence
- To provide sufficient information to construct an archaeological conservation strategy dealing with preservation, the recording of archaeological deposits, working practices, timetables and orders of cost.
- Establish the potential for waterlogged organic deposits in the proposal area, their location and level and vulnerability to damage by development.

4.2 Research Design

4.2.1 The research priorities for the region are set out in Glazebrook (1997) and Brown & Glazebrook (2000) and updated by Medlycott and Brown (2008) and Medlycott (2011). The key issues for the Neolithic and Bronze Age (as set out by Brown & Murphy in Brown & Glazebrook 2000, 9-13) centre on the theme of the development of farming and the attendant development and integration of monuments, fields and settlements. Medlycott & Brown (2008) and Medlycott (2011, 13) suggest that future research on the Neolithic should include synthetic and regional studies for the region; an examination of the Mesolithic/Neolithic transition through radiocarbon dates; the establishment of a chronology for Neolithic ring-ditches; improved understanding of the chronological development of pottery; the excavation and study of cropmark complexes; greater understanding of burial practices; a study of the inter-relationships of settlements; greater use of scientific methods of dating and modelling of the environmental conditions during this period; targeted programmes of sedimentological, palynological and macrofossil analyses of sediment sequences in valley bottoms, lakes or the intertidal zone; and the human impact on the natural landscape during this period. The nature of Neolithic burial in the region and the pattern of burial practice, including the relationship between settlement sites and burial, require further research. Settlement sites themselves also form part of an important research subject as there is a requirement to identify if

a consensus exists on the subject of non-permanent settlement in the Neolithic (Medlycott 2011, 13). Further work on understanding the effects of plough damage on Neolithic sites is considered to be an important research subject for the region (Medlycott 2011, 13).

4.2.2 Inter-relationships between settlements and greater understanding of patterns of burial practice are important areas of research for the Bronze Age (Medlycott & Brown 2008). Medlycott (2011, 21) identifies artefact studies as of particular importance for the study of the Bronze Age in the region; the typological identification of later Bronze Age pottery linked to close radiocarbon dating, the further study of Bronze Age flintworking and the significance of hoarding and other depositional practices are all identified as being key research subjects. Artefact studies can contribute to the refinement of chronologies for the period and to an assessment of the reasons behind the marked divide in research results between the northern and southern parts of the region, which are identified by Medlycott (2011, 21) as important research areas. Like the Neolithic, sedimentological, palynological and macrofossil analyses of sediment sequences are considered to be important areas of research as are the effects of colluviation and the possibility that colluvial deposits mask some significant sites (Medlycott 2011, 21).

4.2.3 Research topics for the Iron Age set out by Bryant (in Brown & Glazebrook 2000, 14-18) include further research into chronologies, precise dating and ceramic assemblages, further research into the development of the agrarian economy (particularly with regard to field systems), research into settlement chronology and dynamics, research into processes of economic and social change during the late Iron Age and Romano-British transition (particularly with regard to the development of Aylesford/Swarling and Roman culture, and also regional differences and tribal polities in the late Iron Age and further research into *oppida* and ritual sites), further analysis of development of social organisation and settlement form/function in the early and middle Iron Age, further research into artefact production and distribution and the Bronze Age/Iron Age transition. Medlycott & Brown (2008) and Medlycott (2011, 29-32) build on these themes, paying particular attention to chronological and spatial development and variation and adding subjects as the Bronze Age/Iron Age transition and manufacturing and industry.

4.2.4 Medlycott (2011, 47) identifies regional variation and tribal distinctions as underlying themes for research in the Roman period. Research topics for the Roman period previously set out by Going & Plouviez (in Brown & Glazebrook 2000, 19-22) include analysis of early and late Roman military developments, further analysis of large and small towns, evidence of food consumption and production, further research into agricultural production, landscape research (in particular further evidence for potential woodland succession/regression and issues of relict landscapes, as well as further research into the road network and bridging points), further research into rural settlements and coastal issues. Medlycott (2011, 47-48) states that these research areas remain valid and presents updated consideration of them. To these themes Medlycott & Brown (2008) and Medlycott (2011, 47-48) add rural settlements and landscapes, the process of Romanisation in the region, the evidence for the Imperial Fen Estate, and the Roman/Saxon transition.

4.2.5 Wade (in Brown & Glazebrook 2000, 23-26) identifies research topics for the rural landscape in the Saxon and medieval periods. These include examination of population during this period (distribution and density, as well as physical structure), settlement (characterisation of form and function, creation and testing of settlement diversity models), specialisation and surplus agricultural production, assessment of craft production, detailed study of changes in land use and the impact of colonists (such as Saxons, Danes and Normans) as well as the impact of the major institutions such as the Church. Ayers (in Brown & Glazebrook, 2000) discusses these research topics in more detail. For demography, issues include assessment of population structures, density and mobility, urban sustainability, immigration and rural colonisation and housing/provisioning. For social organisation, issues include assessment of the impact of royal vills, major institutions and the Church on urban settlement, territorial boundaries in proto-urban and urban settlements, the effect of national political developments, ranking and status in settlements, spatial analysis, wealth distribution, specialism, acquisition of raw materials, building form and function, markets and commercial/corporate activity. Economic issues of the above also need to be considered, particularly with regard to industrial zoning. The impact of culture and religion could include issues such as identifying characteristics of urban culture, its growth, complexity and values. The Church and its influence on the burgeoning towns must also be addressed. As Murphy notes in Brown and Glazebrook (2000, 31), urban environmental archaeology should be approached by analysis of environmental 'events', processes and study of relationships with producing sites in the rural hinterland.

4.2.6 Medlycott (2011, 57) states that he study of the Anglo-Saxon period still requires further cooperation between historians and archaeologists. Important research issues for this period comprise: the Roman/Anglo-Saxon transitional period; settlement distribution, which suffers from problems associated with the identification of Saxon settlement sites; population modelling and demographics, which has the potential to be advanced by modern scientific methods; differences within the region in terms of settlement type and economic practice and subjects related to this such as links with the continent, trading practices and cultural influences; rural landscapes and settlements, including detailed study of the changes and developments in such settlements over time and the influence of Saxon landscape organisation and settlements on these issues in the medieval period; towns and their relationships with their hinterland; infrastructure, including river management, the identification of ports and harbours and the role of existing infrastructure in shaping the Saxon period landscape; the economy, based on palaeoenvironmental studies; ritual and religion; the effect of the Danish occupation; and artefact studies (Medlycott 2011, 57-59).

4.2.7 The issues identified by Ayers (in Brown & Glazebrook, 2000) and Wade (in Brown & Glazebrook, 2000) remain valid research subjects (Medlycott 2011, 70) for the medieval period. The study of landscapes is dominated by issues such as water management and land reclamation for large parts of the region, the economic development of the landscape and the region's potential to reveal information regarding field systems, enclosures, roads and trackways. Linked to the study of the landscape are research issues such as the built environment and infrastructure; the main communication routes through the region need to be identified and synthesis needs to be carried out regarding the significance, economic and social importance of historic buildings in the region (Medlycott 2011, 70-71). Also considered to be

important research subjects for the medieval period are rural settlements, towns, industry and the production and processing of food and demographic studies (Medlycott 2011, 70-71).

4.2.8 The research subjects identified as important for the post-medieval and modern periods (see Medlycott 2011, 72-80) expand on those set out by Gilman *et al* (in Brown & Glazebrook, 2000) which focussed on the subjects of fortifications, parks and gardens and industrialisation and manufacture. Medlycott (2011) stresses the importance of the built and environment and the use of the Listed Buildings databases and thematic surveys in understanding this. The subject of industry and infrastructure, which is clearly of great importance for this period, remains a key research subject for the region with particular attention being paid to rural industries, the processing of food for urban markets and the development and character of the region's primary communication roots. Landscapes, and the effect of social changes, such as the Dissolution and the enclosure of greens and commons, on them are considered to be an area of research. The region's military sites and their impact on the development of eastern England, on its landscapes and on its appearance are also considered to be of importance. Towns, their development and their impact on the landscape, require further study. Issues such as economic and social influences of towns on their hinterlands and neighbours are identified as being of importance, as are the development of specific urban forms.

4.2.9 The principal research issues for the site will be to identify and characterise the nature of the anomalies recorded by the geophysical survey and also to test 'blank' areas identified by the survey.

References

Brown, N & Glazebrook, J (eds), 2000, *Research and Archaeology: A Framework for the Eastern Counties. 2. Research Agenda and Strategy*, East Anglian Archaeology Occasional Papers 8

Glazebrook, J (eds), 1997, *Research and Archaeology: A Framework for the Eastern Counties. 1. Resource Assessment,* East Anglian Archaeology Occasional Papers 3

Medlycott, M & Brown, N, 2008, *Revised East Anglian Archaeological Research Frameworks,* www.eaareports/algaoee

Medlycott, M. (ed.) 2011, *Research and Archaeology revisited: a revised framework for the East of England*, ALGAO East of England Region, East Anglian Archaeology Occasional Papers 24

Smalley, R, 2012, *Geophysical Survey Report, Land South of Burwell Road, Exning,* Stratascan Report Ref J3205

5 TRIAL TRENCH EVALUATION

5.1 Details of Senior Project Staff

5.1.1 AS has developed a professional and well-qualified team who have undertaken numerous archaeological projects (both desk-based and field evaluations) on all types of developments, including commercial, residential, road schemes and golf courses. AS is a Registered Organisation of the IFA.

5.1.2 Profiles of key project staff are provided (Appendix 2).

A Method Statement is presented

Trial Trench Evaluation Appendix 1

5.2 The evaluation will conform with the guidelines set down in the brief, SCC AS-CT document *Requirements for a Trenched Archaeological Evaluation* 2011 Ver 1.3) and the Institute for Archaeologists *Standard and Guidance for Archaeological Evaluations (revised 2008)* and *Standard and Guidance for Archaeological Desk-Based Assessments (revised 2008).* It will also adhere to the document *Standards for Field Archaeology in the East of England* (Gurney 2003).

5.3 The SCC AS-CT brief requires a programme of archaeological trial trenching, and stipulates that a 3.5% sample of the c.6ha site should be subject to trenching. 29 trenches, each 40m x 1.8m are proposed, to allow for the c.1167 linear metres of trenching required by the brief. A proposed trench plan is presented. AS is happy to review the scale/location of the trenches following comment from the client and/or SCC AS-CT.

5.4 The environmental strategy will adhere to the guidelines issued by English Heritage (*Environmental Archaeology; A guide to the theory and practice of methods, from sampling and recovery to post-excavation,* Centre for Archaeology Guidelines, 2011). An environmentalist will be invited to visit the site if remains of interest are found. Dr Rob Scaife will be the Environmental Coordinator for the project. The specialist will make his/her results known to Helen Chappell who co-ordinates environmental archaeology in the region on behalf of English Heritage. It will be particularly important on this project to identify any palaeoenvironmental remains and to identify any waterlogged remains present on the site.

5.5 Estimate of time and resources required for each phase, to complete the trial trenching, project archive and the production of an evaluation report.

Trial Excavation
Processing, Cataloguing and Conservation of Finds
Preparation of Report and Archive *c*.15 Days

Staff on site: a Project Officer and Site Assistant/s (as necessary)

5.6 In advance of the field work AS will liaise with the County HER to fulfil their requirements for the long term deposition of the project archive. These will

encompass: their collection policy, and their financial and technical requirements for long term storage. The resources include provision for the long term-deposition of the project archive.

5.7 Details of staff and specialist contractors are provided (Appendix B). The project will be managed by Claire Halpin MIFA /Jon Murray MIFA.

5.8 AS is a member of FAME formerly the Standing Conference of Archaeological Unit Managers (SCAUM) and operates under the `Health & Safety in Field Archaeology Manual'. A risk assessment and management strategy will be completed prior to the start of works on site.

5.9 AS is a member of the Council for British Archaeology and is insured under their policy for members.

6 SERVICES

6.1 The client is to advise AS of the position of any services which traverse the site.

7 SECURITY

7.1 Throughout all site works care will be taken to maintain all existing security arrangements, and to minimise disruption.

8 REINSTATEMENT

8.1 No provision has been made for reinstatement, excepting simple backfilling.

9 REPORT REQUIREMENTS

9.1 The report will include (as a minimum):

a) The archaeological background.
b) A consideration of the aims and methods adopted in the course of the recording.
c) A detailed account of the nature, location, extent, date, significance and quality of any archaeological evidence recorded.
d) Excavation methodology and detailed results including a suitable conclusion and discussion.
e) Plans and sections of any recorded features and deposits.
f) Discussion and interpretation of the evidence. An assessment of the projects significance in a regional and local context and appendices.
g) All specialist reports or assessments.
h) A concise non-technical summary of the project results.
i) A HER summary sheet.

j) An OASIS summary sheet.

10 ARCHIVE

10.1 The requirements for archive storage will be agreed with the County HER.

10.2 The archive will be deposited within six months of the conclusion of the fieldwork. It will be prepared in accordance with the UK Institute for Conservation's *Conservation Guideline No.2* and according to the document *Deposition of Archaeological Archives in Suffolk* (SCC AS Conservation Team, 2008). A unique event number will be obtained from the County HER Officer.

10.3 The full archive of finds and records will be made secure at all stages of the project, both on and off site. Arrangements will be made at the earliest opportunity for the archive to be accessed into the collections of Suffolk HER; with the landowner's permission in the case of any finds. It is acknowledged that it is the responsibility of the field investigation organisation to make these arrangements with the landowner and HER. The archive will be adequately catalogued, labelled and packaged for transfer and storage in accordance with the guidelines set out in the United Kingdom Institute for Conservation's *Conservation Guidelines No.2* and the other relevant reference documents.

10.4 Archive records, with inventory, are to be deposited, as well as any donated finds from the site, at the county HER and in accordance with their requirements. The archive will be quantified, ordered, indexed, cross-referenced and checked for internal consistency. In addition to the overall site summary, it will be necessary to produce a summary of the artefactual and ecofactual data. A unique accession number will be obtained from the HER.

APPENDIX A
METHOD STATEMENT

Method Statement for the recording of archaeological remains

The archaeological evaluation will be conducted in accordance with the project brief, and the code of the Institute of Field Archaeologists.

1 Mechanical Excavation

1.1 A mechanical excavator fitted with a wide toothless bucket will be used to remove the topsoil/overburden. The machine will be powerful enough for a clean job of work and be able to mound spoil neatly, at a safe distance from the trench edges.

1.2 The mechanical stripping will be controlled, and the mechanical excavator will only operate under the full-time supervision of an experienced archaeologist.

2 Site Location Plan

2.1 On conclusion of the mechanical excavation, a `site location plan', based on the current Ordnance Survey 1:1250 map and indicating site north, will be prepared. This will be supplemented by an `area plan' at 1:200 (or 1:100) which will show the location of the area(s) investigated in relationship to the development area, OS grid and site grid.

3 Manual Cleaning & Base Planning of Archaeological Features

3.1 Exposed areas will be hand-cleaned to define archaeological features sufficient to produce a base plan.

4 Full Excavation

Excavation of Stratified Sequences

The trenches will be excavated according to phase, from the most recent to the earliest, and the phasing of features will be distinguished by their stratigraphic relationships, fills and finds.

Deep features e.g. quarry holes, may incorporate stratified deposits which will be excavated by hand-dug sections and recorded.

Excavation of Buildings

Building remains are likely to comprise stake holes, post holes and slots/gullies, masonry foundations and low masonry walls. Associated features may be present e.g. hearths.

The features comprising buildings will be excavated fully and in plan/phase, to a level sufficient for the requirements of an evaluation.

Full Excavation

Industrial remains and intrinsically interesting features e.g hearths, burials will clearly merit full excavation, though will be excavated sufficient to characterise such deposits within the context of an evaluation. Discrete features associated with possible structures and/or settlement will be fully excavated, again sufficient to characterise them for the purposes of an evaluation.

Ditches

The ditches will be excavated in segments up to 2m long, and the segments will be placed to provide adequate coverage of the ditches, establish their relationships and obtain samples and finds.

5 Written Record

5.1 All archaeological deposits and artefacts encountered during the course of the excavation will be fully recorded on the appropriate context, finds and sample forms.

5.2 The site will be recorded using AS.'s excavation manual which is directly comparable to those used by other professional archaeological organisations, including English Heritage's own Central Archaeological Service.

6 Photographic Record

6.1 An adequate photographic record of the investigations will be made. It will include black and white prints and colour transparencies (on 35mm) illustrating in both detail and general context the principal features and finds discovered. It will also include `working and promotional shots' to illustrate more generally the nature of the archaeological operations. The black and white negatives and contacts will be filed, and the colour transparencies will be mounted using appropriate cases. All photographs will be listed and indexed.

7 Drawn Record

7.1 A record of the full extent, in plan, of all archaeological deposits encountered will be drawn on A1 permatrace. The plans will be related to the site, or OS, grid and be drawn at a scale of 1:50 or 1:20, as appropriate. In addition where appropriate,

e.g. recording an inhumation, additional plans at 1:10 will be produced. The sections of all archaeological contexts will be drawn at a scale of 1:10 or, where appropriate, 1:20. The OD height of all principal strata and features will be calculated and indicated on the appropriate plans and sections.

8 Recovery of Finds

GENERAL

The principal aim is to ensure that adequate provision is made for the recovery of finds from all archaeological deposits.

The Small Finds, e.g. complete pots or metalwork, from all excavations will be 3-dimensionally recorded.

A metal detector will be used to enhance finds recovery. The metal detector survey will be conducted on conclusion of the topsoil stripping, and thereafter during the course of the excavation. The spoil tips will also be surveyed. Regular metal detector surveys of the excavation area and spoil tips will reduce the loss of finds to unscrupulous users of metal detectors (treasure hunters). All non-archaeological staff working on the site should be informed that the use of metal detectors is forbidden.

WORKED FLINT

When flint knapping debris is encountered large-scale bulk samples will be taken for sieving.

POTTERY

It is important that the excavators are aware of the importance of pottery studies and therefore the recovery of good ceramic assemblages.

The pottery assemblages are likely to provide important evidence to be able to date the structural history and development of the site.

The most important assemblages will come from `sealed' deposits which are representative of the nature of the occupation at various dates, and indicate a range of pottery types and forms available at different periods.

'Primary' deposits are those which contain sherds contemporary with the soil fill and in simple terms this often means large sherds with unabraded edges. The sherds have usually been deposited shortly after being broken and have remained undisturbed. Such sherds are more reliable in indicating a more precise date at which the feature was `in use'. Conversely, 'secondary' deposits are those which often have small, heavily abraded sherds lacking obvious conjoins. The sherds are derived from earlier deposits.

HUMAN BONE

Any human remains present would not normally be excavated at the stage of an evaluation, but would be protected and preserved in situ, on advice from SCC AS-CT. Should human remains be discovered and be required to be removed, the coroner will be informed and a licence from the Ministry of Justice sought immediately; both the client and the monitoring officer will also be informed. Any excavation of human remains at the stage of an evaluation would only be carried out following advice from SCC AS-CT. Excavators would be made aware, and comply with, provisions of Section 25 of the Burial Act of 1857 and pay due attention to the requirements of Health & Safety.

ANIMAL BONE

Animal bone is one of the principal indicators of diet. As with pottery the excavators will be alert to the distinction of primary and secondary deposits. It will also be important that the bone assemblages are derived from dateable contexts.

ENVIRONMENTAL SAMPLING

The sampling will adhere to the guidelines prepared by English Heritage and the specialist will make his/her results known to Helen Chappell who co-ordinates environmental archaeology in the region on behalf of English Heritage. The project will also accord with the recent guidelines of the English Heritage document *Environmental Archaeology, a guide to the theory and practice of methods, from sampling and recovery to post-excavation*, Centre for Archaeology Guidelines 2011.

Provision will be made for the sampling of appropriate materials for specialist and/or scientific analysis (e.g. radiocarbon dating, environmental analysis). The location of samples will be 3-dimensionally recorded and they will also be shown on an appropriate plan. AS has its own environmental sampling equipment (including a pump and transformer) and, if practical, provision will be made to process the soil samples during the fieldwork stage of the project.

If waterlogged remains are found advice on sampling will be obtained on site from Dr Rob Scaife. Dr Rob Scaife and AS will seek advice from the EH Regional Scientific Advisor if significant environmental remains are found.

The study of environmental archaeology seeks to understand the local and near-local environment of the site in relation to phases of human activity and as such is an important and integral part of any archaeological study. .

Environmental remains, both faunal and botanical, along with pedological and sedimentological analyses may be used to understand the environment and the impact of human activity.

There may be a potential for the recovery of a range of environmental remains (ecofacts) from which data pertaining to past environments, land use and agricultural economy should be forthcoming.

Sampling strategies on evaluations aim to determine the potential of the site for both biological remains (plants, small vertebrates) and small sized artefacts which would otherwise not be collected by hand. The number/range of samples taken will represent the range of feature types encountered, but with an aim of at least three samples from each feature type.

For plant remains, the samples taken at evaluation stage would aim to characterise:

- The range of preservation types (charred, mineral-replaced, waterlogged) and their quality.
- Any differences in remains from dated/undated features.
- Variation between different feature types/areas.

To realise the potential of the environmental material encountered, a range of specialists from different disciplines is likely to be required. The ultimate goal will be the production of an interdisciplinary environmental study which can be of value to an understanding of, and integrated with, the archaeology.

Organic remains may allow study of the contemporary landscape (occupation/industrial/agricultural impact and land use) and also changes after the abandonment of the site.

The nature of the environmental evidence

Aspects of sampling and analysis may be divided into four broad categories; faunal remains, botanical remains, soils/sediments and radiocarbon dating measurements.

a) Faunal remains: These comprise bones of macro and microfauna, birds, molluscs and insects.

a.i) Bones: The study of the animal bone remains, in particular domestic mammals, domestic birds and marine fish will enhance understanding of the development of the settlement in terms of the local economy and also its wider influence through trade. The study of the small animal bones will provide insight into the immediate habitat of any settlement.

The areas of study covered may include all of the domestic mammal and bird species, wild and harvested mammal, birds, marine and fresh water fish in addition to the small mammals, non-harvest birds, reptiles and amphibia.

Domestic mammalian stock, domestic birds and harvest fish

The domestic animal bone will provide insight into the different phases of development of any occupation and how the population dealt with the everyday aspect of managing and utilising all aspects of the animal resource.

Small animal bones

Archaeological excavation has a wide role in understanding humans' effect on the countryside, the modifications to which have in turn affected and continue to affect

their own existence. Small animals provide information about changing habitats and thereby about human impact on the local environment.

a.ii) Molluscs: Freshwater and terrestrial molluscs may be present in ditch and pit contexts which are encountered. Sampling and examination of molluscan assemblages if found will provide information on the local site environment including environment of deposition.

a.iii) Insects: If suitable waterlogged contexts (pit, pond and ditch fills) are encountered (which can potentially be expected to be encountered on the project), sampling and assessment will be carried out in conjunction with the analysis of waterlogged plant remains (primarily seeds) and molluscs. Insect data may provide information on local site environment (cleanliness etc.) as well as proxies for climate and vegetation communities.

b) Botanical remains: Sampling for seeds, wood, pollen and seeds are the essential elements which will be considered. The former are most likely to be charred but possibly also waterlogged should any wells/ponds be encountered.

b.i) Pollen analysis: Sampling and analysis of the primary fills and any stabilisation horizons in ditch and pit contexts which may provide information on the immediate vegetation environment including aspects of agriculture, food and subsistence. These data will be integrated with seed analysis.

b.ii) Seeds: It is anticipated that evidence of cultivated crops, crop processing debris and associated weed floras will be present in ditches and pits. If waterlogged features/sediments are encountered (for example, wells/ponds) these will be sampled in relation to other environmental elements where appropriate (particularly pollen, molluscs and possibly insects).

c) Soils and Sediments: Characterisation of the range of sediments, soils and the archaeological deposits are regarded as crucial to and an integral part of all other aspects of environmental sampling. This is to afford primary information on the nature and possible origins of the material sampled. It is anticipated that a range of 'on-site' descriptions will be made and subsequent detailed description and analysis of the principal monolith and bulk samples obtained for other aspects of the environmental investigation. Where considered necessary, laboratory analyses such as loss on ignition and particle size may also be undertaken. A geoarchaeologist will be invited to visit the site as necessary to advise on sampling.

d) Radiocarbon dating: Archaeological/artifactual dating may be possible for most of the contexts examined, but radiocarbon dating should not be ruled out

Sampling strategies

Provision will be made by the environmental co-ordinator that suitable material for analysis will be obtained. Samples will be obtained which as far as possible will meet the requirements of the assessment and any subsequent analysis.

a) Soil and Sediments: Samples taken will be examined in detail in the laboratory. An overall assessment of potential will be carried out. Analysis of particle size and loss on ignition, if required would be undertaken as part of full analysis if assessment demonstrates that such studies would be of value.

b) Pollen Analysis: Contexts which require sampling may include stabilisation horizons and the primary fills of the pits and ditches, and possibly organic well/pond fills. It is anticipated that in some cases this will be carried out in conjunction with sampling for other environmental elements, such as plant macrofossils, where these are also felt to be of potential.

c) Plant Macrofossils: Principal contexts will be sampled directly from the excavation for seeds and associated plant remains. It is anticipated that primarily charred remains will be recovered, although provision for any waterlogged sequences will also be made (see below). Sampling for the former will, where possible (that is, avoiding contamination) comprise samples of an average of 40-60 litres which will be floated in the AS facilities for extraction of charred plant remains. Both the flot and residues will be kept for assessment of potential and stored for any subsequent detailed analysis. The residues will also be examined for artifactual remains and also for any faunal remains present (cf. molluscs). Where pit, ditch, well or pond sediments are found to contain waterlogged sediments, principal contexts will be sampled for seeds and insect remains. Standard 5 litre+ samples will be taken which may be sub-sampled in the laboratory for seed remains if the material is found to be especially rich. The full sample will provide sufficient material for insect assessment and analysis.

d) Bones: Predicting exactly how much of what will be yielded by the excavation is clearly very difficult prior to excavation and it is proposed that in order to efficiently target animal bone recovery there should be a system of direct feedback from the archaeozoologist to the site staff during the excavation, allowing fine tuning of the excavation strategy to concentrate on the recovery of animal bones from features which have the highest potential. This will also allow the faunal remains to materially add to the interpretation as the excavation proceeds. Liaison with other environmental specialists will need to take place in order to produce a complete interdisciplinary study during this phase of activity. In addition, this feedback will aid effective targeting of the post-excavation analysis.

e) Insects: If contexts having potential for insect preservation are found, samples will be taken in conjunction with waterlogged plant macrofossils. Samples of 5 litres will suffice for analysis and will be sampled adjacent to waterlogged seed samples and pollen; or where insufficient context material is available provision will be made for exchange of material between specialists.

f) Molluscs: Terrestrial and freshwater molluscs. Samples will be taken from a column from suitable ditches. Pits may be sampled, based on the advice of the Environmental Consultant and/or English Heritage Regional Advisor. Provision will also be made for molluscs obtained from other sampling aspects (seeds) to be examined and/or kept for future requirements.

g) Archiving: Environmental remains obtained should be stored in conditions appropriate for analysis in the short to medium term, that is giving the ability for full analysis at a later date without any degradation of samples being analysed. The results will be maintained as an archive at AS and supplied to the EH regional co-ordinator as requested.

Waterlogged Deposits/Remains

Should waterlogged deposits (such as wells/deep ditches) be encountered, provision has been made for controlled hand excavation and sampling. Dr Rob Scaife will visit to advise of sampling as required, and AS will take monolith samples as necessary for the recovery of palaeoenvironmental information and dating evidence.

Scientific/Absolute Dating

- Samples will be obtained for potential scientific/absolute dating as appropriate (eg Carbon-14).

FINDS PROCESSING

The project director will have overall responsibility for the finds and will liaise with AS's own finds personnel and the relevant specialists. A person with particular responsibility for finds on site will be appointed for the excavation. The person will ensure that the finds are properly labelled and packaged on site for transportation to AS's field base. The finds processing will take place in tandem with the excavations and will be under the supervision of AS's Finds Officer.

The finds processing will entail first aid conservation, cleaning (if appropriate), marking (if appropriate), categorising, bagging, labelling, boxing and basic cataloguing (the compilation of a Small Finds Catalogue and quantification of bulk finds) i.e. such that the finds are ready to be made available to the specialists. The Finds Officer, having been advised by the Project Officer and relevant specialists, will select material for conservation. AS's Finds Officer, in conjunction with the Project Officer, will arrange for the specialists to view the finds for the purpose of report writing.

APPENDIX B
ARCHAEOLOGICAL SOLUTIONS LIMITED: PROFILES OF STAFF & SPECIALISTS

DIRECTOR Claire Halpin BA MIFA

Qualifications: Archaeology & History BA Hons (1974-77).
Oxford University Dept for External Studies In-Service Course (1979-1980).
Member of Institute of Field Archaeologists since 1985: IFA Council member (1989-1993)

Experience: Claire has 25 years' experience in field archaeology, working with the Oxford Archaeological Unit and English Heritage's Central Excavation Unit (now the Centre for Archaeology). She has directed several major excavations (e.g. Barrow Hills, Oxfordshire, and Irthlingborough Barrow Cemetery, Northants), and is the author of many excavation reports e.g. St Ebbe's, Oxford: *Oxoniensia* 49 (1984) and 54 (1989). Claire moved into the senior management of field archaeological projects with Hertfordshire Archaeological Trust (HAT) in 1990, and she was appointed Manager of HAT in 1996. From the mid 90s HAT has enlarged its staff complement and extended its range of skills. In July 2003 HAT was wound up and Archaeological Solutions was formed. The latter maintains the same staff complement and services as before. AS undertakes the full range of archaeological services nationwide.

DIRECTOR Tom McDonald MIFA

Qualifications: Member of the IFA

Experience: Tom has twenty years' experience in field archaeology, working for the North-Eastern Archaeological Unit (1984-1985), Buckinghamshire County Museum (1985), English Heritage (Stanwick Roman villa (1985-87) and Irthlingborough barrow excavations, Northamptonshire (1987)), and the Museum of London on the Royal Mint excavations (1986-7)., and as a Senior Archaeologist with the latter (1987-Dec 1990). Tom joined HAT at the start of 1991, directing several major multi-period excavations, including excavations in advance of the A41 Kings Langley and Berkhamsted bypasses, the A414 Cole Green bypass, and a substantial residential development at Thorley, Bishop's Stortford. He is the author of many excavation reports, exhibitions etc. Tom is AS's Health and Safety Officer and is responsible for site management, IT and CAD. He specialises in prehistoric and urban archaeology, and is a Lithics Specialist.

OFFICE MANAGER Rose Flowers

Experience: Rose has a very wide range of book-keeping skills developed over many years of employment with a range of companies, principally Rosier Distribution Ltd, Harlow (now part of Securicor) where she managed eight accounts staff. She has a good working knowledge of both accounting software and Microsoft Office.

SENIOR PROJECTS MANAGER Jon Murray BA MIFA

Qualifications: History with Landscape Archaeology BA Hons (1985-1988).

Experience: Jon has been employed by HAT (now AS) continually since 1989, attaining the position of Senior Projects Manager. Jon has conducted numerous archaeological investigations in a variety of situations, dealing with remains from all periods, throughout London and the South East, East Anglia, the South and Midlands. He is fluent in the execution of (and now project-manages) desk-based assessments/EIAs, historic building surveys (for instance the recording of the Royal Gunpowder Mills at Waltham Abbey prior to its rebirth as a visitor facility), earthwork and landscape surveys, all types of evaluations/excavations (urban and rural) and environmental archaeological investigation (working closely with Dr Rob Scaife), preparing many hundreds of archaeological reports dating back to 1992. Jon has also prepared numerous publications; in particular the nationally-important Saxon site at Gamlingay, Cambridgeshire (*Anglo-Saxon Studies in Archaeology & History*). Other projects published include Dean's Yard, Westminster (*Medieval Archaeology*), Brackley (*Northamptonshire Archaeology*), and a medieval cemetery in Haverhill he excavated in 1997 (*Proceedings of the Suffolk Institute of Archaeology).* Jon is a member of the senior management team, principally preparing specifications/tenders, co-ordinating

and managing the field teams. He also has extensive experience in preparing and supporting applications for Scheduled Monument Consent/Listed Building Consent

PROJECTS MANAGER (FIELD & ARCHIVES) Martin Brook BA

Qualifications: University of Leicester BA (Hons) Archaeology (2003 -2006)

Experience: Martin worked on archaeological excavations throughout his university career in and around Leicester including two seasons excavating a medieval abbey kitchen at Abbey Park, Leicester with ULAS. He specialised in Iron Age funeral traditions and grave goods for his 3rd year dissertation advancing his skills in museum research, database use and academic correspondence. He joined AS in September 2006 as an excavator involved in projects such as Earsham Bronze Age Barrow and cremation site. From May 2007, Martin has moved across to the Post-Excavation team to become Assistant Archives Officer, and thereafter Martin has returned to fieldwork as a Supervisor before being promoted to project management in 2009

PROJECT OFFICER Zbigniew Pozorski MA

Qualifications: University of Wroclaw, Poland, Archaeology (1995-2000, MA 2003)

Experience: Zbigniew has archaeological experience dating from 1995 when as a student he joined an academic group of excavators. He was involved in numerous archaeological projects throughout the Lower Silesia region in southwest Poland and a number of projects in old town of Wroclaw. During his university years he specialized in medieval urban archaeology. He had his own research project working on an early/high medieval stronghold in Pietrzykow. He was a member of a University team which located and excavated an unknown high medieval castle in Wierzbna, Poland. Zbigniew has worked for archaeological contractors in Poland on several projects as a supervisor where he gained experience in all types of evaluations and excavations in urban and rural areas. Recently he worked in Ireland where he completed two large long-term projects for Headland Archaeology Ltd. He joined AS in January 2008 as a Project Officer.

SUPERVISOR Gareth Barlow MSc

Qualifications: University of Sheffield, MSc Environmental Archaeology & Palaeoeconomy (2002-2003)

King Alfred's College, Winchester, Archaeology BA (Hons) (1999-2002)

Experience: Gareth worked on a number of excavations in Cambridgeshire before pursuing his degree studies, and worked on many archaeological projects across the UK during his university days. Gareth joined AS in 2003 and has worked on numerous archaeological projects throughout the South East and East Anglia with AS. Gareth was promoted to Supervisor in the Summer 2007.

PROJECT OFFICER (DESK-BASED ASSESSMENTS) Kate Higgs MA (Oxon)

Qualifications: University of Oxford, St Hilda's College
Archaeology & Anthropology MA (Oxon) (2001-2004)

Experience: Kate has archaeological experience dating from 1999, having taken part in clearance, surveying and recording of stone circles in the Penwith area of Cornwall. During the same period, she also assisted in compiling a database of archaeological and anthropological artefacts from Papua New Guinea, which were held in Scottish museums. Kate has varied archaeological experience from her years at Oxford University, including participating in excavations at a Roman amphitheatre and an early church at Marcham/ Frilford in Oxfordshire, with the Bamburgh Castle Research Project in Northumberland, which also entailed the excavation of human remains at a Saxon cemetery, and also excavating, recording and drawing a Neolithic chambered tomb at Prissé, France. Kate has also worked in the environmental laboratory at the Museum of Natural History in Oxford, and as a finds processor for Oxford's Institute of Archaeology. Since joining AS in November 2004, Kate has researched and authored a variety of reports, concentrating on desk-based assessments in advance of archaeological work and historic building recording.

ASSISTANT PROJECTS MANAGER (POST-EXCAVATION) Andrew Newton MPhil PIFA

Qualifications: University of Bradford, MPhil (2002-04)
University of Bradford, BSc (Hons) Archaeology (1998-2002)
University of Bradford, Dip Professional Archaeological Studies (2002)

Experience: Andrew has carried out geophysical surveys for GeoQuest Associates on sites throughout the UK and has worked as a site assistant with BUFAU. During 2001 he worked as a researcher for the Yorkshire Dales Hunter-Gatherer Research Project, a University of Bradford and Michigan State University joint research programme, and has carried out voluntary work with the curatorial staff at Beamish Museum in County Durham. Andrew is a member of the Society of Antiquaries of Newcastle-upon-Tyne and a Practitioner Member of the Institute for Archaeologists. Since joining AS in early Summer 2005, as a Project Officer writing desk-based assessments, Andrew has gained considerable experience in post-excavation work. His principal role with AS is conducting post-excavation research and authoring site reports for publication. Significant post-excavation projects Andrew has been responsible for include the Ingham Quarry Extension, Fornham St. Genevieve, Suffolk – a site with large Iron Age pit clusters arranged around a possible wetland area; the late Bronze Age to early Iron Age enclosure and early Saxon cremation cemetery at the Chalet Site, Heybridge, Essex; and, Church Street, St Neots, Cambridgeshire, an excavation which identified the continuation of the Saxon settlement previously investigated by Peter Addyman in the 1960s. Andrew also writes and co-ordinates Environmental Impact Assessments and has worked on a variety of such projects across southern and eastern England. In addition to his research responsibilities Andrew undertakes outreach and publicity work and carries out some fieldwork.

PROJECT OFFICER (POST-EXCAVATION) Antony Mustchin BSc MSc DipPAS

Qualifications: University of Bradford BSc (Hons) Bioarchaeology (1999-2003)
University of Bradford MSc Biological Archaeology (2004-2005)
University of Bradford Diploma in Professional Archaeological Studies (2003)

Experience: Antony has 13 years' experience in field archaeology, gained during his higher education and in the professional sector. Commercially in the UK, Antony has worked for Archaeology South East (2003), York Archaeological Trust (2004) and Special Archaeological Services (2003). He has also undertaken a six-month professional placement as Assistant SMR Officer/ Development Control Officer with Kent County Council (2001-2002). Antony is part-way through writing up a PhD on Viking Age demographics, a long-term academic interest that has led to his gaining considerable research excavation experience across the North Atlantic. He has worked for projects and organisations including the Old Scatness & Jarlshof Environs Project, Shetland (2000-2003), the Viking Unst Project, Shetland (2006-2007), the Heart of the Atlantic Project/ Føroya Fornminnissavn, Faroe Islands (2006-2008) and City University New York/ National Museum of Denmark/ Greenland National Museum and Archives, Greenland (2006 & 2010). Shortly before Joining Archaeological Solutions in November 2011, Antony spent three years working for the Independent Commission for the Location of Victims Remains, assisting in the search for and forensic recovery of "the remains of victims of paramilitary violence ("The Disappeared") who were murdered and buried in secret arising from the conflict in Northern Ireland". Antony has a broad experience of fieldwork and post-excavation practice including specialist (archaeofauna), teaching, supervisory and directing-level posts.

POTTERY, LITHICS AND CBM RESEARCHER Andrew Peachey BA MIFA

Qualifications: University of Reading BA Hons, Archaeology and History (1998-2001)

Experience: Andrew joined AS (formerly HAT) in 2002 as a pottery researcher, and rapidly expanded into researching CBM and lithics. Andrew specialises in prehistoric and Roman pottery and has worked on numerous substantial assemblages, principally from across East Anglia but also from southern England. Recent projects have included a Neolithic site at Coxford, Norfolk, an early Bronze Age domestic site at Shropham, Norfolk, late Bronze Age material from Panshanger, Hertfordshire, middle Iron Age pit clusters at Ingham, Suffolk and an Iron Age and early Roman riverside site at Dernford, Cambridgshire. Andrew has worked on important Roman kiln

assemblages, including a Nar Valley ware production site at East Winch Norfolk, a face-pot producing kiln at Hadham, Hertfordshire and is currently researching early Roman Horningsea ware kilns at Waterbeach, Cambridgeshire. Andrew is an enthusiastic member of the Study Group for Roman Pottery, and also undertakes pottery and lithics analysis as an 'external' specialist for a range of archaeological units and local societies in the south of England.

POTTERY RESEARCHER Peter Thompson MA

Qualifications: University of Bristol BA (Hons), Archaeology (1995-1998)
University of Bristol MA; Landscape Archaeology (1998- 1999)

Experience: As a student, Peter participated in a number of projects, including the excavation of a Cistercian monastery cemetery in Gascony and surveying an Iron Age promontory hillfort in Somerset. Peter has two years excavation experience with the Bath Archaeological Trust and Bristol and Region Archaeological Services which includes working on a medieval manor house and a post-medieval glass furnace site of national importance. Peter joined HAT (now AS) in 2002 to specialise in Iron Age, Saxon and Medieval pottery research and has also produced desk-based assessments. Pottery reports include an early Iron pit assemblage and three complete Early Anglo-Saxon accessory vessels from a cemetery in Dartford, Kent.

PROJECT OFFICER (OSTEOARCHAEOLOGY) Dr Julia Cussans

Qualifications: University of Bradford, PhD (2002-2010)
University of Bradford, BSc (Hons) Bioarchaeology (1997-2001)
University of Bradford, Dip. Professional Archaeological Studies (2001)

Experience: Julia has c. 12 years of archaeozoological experience. Whilst undertaking her part time PhD she also worked as a specialist on a variety of projects in northern Britain including Old Scatness (Shetland), Broxmouth Iron Age Hillfort and Binchester Roman Fort. Additionally Julia has extensive field experience and has held lead roles in excavations in Shetland and the Faroe Islands including, Old Scatness, a large multi-period settlement centred on an Iron Age Broch; the Viking Unst Project, an examination of Viking and Norse houses on Britain's most northerly isle; the Laggan Tormore Pipeline (Firths Voe), a Neolithic house site in Shetland; the Heart of the Atlantic Project, an examination of Viking settlement in the Faroes and Við Kirkjugarð, an early Viking site on Sanday, Faroe Islands. Early on in her career Julia also excavated at Sedgeford, Norfolk as part of SHARP and in Pompeii, Italy as part of the Anglo-American Project in Pompeii. Since joining AS in October 2011 Julia has worked on animal bone assemblages from Beck Row, a Roman villa site at Mildenhall, Suffolk and Sawtry, an Iron Age, fen edge site in Cambridgeshire. Julia is a full and active member of the International Council for Archaeozoology, the Professional Zooarchaeology Group and the Association for Environmental Archaeology.

ENVIRONMENTAL ARCHAEOLOGIST Dr John Summers

Qualifications: 2006-2010: PhD "The Architecture of Food" (University of Bradford)
2005-2006: MSc Biological Archaeology (University of Bradford)
2001-2005: BSc Hons. Bioarchaeology (University of Bradford)

Experience: John is an archaeobotanist with a primary specialism in the analysis of carbonised plant macrofossils and charcoal. Prior to joining Archaeological Solutions, John worked primarily in Atlantic Scotland. His research interests involve using archaeobotanical data in combination with other archaeological and palaeoeconomic information to address cultural and economic research questions. John has made contributions to a number of large research projects in Atlantic Scotland, including the Old Scatness and Jarlshof Environs Project (University of Bradford), the Viking Unst Project (University of Bradford) and publication work for Bornais Mound 1 and Mound 2 (Cardiff University). He has also worked with plant remains from Thruxton Roman Villa, Hampshire, as part of the Danebury Roman Environs Project (Oxford University/ English Heritage). John's role at AS is to analyse and report on assemblages of plant macro-remains from environmental samples and provide support and advice regarding environmental sampling regimes and sample processing. John is a member of the Association for Environmental Archaeology.

SENIOR GRAPHICS OFFICER Kathren Henry

Experience: Kathren has twenty-five years' experience in archaeology, working as a planning supervisor on sites from prehistoric to late medieval date, including urban sites in London and rural sites in France/Italy, working for the Greater Manchester Archaeological Unit, Passmore Edwards Museum, DGLA and Central Excavation Unit of English Heritage (at Stanwick and Irthlingborough, Northamptonshire). She has worked with AS (formerly HAT) since 1992, becoming Senior Graphics Officer. Kathren is AS's principal photographer, specializing in historic building survey, and she manages AS's photographic equipment and dark room. She is in charge of AS's Graphics Department, managing computerised artwork and report production. Kathren is also the principal historic building surveyor/illustrator, producing on-site and off-site plans, elevations and sections.

HISTORIC BUILDING RECORDING Tansy Collins BSc

Qualifications: University of Sheffield, Archaeological Sciences BSc (Hons) (1999-2002)

Experience: Tansy's archaeological experience has been gained on diverse sites throughout England, Ireland, Scotland and Wales. Tansy joined AS in 2004 where she developed skills in graphics, backed by her grasp of archaeological interpretation and on-site experience, to produce hand drawn illustrations of pottery, and digital illustrations using a variety of packages such as AutoCAD, Corel Draw and Adobe Illustrator. She joined the historic buildings team in 2005 in order to carry out both drawn and photographic surveys of historic buildings before combining these skills with authoring historic building reports in 2006. Since then Tansy has authored numerous such reports for a wide range of building types; from vernacular to domestic architecture, both timber-framed and brick built with date ranges varying from the medieval period to the 20th century. These projects include a number of regionally and nationally significant buildings, for example a previously unrecognised medieval aisled barn belonging to a small group of nationally important agricultural buildings, one of the earliest surviving domestic timber-framed houses in Hertfordshire, and a Cambridgeshire house retaining formerly hidden 17th century decorative paint schemes. Larger projects include The King Edward VII Sanatorium in Sussex, RAF Bentley Priory in London as well as the Grade I Listed Balls Park mansion in Hertfordshire.

HISTORIC BUILDING RECORDING Lisa Smith BA

Qualifications: University of York, BA Archaeology (1998-2001)

Experience: Lisa has nine years archaeological experience undertaken mainly in the north of England previously working as a senior site assistant for Field Archaeology Specialists in York on both rural and urban sites as well as Castle Sinclair Girnigoe and Tarbat in Scotland. Prior to working for FAS Lisa was involved in various excavation projects for Oxford Archaeology North and Archaeological Services, University of Durham. Lisa joined AS as a supervisor in January 2008 and in November 2009 transferred to historic building recording and has since worked on a variety of buildings dating from the medieval period onwards, working closely with external consultant Dr Lee Prosser.

GRAPHICS OFFICER Rosanna Price BSc

Qualifications: University of Kent, Medical Anthropology BSc (Hons) (2005 - 2008)

Experience: Rosanna's interests have always revolved around art and human history, and she has combined these throughout her work and education. During her degree she specialised in Osteoarchaeology and Palaeopathology, and personally instigated the University's photographic database of human remains. This experience gained her the post of Osteoarchaeologist at Kent Osteological Research and Analysis in early 2009, where she worked on a number of human bone collections including the Thanet Earth Skeletons. In January 2010 she joined AS as a Finds and Archives assistant, and by the summer had achieved a new role as graphics officer. In her current position Rosanna uses a range of computer programmes, such as AutoCAD, Adobe Illustrator and CorelDraw to produce digital figures and finds illustrations. These accompany a wide range of archaeological reports, from desk-based assessments and interim reports through to publication standard.

GRAPHICS OFFICER Charlotte Davies BA

Qualifications: University of Exeter, Archaeology BA (Hons) (2004-2007)
Surrey Institute of Art & Design, BTEC Foundation Diploma in Art & Design (2003-2004)
University of Cambridge, Archaeology (Heritage & Museum Studies) MPhil (2010-2011).

Experience: Charlotte has always had a passionate interest in art and archaeology, and has combined these interests in her higher education. Charlotte worked on archaeological excavations in South Dakota, USA, before joining AS in 2007 as part of the graphics team. Charlotte's role within AS comprises the production of a wide range of high quality figures and illustrations for reports, from desk-based assessments and interim reports through to publication. Charlotte became a member of the Association of Archaeological Illustrators and Surveyors in 2009 (this subsequently became incorporated into the Institute for Archaeologists), and in 2010 undertook a masters degree in archaeology at the University of Cambridge.

ARCHAEOLOGICAL SOLUTIONS: PRINCIPAL SPECIALISTS

GEOPHYSICAL SURVEYS	Stratascan Ltd/Archaeological Surveys
AIR PHOTOGRAPHIC ASSESSMENTS	Air Photo Services
PHOTOGRAPHIC SURVEYS	Ms K Henry
PREHISTORIC POTTERY	Mr A Peachey
ROMAN POTTERY	Mr A Peachey
SAXON & MEDIEVAL POTTERY	Mr P Thompson
POST-MEDIEVAL POTTERY	Mr P Thompson
FLINT	Mr A Peachey
GLASS	H Cool
COINS	British Museum, Dept of Coins & Medals
METALWORK & LEATHER	Ms Q Mould, Ms N Crummy
SLAG	Ms J Cowgill
ANIMAL BONE	Dr J Cussans
HUMAN BONE:	Ms J Curl
ENVIRONMENTAL CO-ORDINATOR	Dr R Scaife
POLLEN AND SEEDS:	Dr R Scaife
CHARCOAL/WOOD	Dr J Summers
SOIL MICROMORPHOLOGY	Dr R MacPhail, Dr C French
CARBON-14 DATING:	English Heritage Ancient Monuments Laboratory (for advice).
CONSERVATION	University of Leicester

APPENDIX 4 GEOPHYSICAL SURVEY REPORT

STRATASCAN

Geophysical Survey Report

Land South of Burwell Road, Exning

for

Archaeological Solutions

November 2012

Job ref.J3205

Richard Smalley BA (Hons) AIFA

Document Title:	**Geophysical Survey Report** **Land South of Burwell Road, Exning**
Client:	**Archaeological Solutions**
Stratascan Job No:	**J3205**
Techniques:	**Detailed magnetic survey (gradiometry)**
National Grid Ref:	**TL 613 656**
Post Code:	**CB8 7DU** **County Historic Environment Record Number: EXG 100**

Field Team:	**Adam Cooper MSc. Tom Desalle MSc and Robert Knight**
Project Manager:	**Simon Haddrell B.Eng (Hons) AMBCS PIFA**
Report written by:	**Richard Smalley BA (Hons) AIFA**
CAD illustration by:	**Richard Smalley BA (Hons) AIFA**
Checked by:	**Peter Barker C.Eng MICE MCIWEM MIFA FCInstCES**

Stratascan Ltd.

Vineyard House
Upper Hook Road
Upton upon Severn
WR8 0SA
Tel: 01684 592266
Fax: 01684 594142
Email: ppb@stratascan.co.uk
www.stratascan.co.uk

LIST OF FIGURES

1 SUMMARY OF RESULTS

The geophysical survey undertaken over approximately 6ha of agricultural land near Exning, Suffolk has not identified any anomalies that can be confidently attributed as being of an archaeological origin. However, a number of anomalies of a possible archaeological origin, including three large circular features, are evident within the survey data.

2 INTRODUCTION

2.1 Background synopsis

Stratascan were commissioned to undertake a geophysical survey of an area outlined for development. This survey forms part of an archaeological investigation being undertaken by Archaeological Solutions.

2.2 Site location

The site is located on the western limits of Exning, near Newmarket, Suffolk at OS ref. TL 613 656.

2.3 Description of site

The survey area comprises approximately 6ha of flat, ploughed arable land south of Burwell Road, Exning.

2.4 Geology and soils

The underlying geology is chalk (British Geological Survey South Sheet, Fifth Edition Solid, 2007). No drift geology is recorded for the site (British Geological Survey South Sheet, First Edition Quaternary, 1977).

The overlying soils are known as Swaffham Prior which are typical brown calcareous earths. These consist of well drained calcareous coarse and fine loamy soils over chalk rubble (Soil Survey of England and Wales, Sheet 4 Eastern England).

2.5 Site history and archaeological potential

The following is an extract from a Brief for a Geophysical Survey issued by Suffolk County Council (Tipper, 2012):

"Although there are currently no known heritage assets within the proposed site, this area has not been the subject of any systematic archaeological study. A large scatter of both prehistoric, Roman and medieval metalwork, indicative of further occupation deposits, is recorded in the Suffolk Historic Environment Record (HER no. EXG 051) to the south in a similar topographic setting.

The potential for below-ground archaeological remains, combined with the large size of the site and the topographic location, indicates that there is potential for archaeological remains to be defined within the application site, which has not been the subject of any previous systematic investigation."

2.6 Survey objectives

The objective of the survey was to locate any features of a possible archaeological origin in order that they may be assessed prior to development.

2.7 Survey methods

Detailed magnetic survey (gradiometry) was used as an efficient and effective method of locating archaeological anomalies. More information regarding this technique is included in the Methodology section below.

3 METHODOLOGY

3.1 Date of fieldwork

The fieldwork was carried out over two days from the 11th October 2012. Weather conditions during the survey were overcast.

3.2 Grid locations

The location of the survey grids has been plotted in Figure 2 together with the referencing information. Grids were set out using a Leica Smart Rover RTK GPS.

An RTK GPS (Real-time Kinematic Global Positioning System) can locate a point on the ground to a far greater accuracy than a standard GPS unit. A standard GPS suffers from errors created by satellite orbit errors, clock errors and atmospheric interference, resulting in an accuracy of 5m-10m. An RTK system uses a single base station receiver and a number of mobile units. The base station re-broadcasts the phase of the carrier it measured, and the mobile units compare their own phase measurements with those they received from the base station. A SmartNet RTK GPS uses Ordnance Survey's network of over 100 fixed base stations to give an accuracy of around 0.01m.

3.3 Survey equipment and gradiometer configuration

Although the changes in the magnetic field resulting from differing features in the soil are usually weak, changes as small as 0.2 nanoTeslas (nT) in an overall field strength of 48,000nT, can be accurately detected using an appropriate instrument.

The mapping of the anomaly in a systematic manner will allow an estimate of the type of material present beneath the surface. Strong magnetic anomalies will be generated by buried iron-based objects or by kilns or hearths. More subtle anomalies such as pits and ditches can be seen if they contain more humic material which is normally rich in magnetic iron oxides when compared with the subsoil.

To illustrate this point, the cutting and subsequent silting or backfilling of a ditch may result in a larger volume of weakly magnetic material being accumulated in the trench compared to the undisturbed subsoil. A weak magnetic anomaly should therefore appear in plan along the line of the ditch.

The magnetic survey was carried out using a dual sensor Grad601-2 Magnetic Gradiometer manufactured by Bartington Instruments Ltd. The instrument consists of two fluxgates very accurately aligned to nullify the effects of the Earth's magnetic field. Readings relate to the difference in localised magnetic anomalies compared with the general magnetic background. The Grad601-2 consists of two high stability fluxgate gradiometers suspended on a single frame. Each gradiometer has a 1m separation between the sensing elements so enhancing the response to weak anomalies.

3.4 Sampling interval, depth of scan, resolution and data capture

3.4.1 Sampling interval

Readings were taken at 0.25m centres along traverses 1m apart. This equates to 3600 sampling points in a full 30m x 30m grid.

3.4.2 Depth of scan and resolution

The Grad 601-2 has a typical depth of penetration of 0.5m to 1.0m, though strongly magnetic objects may be visible at greater depths. The collection of data at 0.25m centres provides an optimum methodology for the task balancing cost and time with resolution.

3.4.3 Data capture

The readings are logged consecutively into the data logger which in turn is daily down-loaded into a portable computer whilst on site. At the end of each site survey, data is transferred to the office for processing and presentation.

3.5 Processing, presentation of results and interpretation

3.5.1 Processing

Processing is performed using specialist software. This can emphasise various aspects contained within the data but which are often not easily seen in the raw data. Basic processing of the magnetic data involves 'flattening' the background levels with respect to adjacent traverses and adjacent grids. Once the basic processing has flattened the background it is then possible to carry out further processing which may include low pass filtering to reduce 'noise' in the data and hence emphasise the archaeological or man-made anomalies.

The following schedule shows the basic processing carried out on all processed gradiometer data used in this report:

1. *Destripe* (Removes striping effects caused by zero-point discrepancies between different sensors and walking directions)

2. *Destagger* (Removes zigzag effects caused by inconsistent walking speeds on sloping, uneven or overgrown terrain)

3.5.2 Presentation of results and interpretation

The presentation of the data for each site involves a print-out of the minimally processed data both as a greyscale plot and a colour plot showing extreme magnetic values. Magnetic anomalies have been identified and plotted onto the 'Abstraction and Interpretation of Anomalies' drawing for the site.

4 RESULTS

The detailed magnetic gradiometer survey undertaken over 6ha of agricultural land west of Exning has identified a number of anomalies that have been characterised as being of a *possible* archaeological origin.

The difference between *probable* and *possible* archaeological origin is a confidence rating. Features identified within the data set that form recognisable archaeological patterns or seem to be related to a deliberate historical act have been interpreted as being of a probable archaeological origin. Features of possible archaeological origin tend to be more amorphous anomalies which may have similar magnetic attributes in terms of strength or polarity but are difficult to classify as being archaeological or natural.

The following list of numbered anomalies refers to numerical labels on the interpretation plots.

Probable Archaeology

No anomalies have been identified that can be confidently attributed as being of an archaeological origin.

Possible Archaeology

1. A number of positive linear and area anomalies can be noted throughout the survey area. These anomalies may be related to cut features, such as pits and ditches, of an archaeological origin. However their amorphous nature means that a natural origin cannot be ruled out at this stage.

Two large circular anomalies (**1a**) are evident in the central and eastern region of the site. These features measure approximately 35m in diameter and may be related to circular enclosures of an archaeological origin. However their very weak magnetic value makes it difficult to interpret them confidently. As a result they have been attributed as being of a *possible* as opposed to *probable* archaeological origin.

2. A large circular negative anomaly can be noted in the western region of the survey area. This anomaly is similar to those annotated as 1a above. However this feature seems to have been comprised of an earthwork as opposed to a ditch.

3. Magnetic ‘spikes’ (strong focussed values with associated antipolar response) indicate ferrous metal objects. Although most of these are likely to be modern debris, some may be of archaeological interest. Particular attention may be paid to those found in association with other potentially archaeological anomalies.

Other Anomalies

4. Two swathes of magnetic variation are evident within the survey data. These anomalies have been interpreted as being of a pedological or geological origin.

5. These close centred linear anomalies have been interpreted as being related to modern plough activity.

6. Linear anomalies have been identified along the northern and eastern perimeter of the survey area. These features are related to deep vehicle tracks present in these areas at the time of survey.

7. These small areas of magnetic disturbance are likely to be related to spreads of ferrous debris.

8. Areas of magnetic disturbance are the result of substantial nearby ferrous metal objects such as fences and underground services. These effects can mask weaker archaeological anomalies, but on this site have not affected a significant proportion of the area.

5 CONCLUSION

The detailed magnetic gradiometer survey undertaken over 6ha of land south of Burwell Road has identified three large circular features which may be related to archaeological enclosures or monuments. These anomalies are very weak in magnetic value however, which makes it difficult to interpret them with confidence.

6 REFERENCES

British Geological Survey South Sheet, 1977. *Geological Survey Ten Mile Map, South Sheet First Edition* (*Quaternary).* Institute of Geological Sciences.

British Geological Survey, 2007. *Geological Survey Ten Mile Map, South Sheet, Fifth Edition (Solid)*. British Geological Society.

Soil Survey of England and Wales, 1983. *Soils of England and Wales, Sheet 3 Eastern England*.

Tipper, J. (2012) *Brief for a Geophysical Survey at Land South of Burwell Road, Exning*. Suffolk County Council.

APPENDIX A – Basic principles of magnetic survey

Detailed magnetic survey can be used to effectively define areas of past human activity by mapping spatial variation and contrast in the magnetic properties of soil, subsoil and bedrock.

Weakly magnetic iron minerals are always present within the soil and areas of enhancement relate to increases in *magnetic susceptibility* and permanently magnetised *thermoremanent* material.

Magnetic susceptibility relates to the induced magnetism of a material when in the presence of a magnetic field. This magnetism can be considered as effectively permanent as it exists within the Earth's magnetic field. Magnetic susceptibility can become enhanced due to burning and complex biological or fermentation processes.

Thermoremanence is a permanent magnetism acquired by iron minerals that, after heating to a specific temperature known as the Curie Point, are effectively demagnetised followed by re-magnetisation by the Earth's magnetic field on cooling. Thermoremanent archaeological features can include hearths and kilns and material such as brick and tile may be magnetised through the same process.

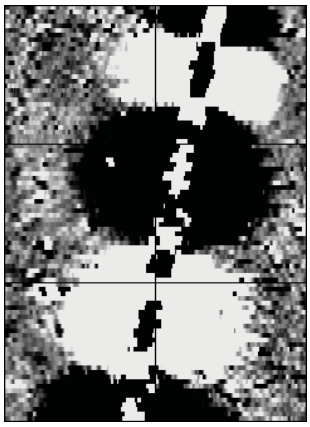
Silting and deliberate infilling of ditches and pits with magnetically enhanced soil creates a relative contrast against the much lower levels of magnetism within the subsoil into which the feature is cut. Systematic mapping of magnetic anomalies will produce linear and discrete areas of enhancement allowing assessment and characterisation of subsurface features. Material such as subsoil and non-magnetic bedrock used to create former earthworks and walls may be mapped as areas of lower enhancement compared to surrounding soils.

Magnetic survey is carried out using a fluxgate gradiometer which is a passive instrument consisting of two sensors mounted vertically either 0.5 or 1m apart. The instrument is carried about 30cm above the ground surface and the top sensor measures the Earth's magnetic field whilst the lower sensor measures the same field but is also more affected by any localised buried field. The difference between the two sensors will relate to the strength of a magnetic field created by a buried feature, if no field is present the difference will be close to zero as the magnetic field measured by both sensors will be the same.

Factors affecting the magnetic survey may include soil type, local geology, previous human activity, disturbance from modern services etc.

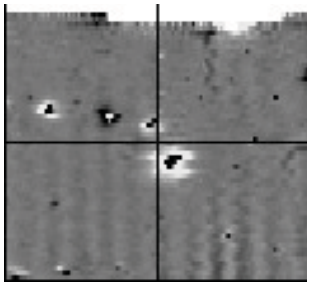
APPENDIX B – Glossary of magnetic anomalies

Bipolar



A bipolar anomaly is one that is composed of both a positive response and a negative response. It can be made up of any number of positive responses and negative responses. For example a pipeline consisting of alternating positive and negative anomalies is said to be bipolar. See also dipolar which has only one area of each polarity. The interpretation of the anomaly will depend on the magnitude of the magnetic field strength. A weak response may be caused by a clay field drain while a strong response will probably be caused by a metallic service.

Dipolar

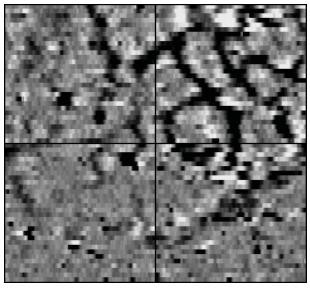


This consists of a single positive anomaly with an associated negative response. There should be no separation between the two polarities of response. These responses will be created by a single feature. The interpretation of the anomaly will depend on the magnitude of the magnetic measurements. A very strong anomaly is likely to be caused by a ferrous object.

Positive anomaly with associated negative response

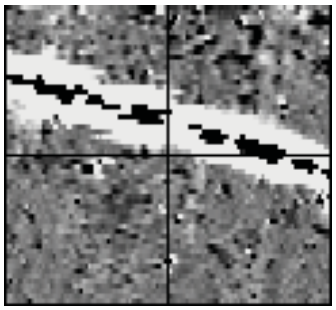
See bipolar and dipolar.

Positive linear



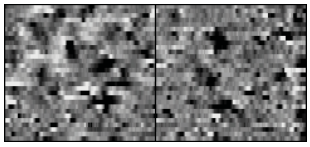
A linear response which is entirely positive in polarity. These are usually related to in-filled cut features where the fill material is magnetically enhanced compared to the surrounding matrix. They can be caused by ditches of an archaeological origin, but also former field boundaries, ploughing activity and some may even have a natural origin.

Positive linear anomaly with associated negative response



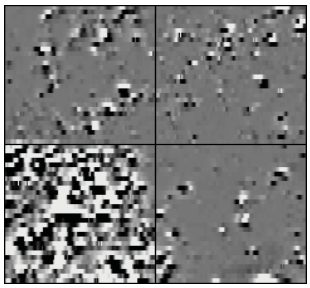
A positive linear anomaly which has a negative anomaly located adjacently. This will be caused by a single feature. In the example shown this is likely to be a single length of wire/cable probably relating to a modern service. Magnetically weaker responses may relate to earthwork style features and field boundaries.

Positive point/area



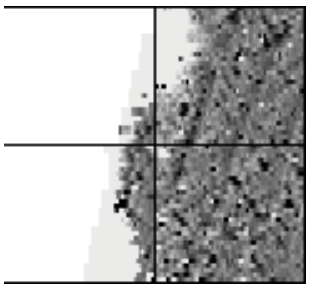
These are generally spatially small responses, perhaps covering just 3 or 4 reading nodes. They are entirely positive in polarity. Similar to positive linear anomalies they are generally caused by in-filled cut features. These include pits of an archaeological origin, possible tree bowls or other naturally occurring depressions in the ground.

Magnetic debris



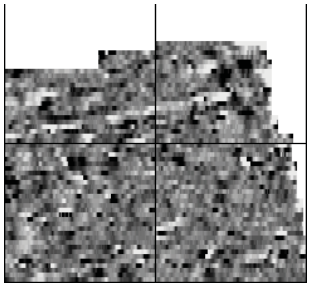
Magnetic debris consists of numerous dipolar responses spread over an area. If the amplitude of response is low (+/-3nT) then the origin is likely to represent general ground disturbance with no clear cause, it may be related to something as simple as an area of dug or mixed earth. A stronger anomaly (+/-250nT) is more indicative of a spread of ferrous debris. Moderately strong anomalies may be the result of a spread of thermoremanent material such as bricks or ash.

Magnetic disturbance



Magnetic disturbance is high amplitude and can be composed of either a bipolar anomaly, or a single polarity response. It is essentially associated with magnetic interference from modern ferrous structures such as fencing, vehicles or buildings, and as a result is commonly found around the perimeter of a site near to boundary fences.

Negative linear

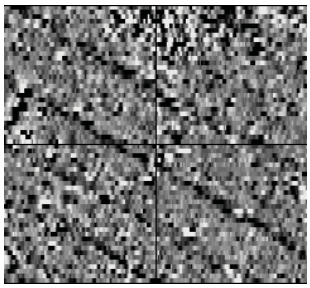


A linear response which is entirely negative in polarity. These are generally caused by earthen banks where material with a lower magnetic magnitude relative the background top soil is built up. See also ploughing activity.

Negative point/area

Opposite to positive point anomalies these responses may be caused by raised areas or earthen banks. These could be of an archaeological origin or may have a natural origin.

Ploughing activity



Ploughing activity can often be visualised by a series of parallel linear anomalies. These can be of either positive polarity or negative polarity depending on site specifics. It can be difficult to distinguish between ancient ploughing and more modern ploughing, clues such as the separation of each linear, straightness, strength of response and cross cutting relationships can be used to aid this, although none of these can be guaranteed to differentiate between different phases of activity.

Polarity

Term used to describe the measurement of the magnetic response. An anomaly can have a positive polarity (values above 0nT) and/or a negative polarity (values below 0nT).

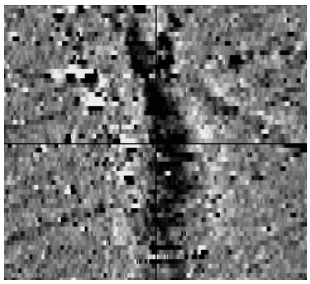
Strength of response

The amplitude of a magnetic response is an important factor in assigning an interpretation to a particular anomaly. For example a positive anomaly covering a $10m^2$ area may have values up to around 3000nT, in which case it is likely to be caused by modern magnetic interference. However, the same size and shaped anomaly but with values up to only 4nT may have a natural origin. Colour plots are used to show the amplitude of response.

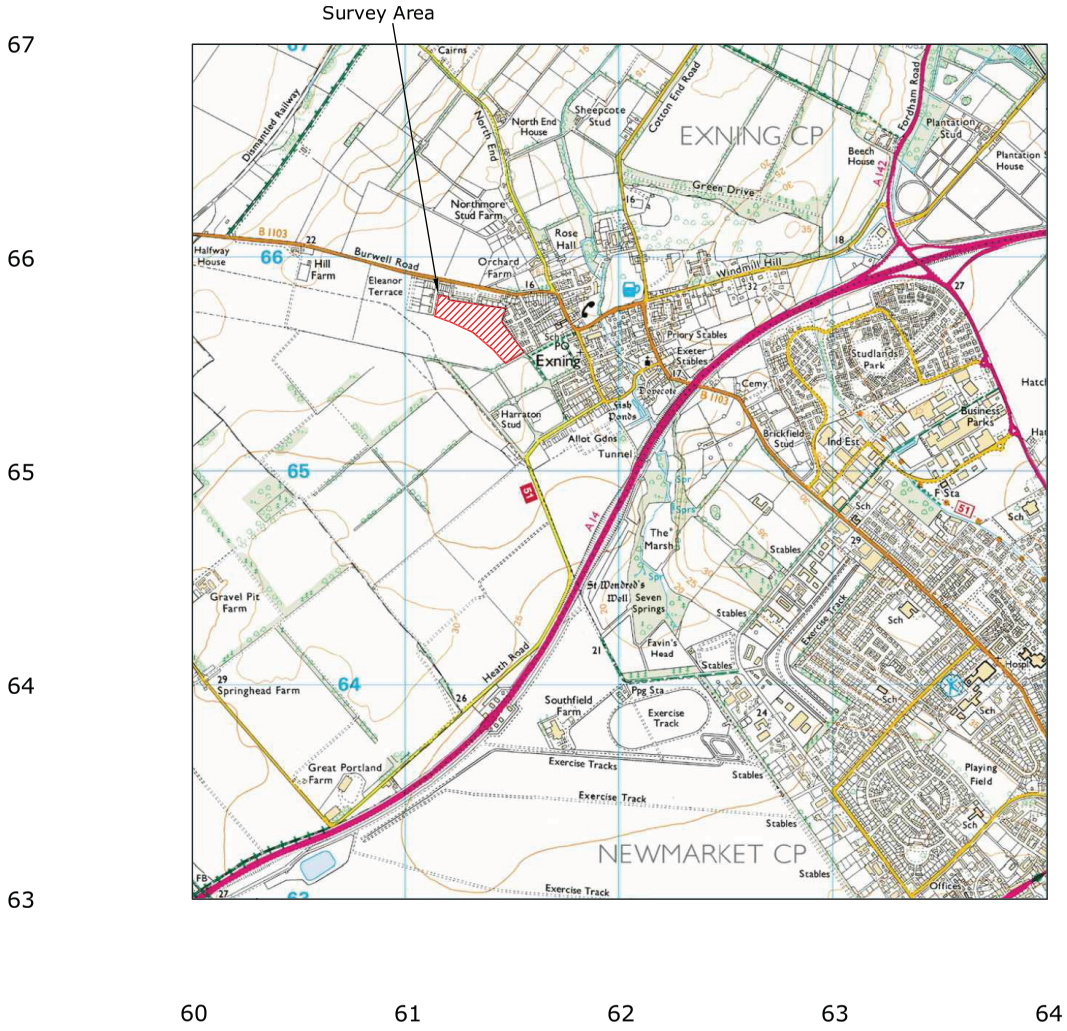
Thermoremanent response

A feature which has been subject to heat may result in it acquiring a magnetic field. This can be anything up to approximately +/-100 nT in value. These features include clay fired drains, brick, bonfires, kilns, hearths and even pottery. If the heat application has occurred in situ (e.g. a kiln) then the response is likely to be bipolar compared to if the heated objects have been disturbed and moved relative to each other, in which case they are more likely to take an irregular form and may display a debris style response (e.g. ash).

Weak background variations



Weakly magnetic wide scale variations within the data can sometimes be seen within sites. These usually have no specific structure but can often appear curvy and sinuous in form. They are likely to be the result of natural features, such as soil creep, dried up (or seasonal) streams. They can also be caused by changes in the underlying geology or soil type which may contain unpredictable distributions of magnetic minerals, and are usually apparent in several locations across a site.



Amendments		
Issue No.	Date	Description
-	-	-
-	-	-

Site centred on NGR TL 613 656

Client
ARCHAEOLOGICAL SOLUTIONS

Project Title Job No. 3205
GEOPHYSICAL SURVEY - LAND SOUTH OF BURWELL ROAD, EXNING

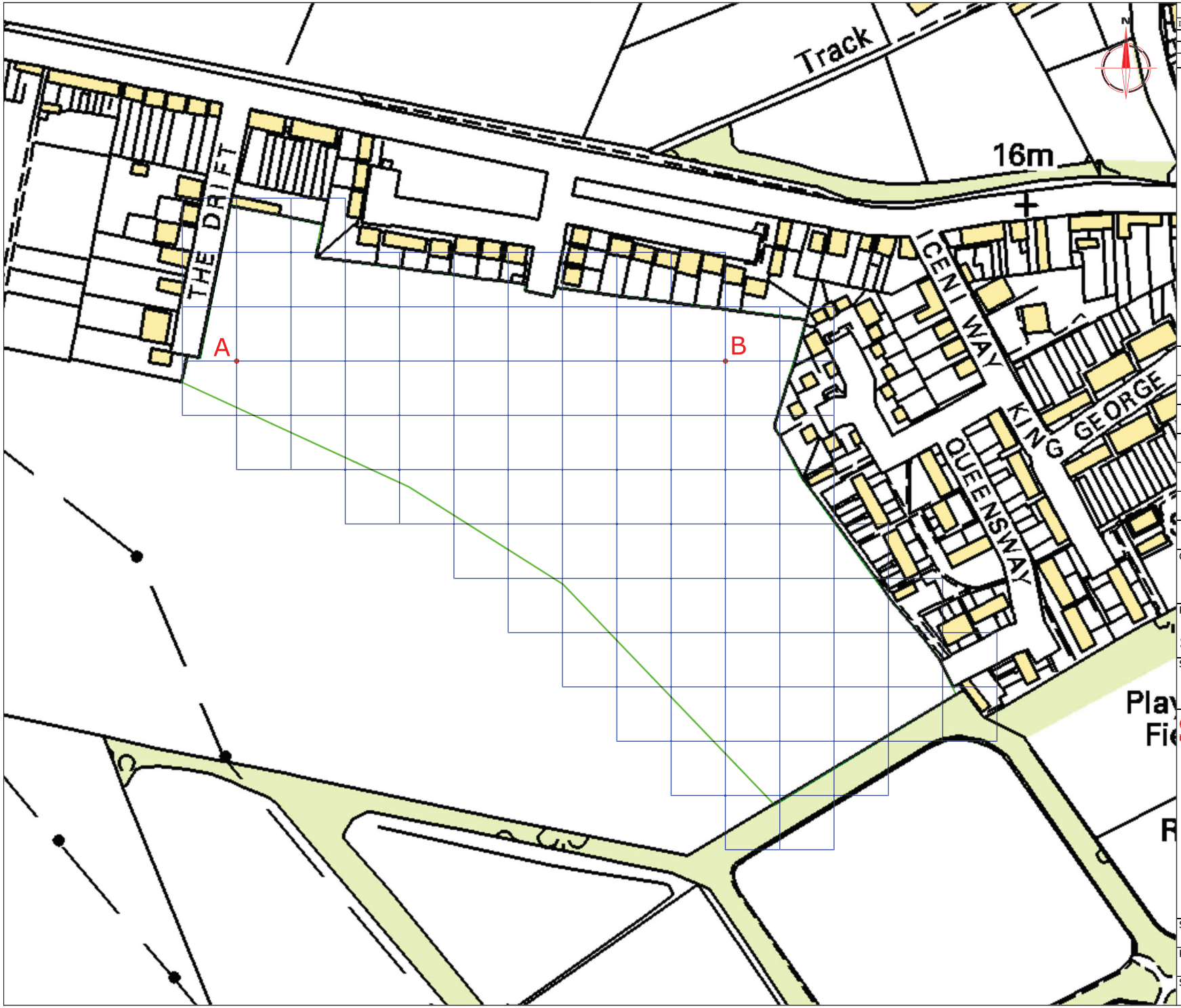
Subject
LOCATION PLAN OF SURVEY AREA

STRATASCAN™
GEOPHYSICS FOR ARCHAEOLOGY AND ENGINEERING
VINEYARD HOUSE
UPTON UPON SEVERN
WR8 0SA
T: 01684 592266
E: info@stratascan.co.uk
www.stratascan.co.uk

SUMO GROUP MEMBER

Scale 1:25000 (0m 500 1000m)

Plot	Checked by	Issue No.
A3	PPB	01
Survey date	Drawn by	Figure No.
OCT 2012	RAJS	01



Amendments

Issue No.	Date	Description
-	-	-
-	-	-

KEY

	Survey area
	Survey grid
A	GPS referencing point

OS GRID REFERENCES

A	561159.84 , 265747.56
B	561429.84 , 265747.56

Client

ARCHAEOLOGICAL SOLUTIONS

Project Title — Job No. 3205

GEOPHYSICAL SURVEY - LAND SOUTH OF BURWELL ROAD, EXNING

Subject

LOCATION OF SURVEY GRIDS AND REFERENCING

STRATASCAN™
GEOPHYSICS FOR ARCHAEOLOGY AND ENGINEERING
VINEYARD HOUSE
UPTON UPON SEVERN
WR8 0SA
T: 01684 592266
E: info@stratascan.co.uk
www.stratascan.co.uk

SUMO GROUP MEMBER

Scale 1:2000 (0m 20 40 60 80 100)

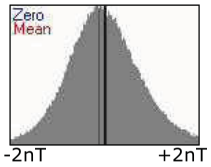
Plot	Checked by	Issue No.
A3	PPB	01
Survey date	Drawn by	Figure No.
OCT 2012	RAJS	02

Amendments

Issue No.	Date	Description
-	-	-
-	-	-

Plotting parameters

Maximum +2nT (black)
Minimum -2nT (white)



Client

ARCHAEOLOGICAL SOLUTIONS

Project Title — Job No. 3205

GEOPHYSICAL SURVEY - LAND SOUTH OF BURWELL ROAD, EXNING

Subject

PLOT OF MINIMALLY PROCESSED GRADIOMETER DATA- WEST

STRATASCAN™
GEOPHYSICS FOR ARCHAEOLOGY AND ENGINEERING
VINEYARD HOUSE
UPTON UPON SEVERN
WR8 0SA
T: 01684 592266
E: info@stratascan.co.uk
www.stratascan.co.uk

SUMO GROUP MEMBER

Scale 1:1000 — 0m 10 20 30 40 50

Plot	Checked by	Issue No.
A3	PPB	01
Survey date	Drawn by	Figure No.
OCT 2012	RAJS	03

Amendments

Issue No.	Date	Description
-	-	-
-	-	-

KEY

PROBABLE ARCHAEOLOGY

- Positive anomaly / weak positive anomaly - probable cut feature of archaeological origin
- Negative anomaly / weak negative anomaly - probable bank or earthwork of archaeological origin
- Moderate strength discrete anomaly - probable thermoremanent feature
- Widely spaced curving parallel linear anomalies - probably related to ridge-and-furrow

POSSIBLE ARCHAEOLOGY

- Positive anomaly / weak positive anomaly - possible cut feature of archaeological origin
- Negative anomaly / weak negative anomaly - possible bank or earthwork of archaeological origin
- Moderate strength discrete anomaly - possible thermoremanent feature
- Magnetic spike - probable ferrous object

OTHER ANOMALIES

- Closely spaced parallel linear anomalies - probably related to agricultural activity such as ploughing
- Linear anomaly - probably related to pipe, cable or other modern service
- Linear anomaly - possibly related to vehicle track
- Magnetic disturbance associated with nearby metal object such as service or field boundary
- Strong magnetic debris - possible disturbed or made ground
- Scattered magnetic debris
- Area of amorphous magnetic variation - probable natural (e.g. geological or pedological) origin

Client

ARCHAEOLOGICAL SOLUTIONS

Project Title — Job No. 3205

GEOPHYSICAL SURVEY - LAND SOUTH OF BURWELL ROAD, EXNING

Subject

ABSTRACTION AND INTERPRETATION OF GRADIOMETER ANOMALIES- WEST

STRATASCAN™
GEOPHYSICS FOR ARCHAEOLOGY AND ENGINEERING
VINEYARD HOUSE
UPTON UPON SEVERN
WR8 0SA
T: 01684 592266
E: info@stratascan.co.uk
www.stratascan.co.uk

SUMO GROUP MEMBER

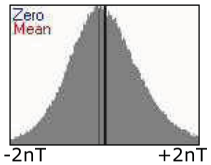
Scale	Plot	Checked by	Issue No.
1:1000 (0m 10 20 30 40 50)	A3	PPB	01
	Survey date	Drawn by	Figure No.
	OCT 2012	RAJS	04

Amendments

Issue No.	Date	Description
-	-	-
-	-	-

Plotting parameters

Maximum +2nT (black)
Minimum -2nT (white)



Client

ARCHAEOLOGICAL SOLUTIONS

Project Title — Job No. 3205

GEOPHYSICAL SURVEY - LAND SOUTH OF BURWELL ROAD, EXNING

Subject

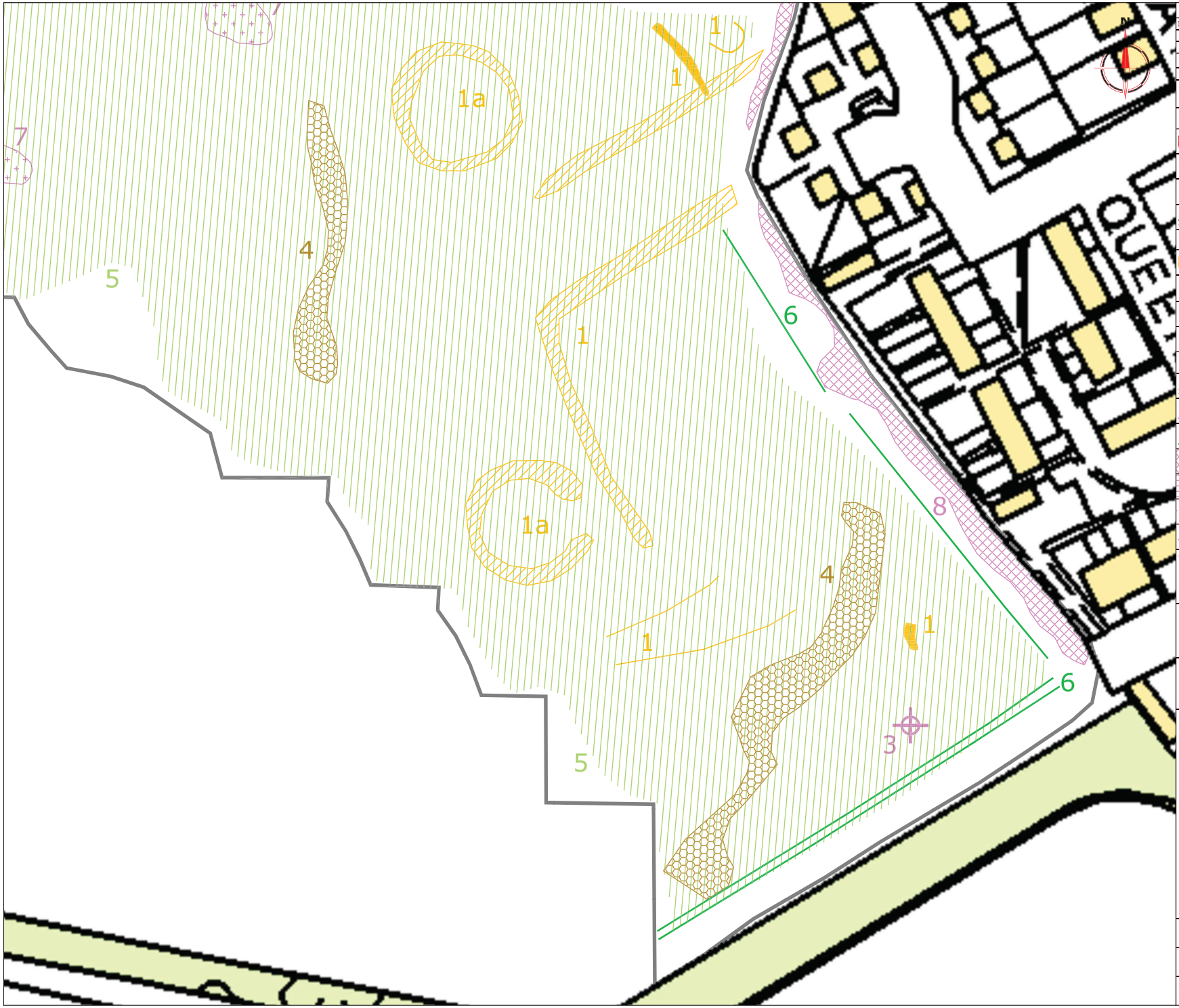
PLOT OF MINIMALLY PROCESSED GRADIOMETER DATA- EAST

STRATASCAN™
GEOPHYSICS FOR ARCHAEOLOGY AND ENGINEERING
VINEYARD HOUSE
UPTON UPON SEVERN
WR8 0SA
T: 01684 592266
E: info@stratascan.co.uk
www.stratascan.co.uk

SUMO GROUP MEMBER

Scale 1:1000 — 0m 10 20 30 40 50

Plot	Checked by	Issue No.
A3	PPB	01
Survey date	Drawn by	Figure No.
OCT 2012	RAJS	05



Amendments

Issue No.	Date	Description
-	-	-
-	-	-

KEY

PROBABLE ARCHAEOLOGY

- Positive anomaly / weak positive anomaly - probable cut feature of archaeological origin
- Negative anomaly / weak negative anomaly - probable bank or earthwork of archaeological origin
- Moderate strength discrete anomaly - probable thermoremanent feature
- Widely spaced curving parallel linear anomalies - probably related to ridge-and-furrow

POSSIBLE ARCHAEOLOGY

- Positive anomaly / weak positive anomaly - possible cut feature of archaeological origin
- Negative anomaly / weak negative anomaly - possible bank or earthwork of archaeological origin
- Moderate strength discrete anomaly - possible thermoremanent feature
- Magnetic spike - probable ferrous object

OTHER ANOMALIES

- Closely spaced parallel linear anomalies - probably related to agricultural activity such as ploughing
- Linear anomaly - probably related to pipe, cable or other modern service
- Linear anomaly - possibly related to vehicle track
- Magnetic disturbance associated with nearby metal object such as service or field boundary
- Strong magnetic debris - possible disturbed or made ground
- Scattered magnetic debris
- Area of amorphous magnetic variation - probable natural (e.g. geological or pedological) origin

Client

ARCHAEOLOGICAL SOLUTIONS

Project Title — Job No. 3205

GEOPHYSICAL SURVEY - LAND SOUTH OF BURWELL ROAD, EXNING

Subject

ABSTRACTION AND INTERPRETATION OF GRADIOMETER ANOMALIES- EAST

STRATASCAN™
GEOPHYSICS FOR ARCHAEOLOGY AND ENGINEERING
VINEYARD HOUSE
UPTON UPON SEVERN
WR8 0SA
T: 01684 592266
E: info@stratascan.co.uk
www.stratascan.co.uk

SUMO GROUP MEMBER

Scale	Plot	Checked by	Issue No.
1:1000 (0m 10 20 30 40 50)	A3	PPB	01
	Survey date	Drawn by	Figure No.
	OCT 2012	RAJS	06

Amendments

Issue No.	Date	Description
-	-	-
-	-	-

Plotting parameters

Maximum +100nT (red)
Minimum -100nT (blue)

+100nT

-100nT

Client

ARCHAEOLOGICAL SOLUTIONS

Project Title — Job No. 3205

GEOPHYSICAL SURVEY - LAND SOUTH OF BURWELL ROAD, EXNING

Subject

COLOUR PLOT OF GRADIOMETER DATA SHOWING EXTREME VALUES

STRATASCAN™
GEOPHYSICS FOR ARCHAEOLOGY AND ENGINEERING
VINEYARD HOUSE
UPTON UPON SEVERN
WR8 0SA
T: 01684 592266
E: info@stratascan.co.uk
www.stratascan.co.uk

SUMO GROUP MEMBER

Scale 1:1500

0m 10 20 30 40 50m

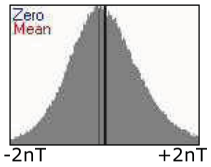
Plot	Checked by	Issue No.
A3	PPB	01
Survey date	Drawn by	Figure No.
OCT 2012	RAJS	07

Amendments

Issue No.	Date	Description
-	-	-
-	-	-

Plotting parameters

Maximum +2nT (black)
Minimum -2nT (white)



Client

ARCHAEOLOGICAL SOLUTIONS

Project Title — Job No. 3205

GEOPHYSICAL SURVEY - LAND SOUTH OF BURWELL ROAD, EXNING

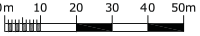
Subject

PLOT OF MINIMALLY PROCESSED GRADIOMETER DATA

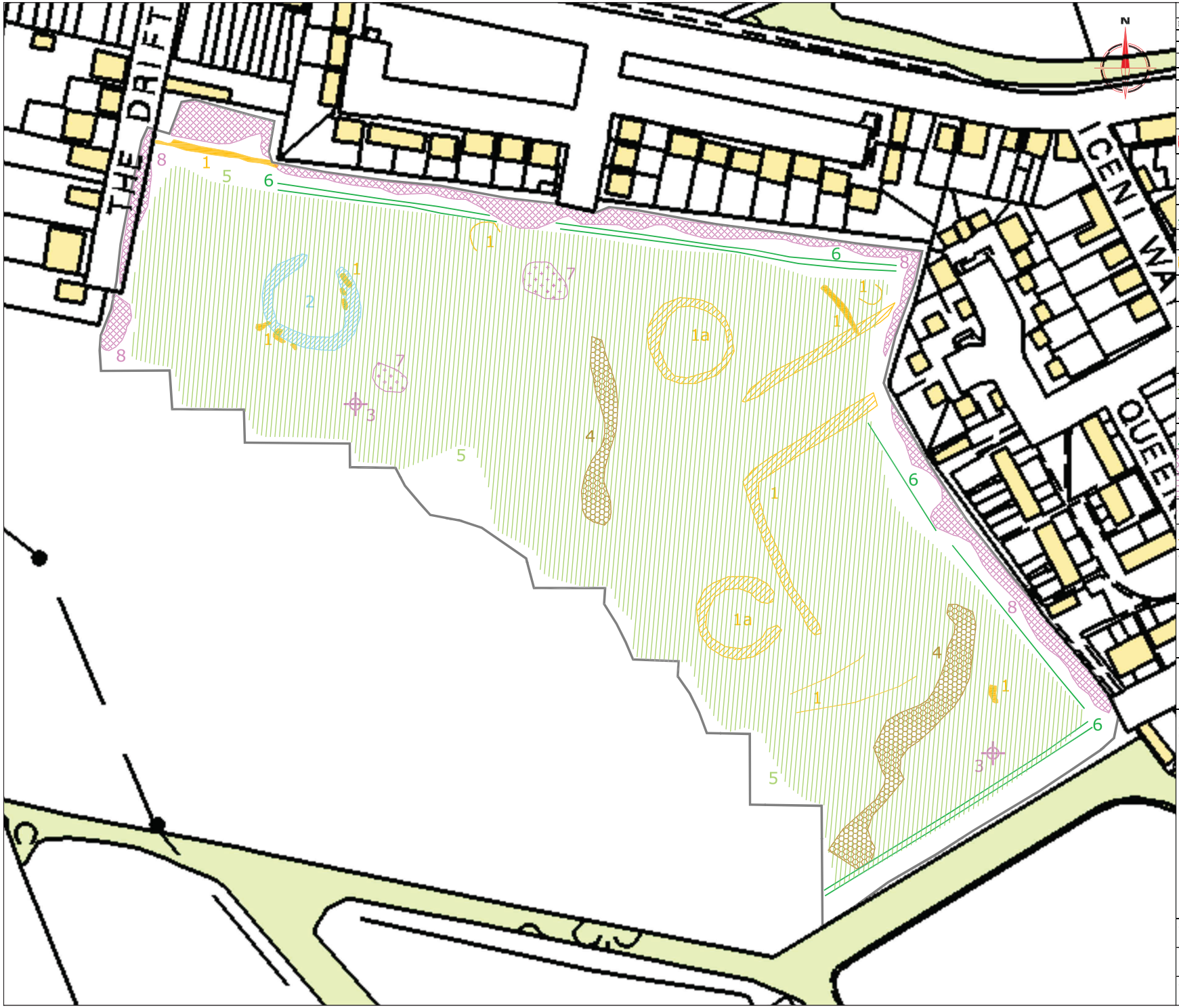
STRATASCAN™
GEOPHYSICS FOR ARCHAEOLOGY AND ENGINEERING
VINEYARD HOUSE
UPTON UPON SEVERN
WR8 0SA
T: 01684 592266
E: info@stratascan.co.uk
www.stratascan.co.uk

SUMO GROUP MEMBER

Scale 1:1500



Plot	Checked by	Issue No.
A3	PPB	01
Survey date	**Drawn by**	**Figure No.**
OCT 2012	RAJS	08



Amendments

Issue No.	Date	Description
-	-	-
-	-	-

KEY

PROBABLE ARCHAEOLOGY

- Positive anomaly / weak positive anomaly - probable cut feature of archaeological origin
- Negative anomaly / weak negative anomaly - probable bank or earthwork of archaeological origin
- Moderate strength discrete anomaly - probable thermoremanent feature
- Widely spaced curving parallel linear anomalies - probably related to ridge-and-furrow

POSSIBLE ARCHAEOLOGY

- Positive anomaly / weak positive anomaly - possible cut feature of archaeological origin
- Negative anomaly / weak negative anomaly - possible bank or earthwork of archaeological origin
- Moderate strength discrete anomaly - possible thermoremanent feature
- Magnetic spike - probable ferrous object

OTHER ANOMALIES

- Closely spaced parallel linear anomalies - probably related to agricultural activity such as ploughing
- Linear anomaly - probably related to pipe, cable or other modern service
- Linear anomaly - possibly related to vehicle track
- Magnetic disturbance associated with nearby metal object such as service or field boundary
- Strong magnetic debris - possible disturbed or made ground
- Scattered magnetic debris
- Area of amorphous magnetic variation - probable natural (e.g. geological or pedological) origin

Client

ARCHAEOLOGICAL SOLUTIONS

Project Title — Job No. 3205

GEOPHYSICAL SURVEY - LAND SOUTH OF BURWELL ROAD, EXNING

Subject

ABSTRACTION AND INTERPRETATION OF GRADIOMETER ANOMALIES

STRATASCAN™
GEOPHYSICS FOR ARCHAEOLOGY AND ENGINEERING
VINEYARD HOUSE
UPTON UPON SEVERN
WR8 0SA
T: 01684 592266
E: info@stratascan.co.uk
www.stratascan.co.uk

SUMO GROUP MEMBER

Scale		
1:1500	0m 10 20 30 40 50m	
Plot: A3	Checked by: PPB	Issue No.: 01
Survey date: OCT 2012	Drawn by: RAJS	Figure No.: 09

APPENDIX 5 OASIS DATA COLLECTION FORM

OASIS DATA COLLECTION FORM: England

Printable version

OASIS ID: archaeol7-155035

Project details

Project name	Land South of Burwell Road, Exning, Suffolk
Short description of the project	In January 2013 Archaeological Solutions Ltd (AS) carried out an archaeological evaluation at land south of Burwell Road, Exning, Suffolk (NGR TL 613 656). It was undertaken in advance of the proposed construction of a residential development and was required to support a planning application (Forest Heath District Council Planning Ref. F/2012/0552/OUT). To the south of the site a large scatter of prehistoric, Roman and medieval metalwork has been recorded, indicative of occupation (HER EXG 051). The majority of the evaluation trenches contained no archaeological features and finds, and the recorded features occurred in the north-eastern and central sectors of the site (Trenches 14, 16, 19 and 21). The majority of features contained no archaeological finds and are undated. Ditch F1009 and Gully F1015 contained a few (5 or less) sherds of 11th - 13th century pottery. The latter is abraded and may be residual, and therefore the dating of these features is not secure. Each feature also contained residual Roman pottery. The features are mostly linear (ditches and gullies). One undated pit (F1033 Tr. 16) and a possible pit (F1017 Tr. 19) were recorded. Interpretation of the features is uncertain as the majority are undated and isolated. There was a small correlation of the archaeological features with the geophysical survey data. Electromagnetic anomalies were attributed to archaeological features only in Trench 21 and possibly also in Trench 14.
Project dates	Start: 01-01-2013 End: 31-01-2013
Previous/future work	No / Not known
Any associated project reference codes	P5037 - Contracting Unit No.
Any associated project reference codes	EXG 101 - Sitecode
Type of project	Field evaluation
Site status	None
Current Land use	Other 15 - Other
Monument type	NONE None
Significant Finds	SHERDS Roman
Significant Finds	SHERDS Medieval
Methods & techniques	"Sample Trenches","Targeted Trenches"
Development type	Rural residential

Prompt	Planning condition
Position in the planning process	Pre-application

Project location

Country	England
Site location	SUFFOLK FOREST HEATH EXNING Land South of Burwell Road, Exning, Suffolk
Study area	6.05 Hectares
Site coordinates	TL 613 656 52 0 52 15 51 N 000 21 50 E Point
Height OD / Depth	Min: 20.00m Max: 20.00m

Project creators

Name of Organisation	Archaeological Solutions Ltd
Project brief originator	Suffolk County Council Archaeological Service Conservation Team
Project design originator	Jon Murray
Project director/manager	Jon Murray
Project supervisor	Mariusz Gorniak
Name of sponsor/funding body	Exning Homes Ltd

Project archives

Physical Archive Exists?	No
Digital Archive recipient	Suffolk County Archaeological Store
Digital Contents	"Survey"
Digital Media available	"Images raster / digital photography","Survey","Text"
Paper Archive recipient	Suffolk County Archaeological Store
Paper Contents	"Survey"
Paper Media available	"Photograph","Plan","Report","Survey "

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Land South of Burwell Road, Exning, Suffolk
Author(s)/Editor(s)	Gorniak, M
Other bibliographic details	Archaeological Solutions Report No. 4236

Date	2013
Issuer or publisher	Archaeological Solutions Ltd
Place of issue or publication	Bury St Edmunds

Entered by	Sarah Powell (info@ascontracts.co.uk)
Entered on	16 July 2013

OASIS:

Please e-mail English Heritage for OASIS help and advice

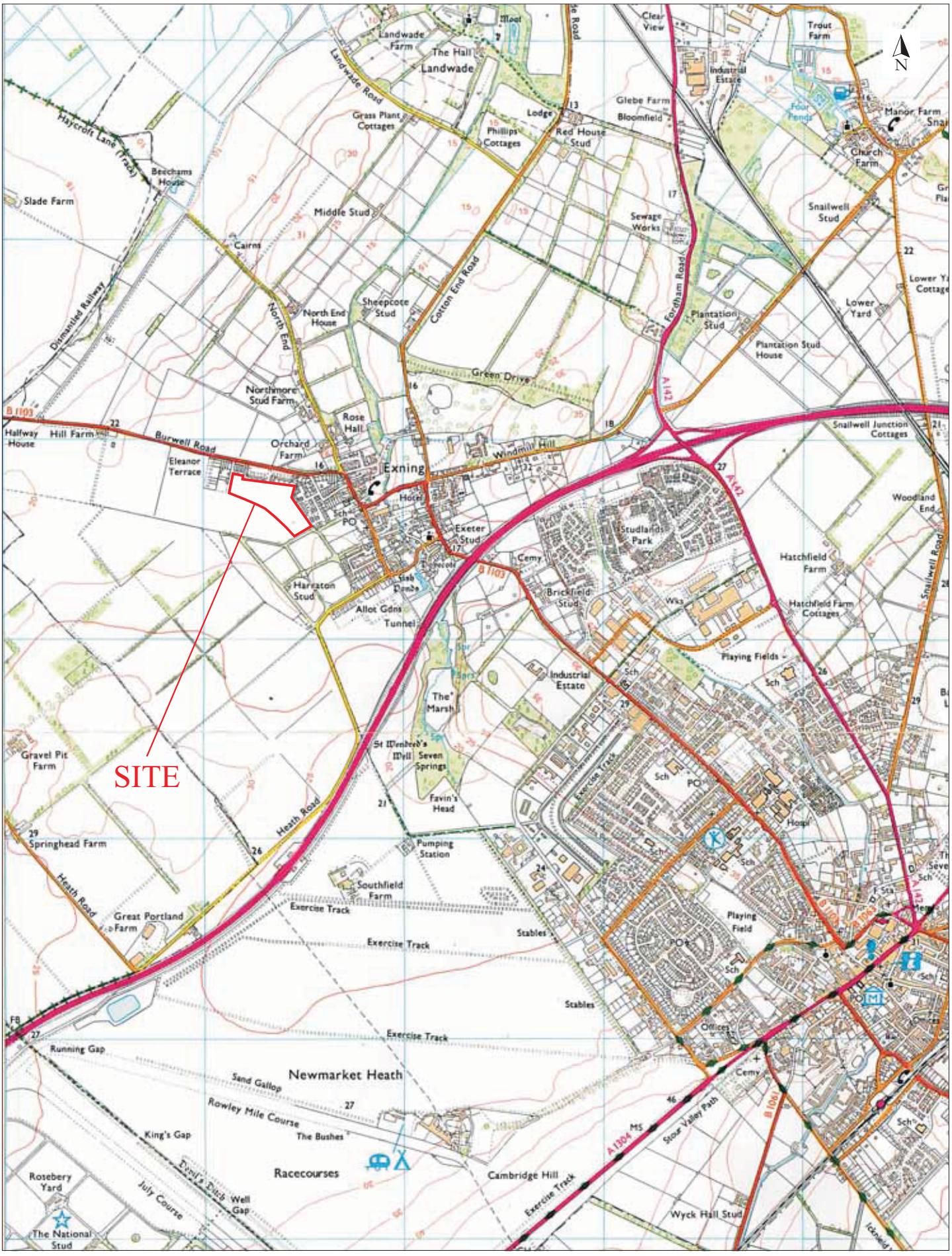
PHOTOGRAPHIC INDEX

1
Excavated features in Trench 21

2
Excavated features in Trench 16

3
F1017 in Trench 19

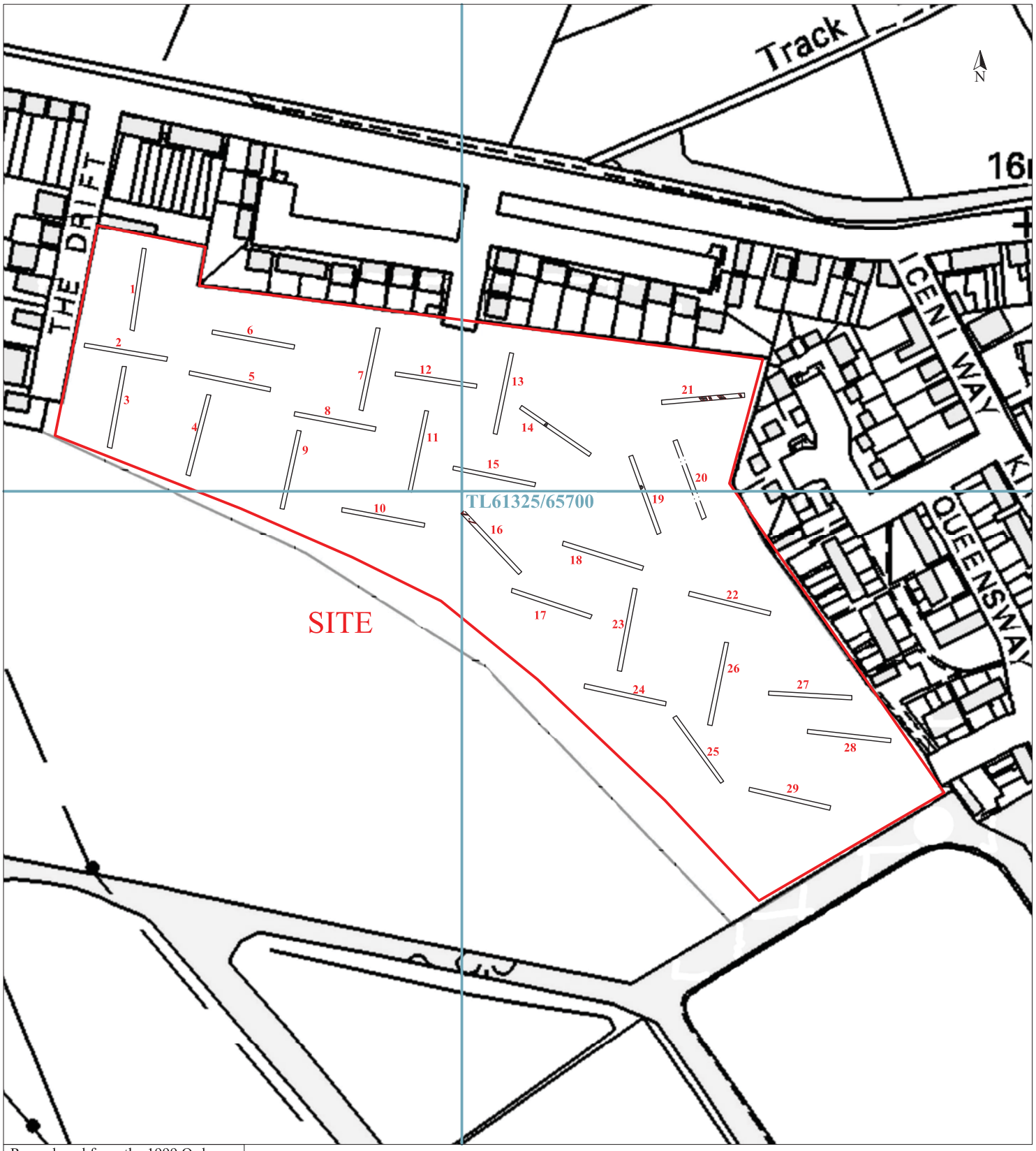
4
F1033 & F1035 in Trench 16



Archaeological Solutions Ltd

Fig. 1 Site location plan

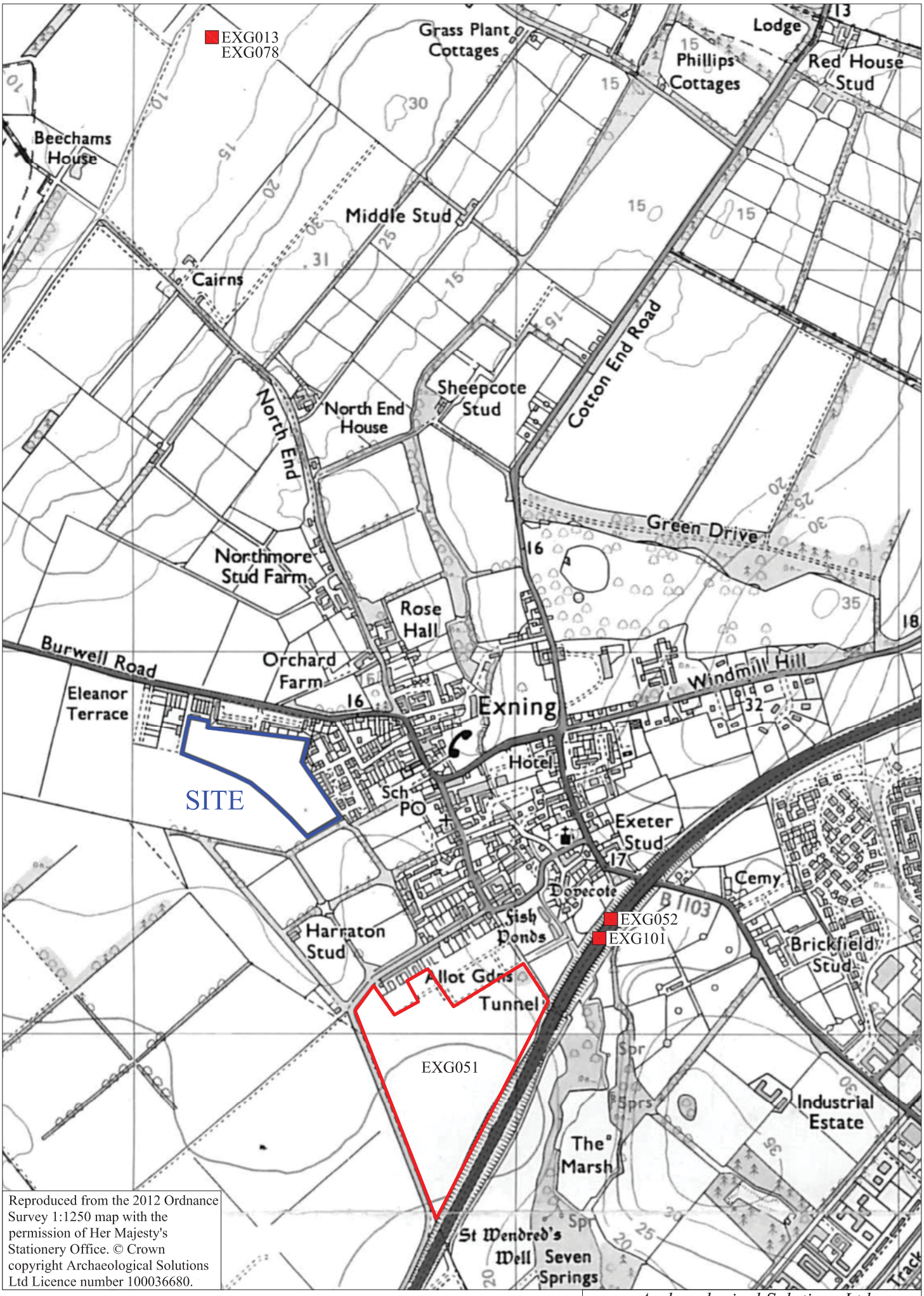
Scale 1:25,000 at A4



Archaeological Solutions Ltd

Fig. 2 Detailed site location plan

Scale 1:2500 at A4



Reproduced from the 2012 Ordnance Survey 1:1250 map with the permission of Her Majesty's Stationery Office. © Crown copyright Archaeological Solutions Ltd Licence number 100036680.

Archaeological Solutions Ltd

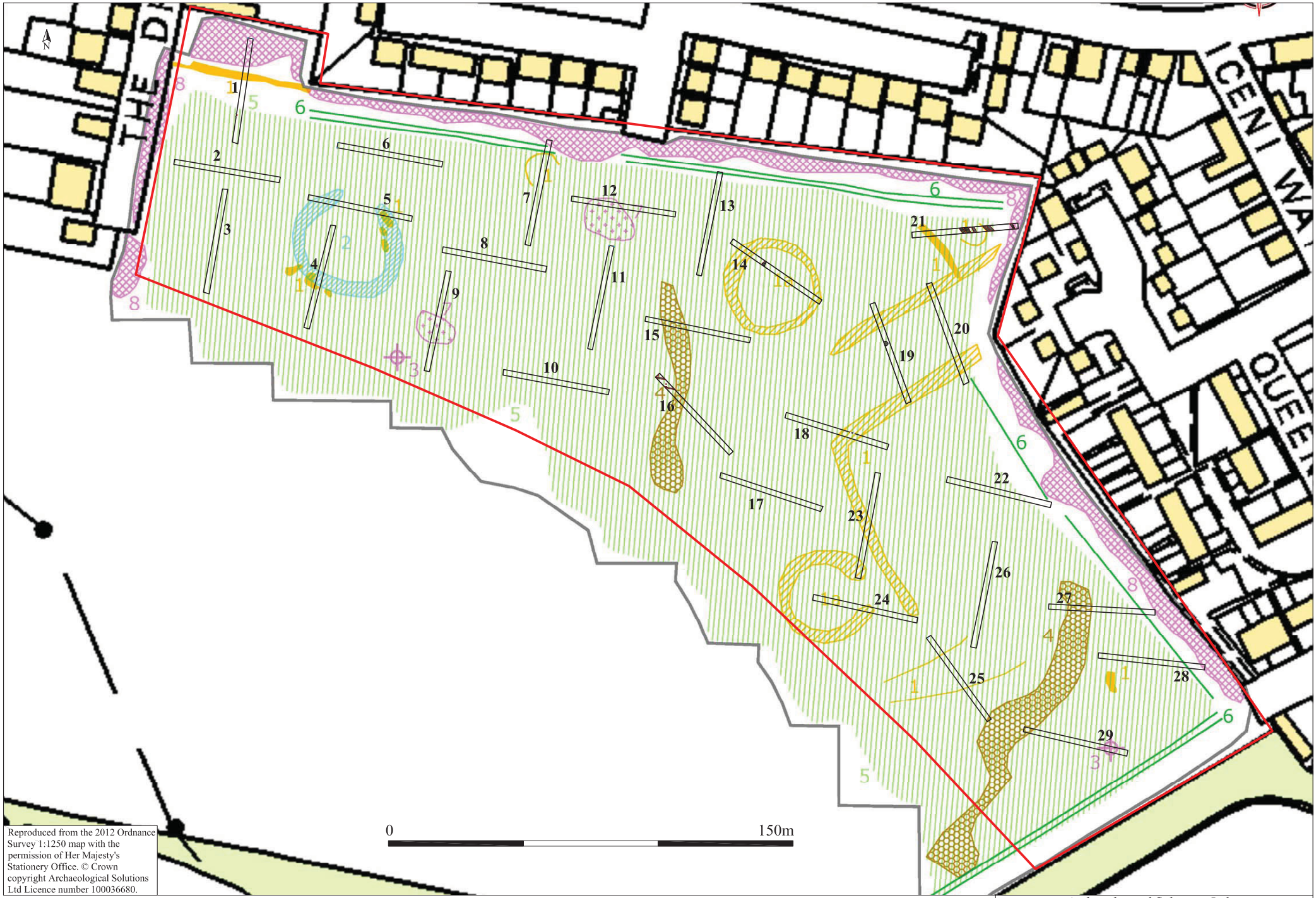
Fig. 3 HER Data

Scale 1:12,500 at A4

Archaeological Solutions Ltd

Fig. 4 Gradiometer survey results

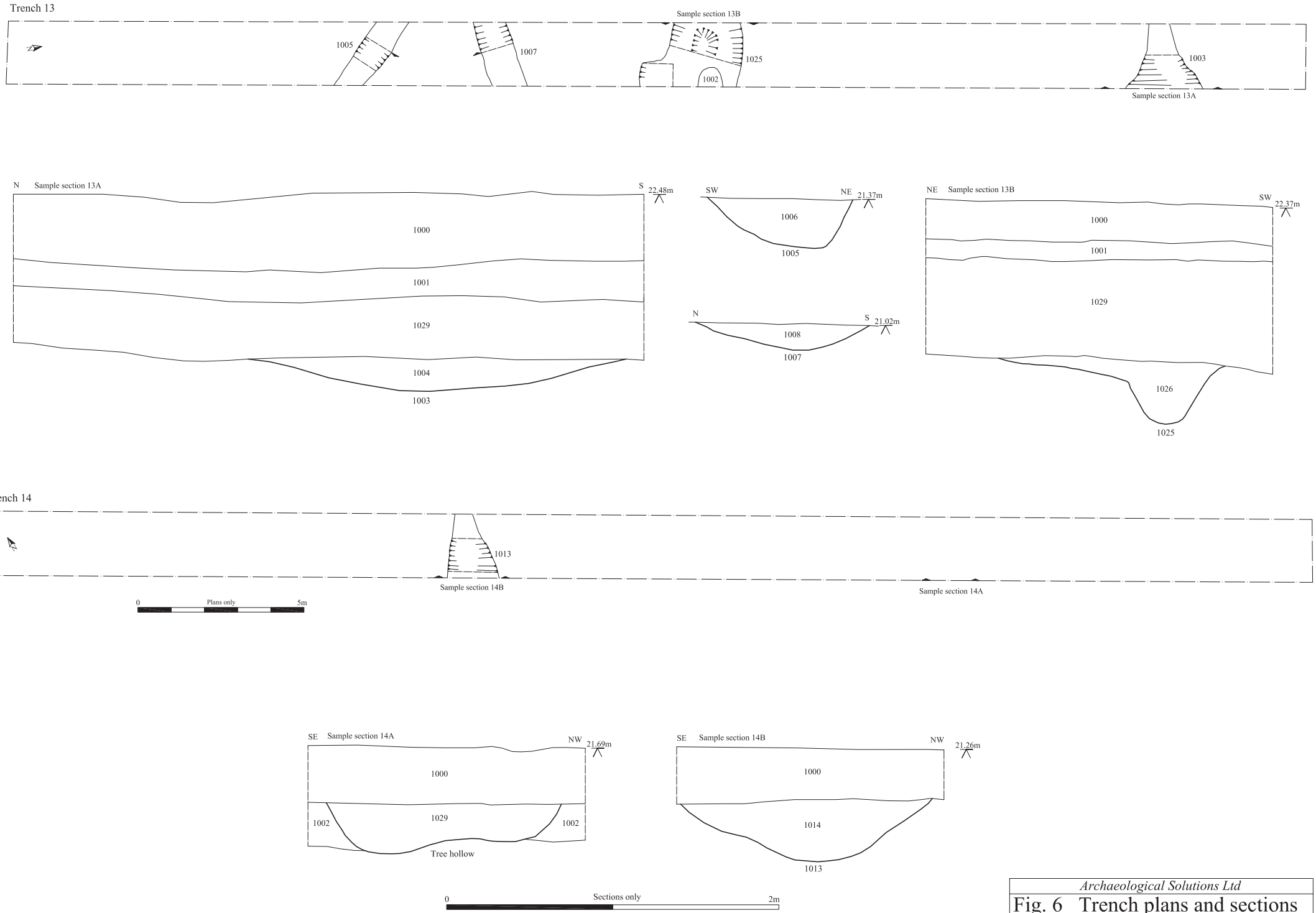
Scale 1:1250 at A3



Archaeological Solutions Ltd

Fig. 5 Interpretative survey results

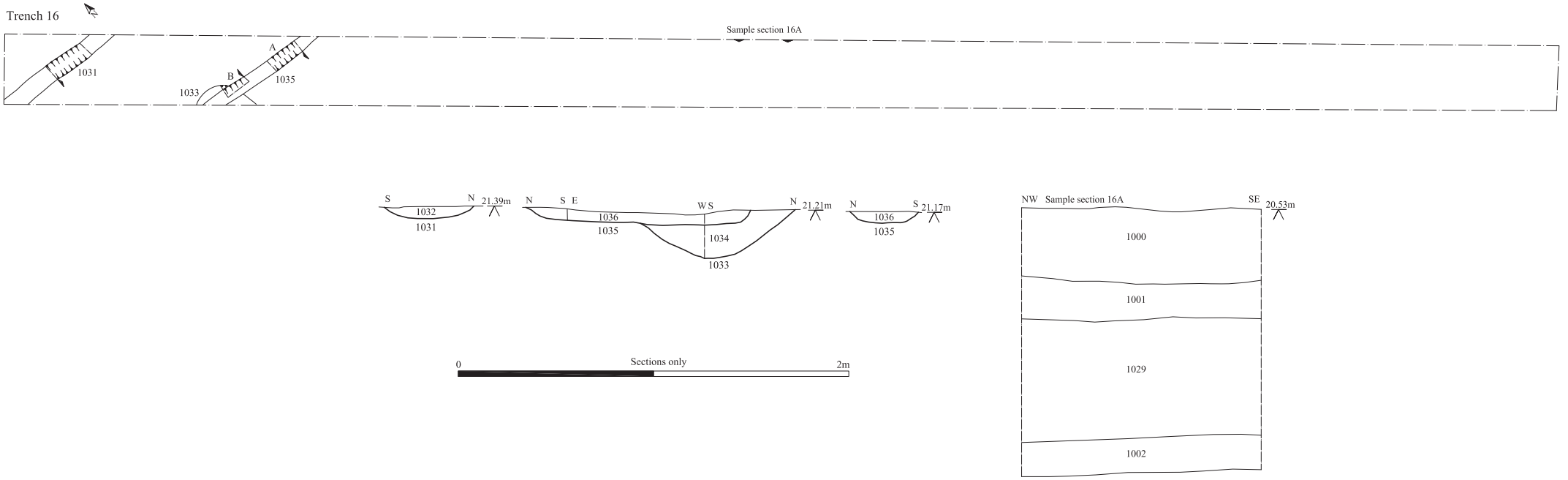
Scale 1:1250 at A3



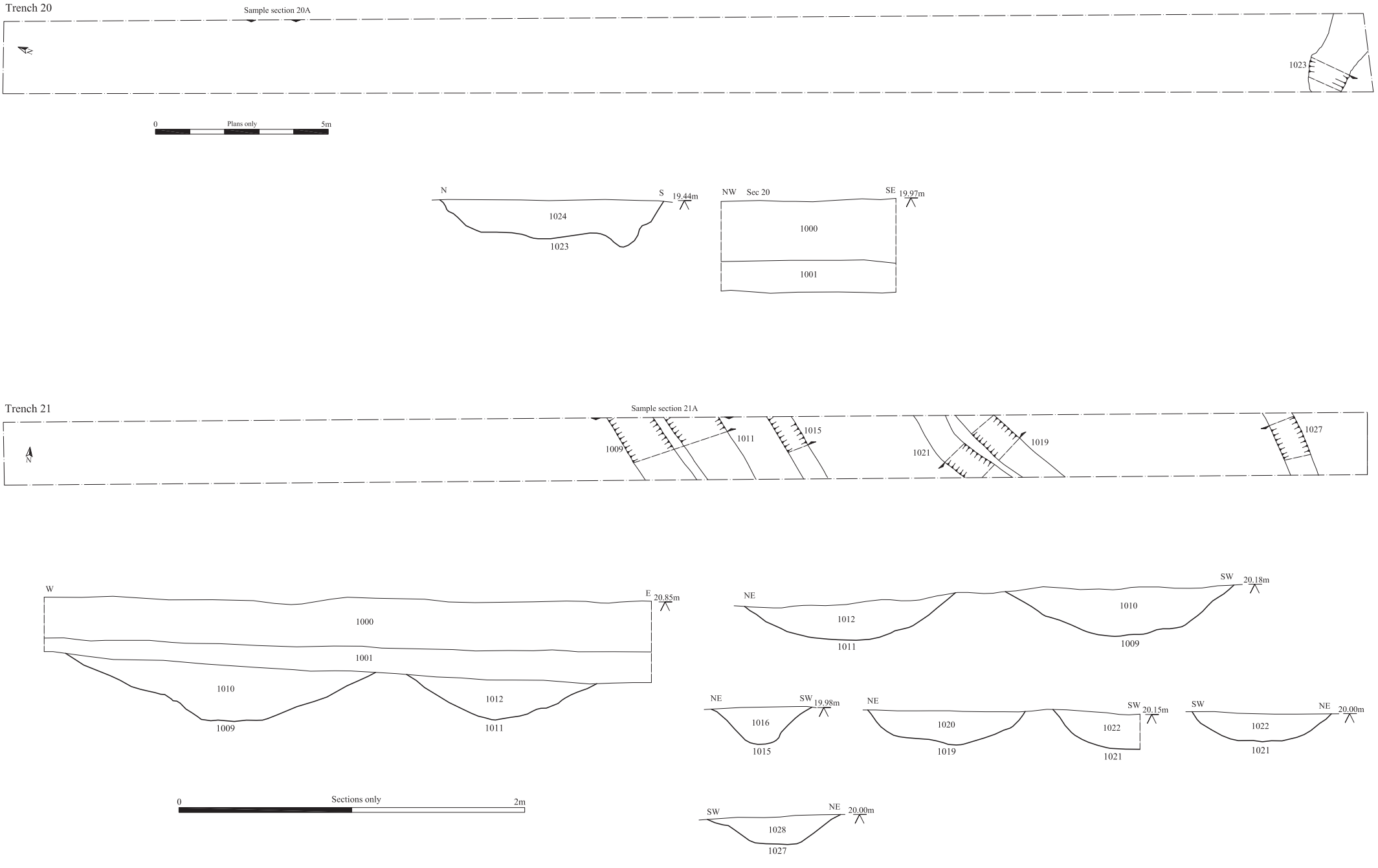
Archaeological Solutions Ltd

Fig. 6 Trench plans and sections

Scale 1:100 and 1:20 at A3



Archaeological Solutions Ltd
Fig. 7 Trench plans and sections
Scale 1:100 and 1:20 at A3



Archaeological Solutions Ltd

Fig. 8 Trench plans and sections

Scale 1:100 and 1:20 at A3