

**EASTON VILLAGE GROWTH LOCATION
EASTON, NORFOLK**

Report on Archaeological Geophysical Survey 2014

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Surveyed by:

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for:

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on behalf of:

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EASTON VILLAGE GROWTH LOCATION EASTON, NORFOLK

Report on Archaeological Geophysical Survey 2014

Summary

This report describes a geophysical survey undertaken as part of an archaeological field evaluation of a proposed development site at Easton near Norwich. The site was surveyed in full with the exception of a few localised obstructions.

Ground conditions at the site appear to be favourable for the detection of archaeological features by means of a magnetometer survey, but no clearly defined or unambiguous archaeological findings were observed. Various previously identified archaeological sites and features are present in the vicinity of, but not necessarily within, the proposed development area, and the survey findings are consistent with these limited expectations.

The survey has detected a number of recent or non-archaeological ground disturbances, but the only findings of potential archaeological relevance are weak and isolated magnetic anomalies which could perhaps indicate eroded traces of ditches or enclosures at two locations. Alternatively these disturbances could be minor cultivation effects.

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Report on Archaeological Geophysical Survey 2014

Introduction

The purpose of this geophysical survey was to test for evidence of archaeological sites or remains at a site which has been proposed for housing development.

The survey was commissioned from Bartlett Clark Consultancy (BCC), Specialists in Archaeogeophysics of Oxford, by the Cambridge Archaeological Unit (CAU), on behalf of the Easton Landowners Consortium and Boyer Planning. Fieldwork for the survey was done between 16-25 April 2014. Plots of the survey data and comments on the findings have previously been submitted to Boyer Planning, and are now included in this report.

The Site

Background information on site conditions and the archaeological potential of the site and its surroundings is included in a Desk Based Assessment (DBA), which was provided to us by Cambridge Archaeological Unit [1]. Comments based on this information were included in the Method Statement prepared in advance of the survey by BCC [2]. The following notes are reproduced in part from these documents.

Location and topography

The proposed development area (PDA) is located about 9.5km west of Norwich to the south of the A47 and existing housing at Easton. It is centred approximately at NGR TG 135106. The PDA amounts in total to c. 52.6ha, of which the area proposed for geophysical investigation (excluding woodland and other obstructions) was about 44.6 ha, as indicated by red cross hatching on figure 1. Various overgrown areas could not be surveyed, and the final coverage (blue outline in figure 1) therefore amounts to 42.4ha.

The site is currently farmland in mixed use as arable and pasture. There is a small area of allotments in the NW corner of the PDA, where the ground was too obstructed to permit geophysical coverage.

It is mentioned in the DBA that the site is on a chalk bedrock overlain by Devensian Glacial Fluvial Deposits (sand, gravel, clay and silt). Conditions at the site should be reasonably favourable for the magnetic detection of archaeological features, given that previous surveys on gravel soils in the vicinity of Norwich have produced positive

archaeological findings.

Magnetic susceptibility measurements were made on soil samples collected during the survey to test the potential responsiveness of the site to magnetic investigation. These gave readings between 20-28 ($\times 10^{-8}$ SI/kg), which lie well within a range which should permit effective magnetometer surveying.

Archaeological background

The DBA includes a full listing of known archaeological sites within 0.5km of the PDA, and a summary of others within a 4km radius. Sites recorded in the County HER are indicated on the plan (reproduced from DBA figure 1) inset in figure 3 of the present report.

Previously recorded archaeological findings from within the PDA itself are limited to coin and flint findspots, and possible former field boundaries. They include a medieval coin (31) found towards the NW of the site in fieldwalking in 1981, and probably post-medieval boundary earthworks (35b). These are located in woodland (Four Acre Plantation) which could not be surveyed. Prehistoric flint flakes were found to the NE of the site (28 on plan) during fieldwalking in advance of the construction of the Norwich southern bypass. The survey results show that this field has since been heavily disturbed, and so no further archaeological evidence can be recovered. A watching brief on the line of the bypass itself recovered evidence of prehistoric pits filled with burnt material.

A tithe map of 1813 (reproduced from DBA figure 5) is shown inset in figure 2. This indicates various former field boundaries, as well as buildings at Upper Farm which were still extant in 1946.

Other nearby findings as noted in the DBA include a complex system of cropmarks representing enclosures and fields probably of mainly Roman date. These were identified immediately to the west of the site (centred at TG 124106) in 2010. These findings could represent domestic and agricultural enclosures of more than one phase. It is possible that features associated with this activity could extend further to the east into the PDA, although the mapped extent of the complex lies outside the PDA to the west. (The survey has not in fact produced any evidence that features associated with these cropmarks extend to within the PDA.)

Findings elsewhere within the 4km radius study area examined in the DBA include barrows and a henge monument. The surrounding landscape includes other prehistoric and Romano-British activity, with sites identified from aerial photographs and fieldwork.

Survey Procedure

The site was investigated by means of a recorded magnetometer survey. Readings were collected along transects 1m apart using Bartington 1m fluxgate gradiometers, and are plotted at 25cm intervals along each transect. The results of the survey are presented at

1:2000 scale as a grey scale plot (figures 4-6), and as graphical (x-y trace) plots at 1:1500 (figures 7-11). Comparison of these alternative presentations allows the detected magnetic anomalies to be examined in plan and profile respectively. An interpretation of the findings is shown superimposed on figures 7-11 (which permits the interpreted outlines to be compared with the underlying data), and is reproduced separately to provide a summary of the findings (figures 2-3).

The graphical plots in figures 7-11 show the magnetometer readings after minimal pre-processing [of the kind permitted by English Heritage (2008) *Geophysical Survey in Archaeological Field Evaluation* Section 4.8, p10]. This includes adjustment for irregularities in line spacing caused by variations in the instrument zero setting, and truncation of extreme values. Additional weak 2D low pass filtering has been applied to the grey scale plot to adjust background noise levels.

The magnetometer responds to cut features such as ditches and pits when they are silted with topsoil, which usually has a higher magnetic susceptibility than the underlying natural subsoil. It also detects the thermoremanent magnetism of fired materials, notably baked clay structures such as kilns or hearths, and so responds preferentially to the presence of ancient settlement or industrial remains. It is also strongly affected by ferrous and other debris of recent origin.

Colour coding has been used in the interpretation to distinguish different effects. A few magnetic anomalies which may show characteristics to be expected from features of potential archaeological interest are outlined in red. Background magnetic anomalies which may be of natural or non-archaeological origin are lightly outlined in brown, but with bold outlines for some stronger or more distinct examples. Magnetic disturbances at the site of Upper Farm are shown in a darker brown, and clearly recent disturbances in grey. Possible cultivation effects are in green, and some of the more conspicuous ferrous objects (identifiable as narrow spikes in the graphical plots) are marked in light blue.

Figures 12-14 are included in the report to meet additional specific requirements stated in the generic brief for magnetometer surveys, as issued by Norfolk Historic Environment Service [3]. These figures show the magnetometer data without the conventional correction to the zero level in each transect, which is the usual initial step in data processing. The brief requires these plots to be supplied in addition to the minimally processed graphical data reproduced in figures 7-11. The brief also requires a data block to be re-surveyed at the end of each day of fieldwork. The re-surveyed sample blocks are shown alongside the main survey in figures 12-14.

Survey location

The survey grid was set out and tied to the OS grid using a Trimble ProXRT GPS system (with VRS correction to give accuracy of c. 0.1m). The plans are therefore geo-referenced, and OS co-ordinates of map locations can be read from the AutoCAD version of the plans, which can be supplied with this report.

Results

Fields within the survey area have been numbered (1-11 in an approximately east –west sequence) for reference in this report. The following comments refer to the fields in this order. The survey has detected various subsurface features and disturbances, but they appear to be mainly of natural or non-archaeological origin, and only a few show any of the characteristics to be expected from archaeological findings.

Fields 1-2

Finds in both fields include parallel north-south linear markings which are visible in the grey scale plot (in the direction as indicated by green lines in the interpretation), and which may be slightly more distinct here than in the remainder of the survey. These probably relate to current or recent cultivation. (Field 1 was under a growing pea crop at the time of the survey.) The linear markings in field 1 align with a field boundary shown on the 1813 map (inset in figure 2), but it is unclear whether that has been detected.

Other findings include strong disturbances (outlined in grey) which are visible near the field boundaries here, and elsewhere in the survey. These are likely to be of recent origin (and to represent such disturbances as scatters or spreads of rubble or hardcore near field entrances).

A few individual features are labelled on figure 2. These include broad weak magnetic anomalies (A, D), and examples of smaller and more distinct features (outlined in red) at B and C. Magnetic anomalies such as A and D could indicate silted pits or hollows, and are shown with a stronger outline than (smaller and mainly natural) background magnetic anomalies, which are outlined in light brown. Features such as A are however broad and irregular in plan, and do not appear to form groups or clusters as might be expected at an archaeological site. It is probable therefore that they represent shallow naturally silted hollows, or variations in topsoil depth.

The magnetic anomalies outlined in red (as at B, C) are smaller and more distinct, and so could represent pits or disturbances of a size which might be found at an ancient settlement site. They are represented by rounded profiles in the graphical plots (figures 7-11), as is characteristic of pit-like features. Such features are, however, very sparsely scattered across the survey, and there are again no groups or concentrations as might be expected at a former settlement site, or similar focus of archaeological activity.

Fields 3-4

The findings again include magnetic anomalies representing broad and probably natural silted pits or hollows, the strongest of which is labelled E in field 3.

Field 4 is intersected by an east-west band of small distinct magnetic anomalies (indicated by bold outlines at F). Variations in background activity of this kind are often seen at sites with gravel soils, and probably represent a natural near-surface outcrop of gravel (which commonly includes naturally magnetic stones).

Field 5

Disturbances within this small playing field appear to be of recent origin. (Red outlines in figure 2 are items of play equipment marked on the background mapping.)

Field 6

This is one of the more productive fields of the survey. Strong magnetic disturbances (around G) must represent a spread of rubble and debris at the site of Upper Farm (as indicated on the 1813 and later maps). A nearby group of disturbances (at H) corresponds clearly to a pond shown on the 1813 map.

Various linear features or former boundaries have been detected. A linear disturbance (J) to the west of the farm is represented by a sequence of strong magnetic anomalies (as seen in the graphical plot: figure 8). This could indicate a drain or pipe within a former ditch. It aligns (but does not quite coincide) with an 1813 boundary. A linear disturbance at K clearly corresponds to an 1813 boundary, but another at N does not. The feature at N continues the line of an extant boundary to the south, and so could be a field boundary of some other date. A cluster of small magnetic anomalies at M is less concentrated than the main rubble scatter around G. It could indicate traces of an insubstantial structure associated with the farm, or could perhaps be natural (as at F).

The remaining finding in field 6 is a group of weak linear markings (visible in the grey scale plot) which appears to form a rectilinear pattern around L. These features are insubstantial and difficult to interpret, and could relate to cultivation effects or drains. They could alternatively represent eroded traces of an ancient ditched enclosure, but the survey does not offer any supporting evidence for this interpretation, given the lack of any clear indication of silted pits as might be associated with an ancient settlement site.

Fields 7-9

Findings in field 7 include a pipe (blue), and a group of disturbances at O. These could perhaps indicate an infilled pit or quarry, although they are less concentrated than at the former pond (H) in field 6. Various other disturbances in fields 7-8 appear to be recent.

Findings in field 9 include possible north-south cultivation markings (green), as in fields 1-2, and a further stronger but short ditch-like linear feature (shown in red) at P. This is slightly more distinct than the possible ditch-like features noted at L in field 6, but remains fragmentary and isolated. There is again an absence of any associated or related features to support the possibility that this could represent part of an ancient enclosure.

The magnetic anomalies at Q are close to a boundary (not shown on map). They could perhaps represent disturbances around an entrance, or an infilled pit (as at H or O). The linear disturbance at R corresponds to a boundary shown on the 1813 and later maps.

Fields 10-11

Strong disturbances at S in field 10 correspond to an area of hard standing visible in aerial photographs. Possible cultivation effects (green) do not align with the present field boundaries, but are weak and inconclusive.

There are no clearly defined magnetic anomalies in field 10 which could be interpreted as pits of the kind seen nearby on the line of the A47 (although small isolated pits, unless they are associated with enclosures or other more extended features, might be difficult to identify in a survey).

Strong, and presumably recent, magnetic disturbances extend across the whole of field 11. Disturbances of this kind could indicate a site which has been excavated and infilled, or which is covered by a grassed-over hardcore surface.

Conclusions

It is always more difficult to impose a conclusive interpretation on an apparently unproductive survey than on one which provides clear evidence of archaeological findings, but the survey results in this case appear to be consistent with the limited archaeological potential of the site, as indicated by the relative absence of HER records within the PDA.

Conditions at the site appear to be suitable for the detection of any reasonably substantial archaeological features which might be present (such as cropmark enclosures as were recorded to the west), but there is no unambiguous evidence for the presence of such findings within the survey area.

Small or isolated prehistoric pits as recorded on the line of the A47 would perhaps be difficult to distinguish from the natural background magnetic activity, but any concentrations or clusters of such features should usually be detectable, and none are clearly identifiable in the survey. The various pit-like features identified in the survey are isolated and dispersed, and do not suggest the presence of any concentrations of archaeological findings.

The survey has responded strongly to debris and disturbances at the site of Upper Farm, and has detected a number of former field boundaries. The only findings which cannot be categorised under these headings are possible ditch-like features at L and P in fields 6 and 9. These could perhaps represent fragmentary traces of former enclosures, or could be of non-archaeological origin. There are no associated or supporting findings to suggest the presence at these locations of substantial or significant archaeological sites.

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8 July 2014

The fieldwork for this project was done by N. Paveley, P. Heykoop, and R. Organ. Much of the data processing was done by C. Oatley.

References

- [1] *Easton Village Growth Location, Easton, Norfolk. Archaeological Desk Based Assessment.* Report No. 1202 by Cambridge Archaeological Unit, University of Cambridge. May 2009 (revised January 2014).
- [2] *Easton Village Growth Location, Easton, Norfolk. Method statement for archaeological geophysical survey .* Document submitted to CAU by Bartlett Clark Consultancy: 15 April 2014.
- [3] *Generic Brief for Archaeological Evaluation by Magnetometer Survey.* Document issued by Norfolk County Council Historic Environment Service, 7/12/2012.

Easton Village Growth Location: Geophysical Survey
Appendix : Inventory of Selected Findings

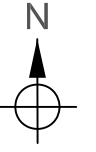
This list notes the more significant findings from the magnetometer survey of this site. The grading (1-4) given alongside each entry refers in part to the reliability of the geophysical evidence, but the potential archaeological relevance of detected features is also taken into account. Magnetic disturbances which may be mentioned in the text or indicated on plans are not necessarily included if they appear to be of clearly natural or non-archaeological origin. Survey findings which clearly relate to historic structures or boundaries are also listed as non-archaeological.

- Grade 1: Distinct magnetic anomalies of probable archaeological origin.
- Grade 2: Weaker or more isolated magnetic anomalies which could in part be archaeologically significant.
- Grade 3: Distinct magnetic anomalies, but probably recent or natural, or of other non-archaeological origin.
- Grade 4: Weaker or more isolated magnetic anomalies of probably non-archaeological origin.

Field	Feature		Grade
1, 2, 3	A, D, E	Irregular weak pit-like features (probably natural).	4
1, 2	B, C	More distinct but isolated pit-like features.	2-3
4	F	Broad strip of increased background magnetic activity: possible gravel outcrop.	3
6	G	Strong magnetic disturbances at site of Upper Farm.	3
6	H	Infilled former pond.	3
6	J	Possible drain, or magnetic debris in fill of former ditch.	3
6	K, N	Probable former field boundaries.	3
6	L	Group of weak linear magnetic anomalies: former ditches or enclosure (or perhaps cultivation effects or drains ?)	2
6	M	Scatter of small magnetic anomalies: possible structural debris (or natural as at F ?)	3
7	O	Possible infilled pit.	3

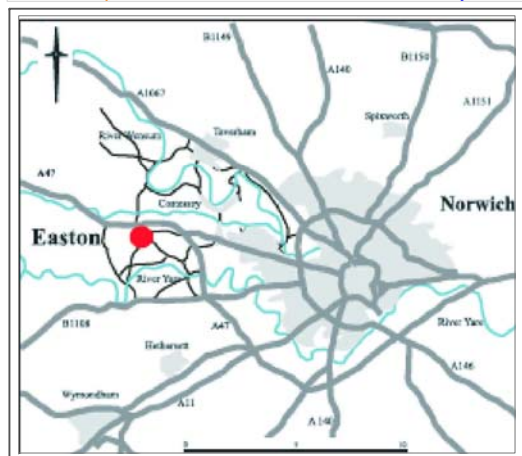
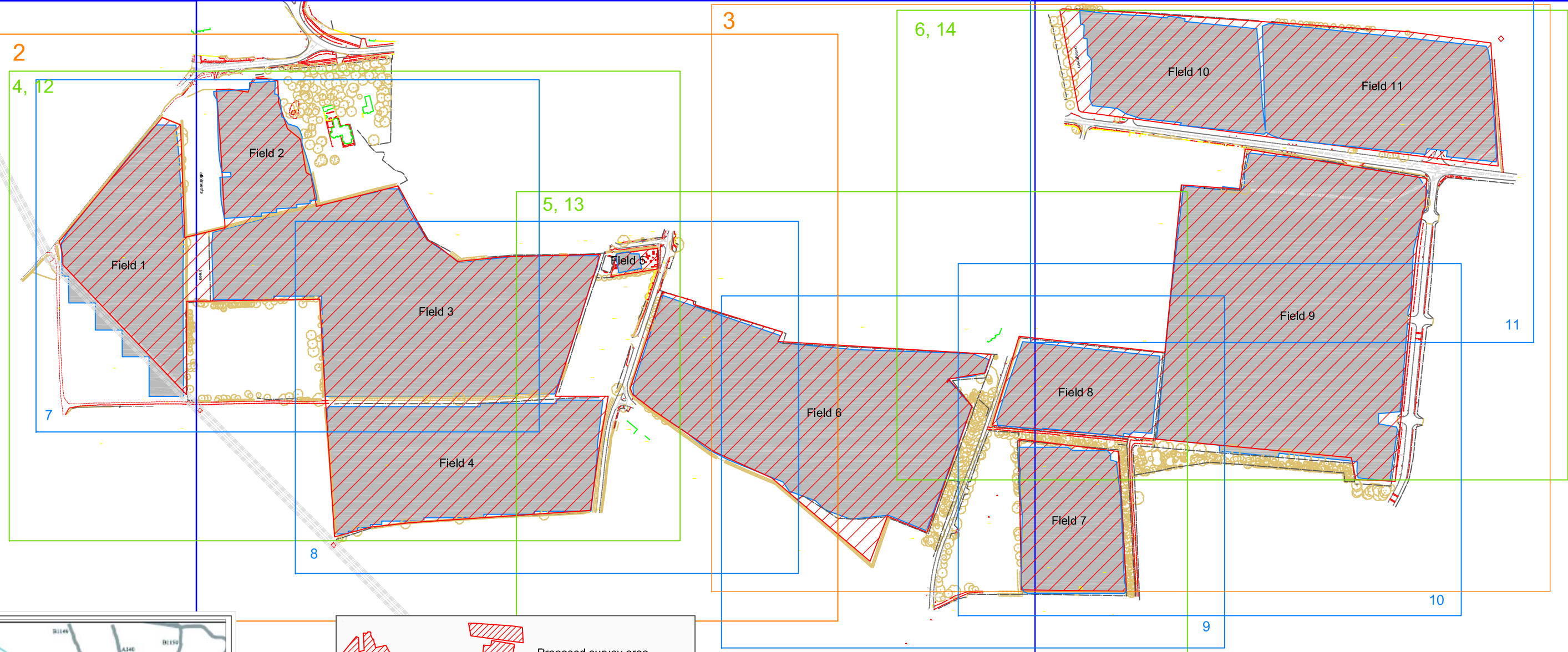
9	P	Ditch-like feature perhaps similar to L.	2
9	Q	Infilled pit (or spread of debris around field entrance ?)	3
9	R	Former field boundary	3
10	S	Paving or hard standing.	3

Background mapping reproduced from site plan by Land Survey Solutions Ltd (Drawing No. 13382ea-01).

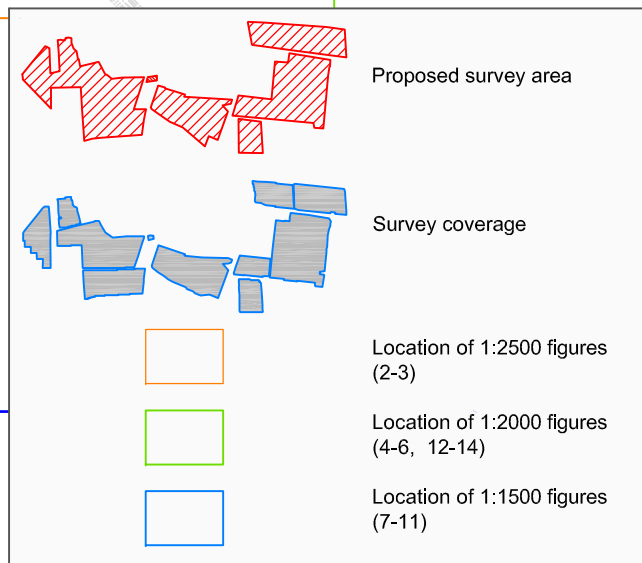


311000N

614000E











Site location (from DBA figure 1)

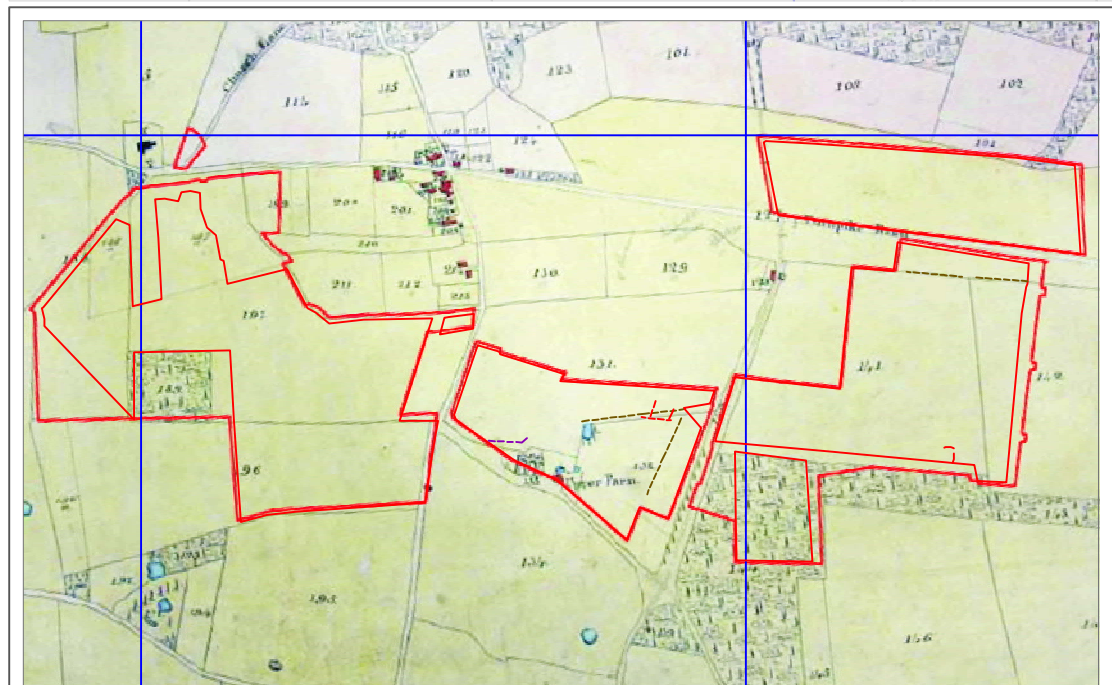
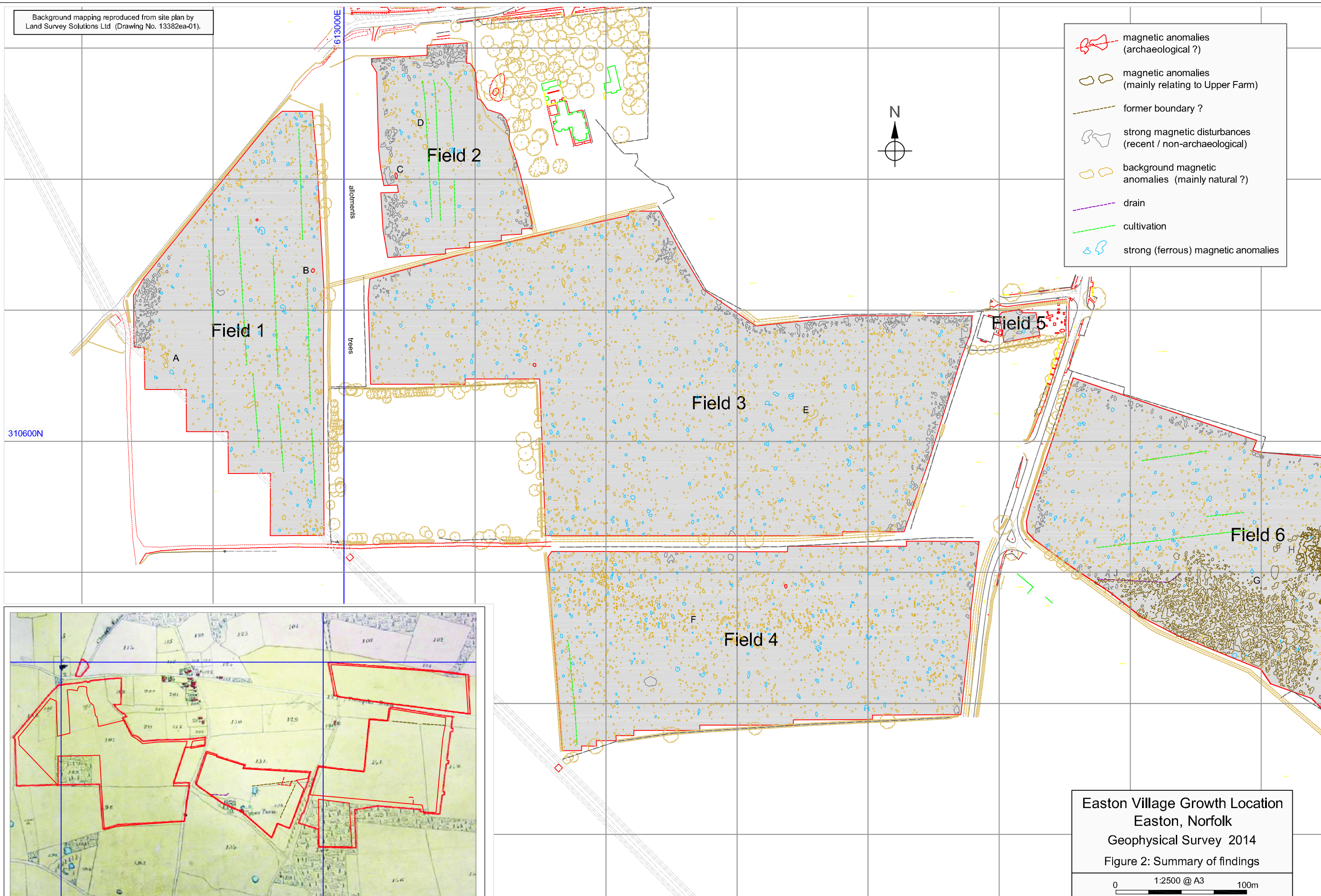


Easton Village Growth Location
 Easton, Norfolk
 Geophysical Survey 2014
 Figure 1: Location of survey



Background mapping reproduced from site plan by Land Survey Solutions Ltd (Drawing No. 13382ea-01).

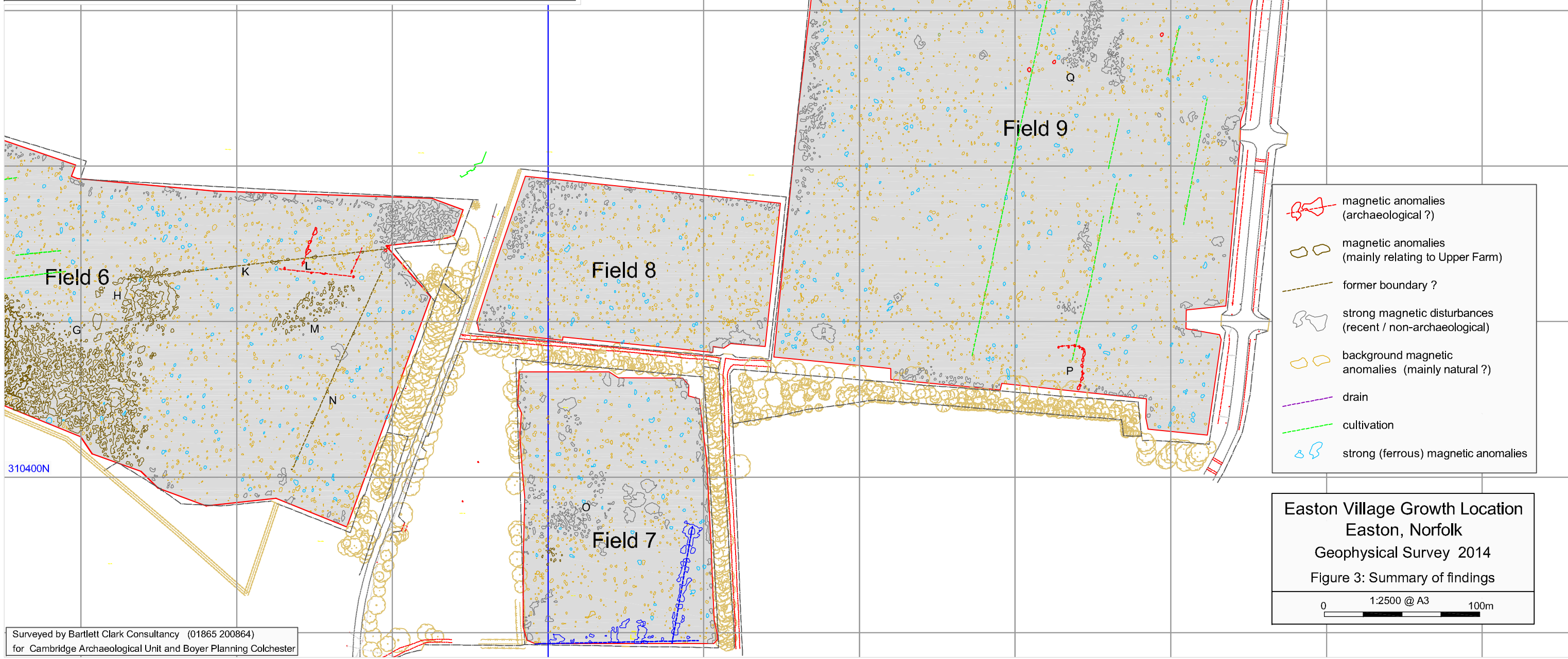
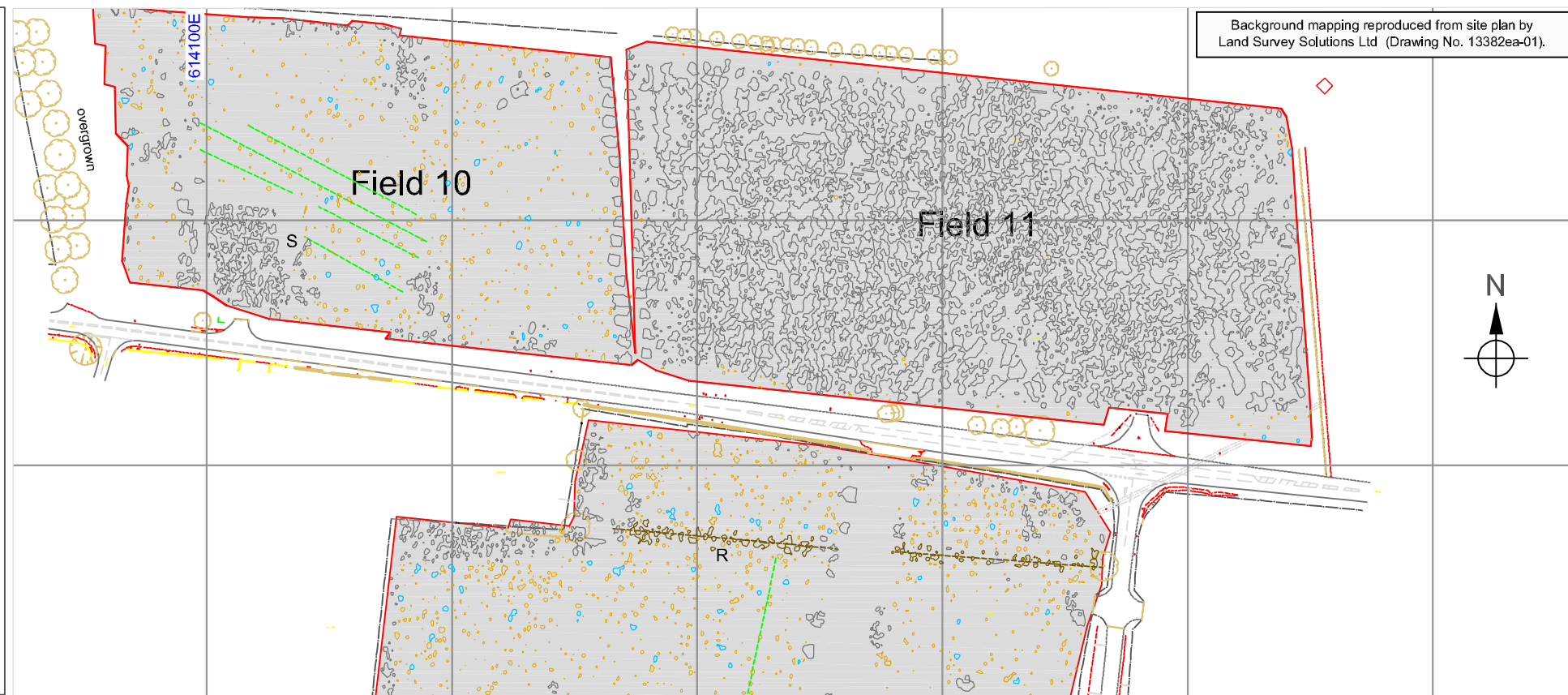
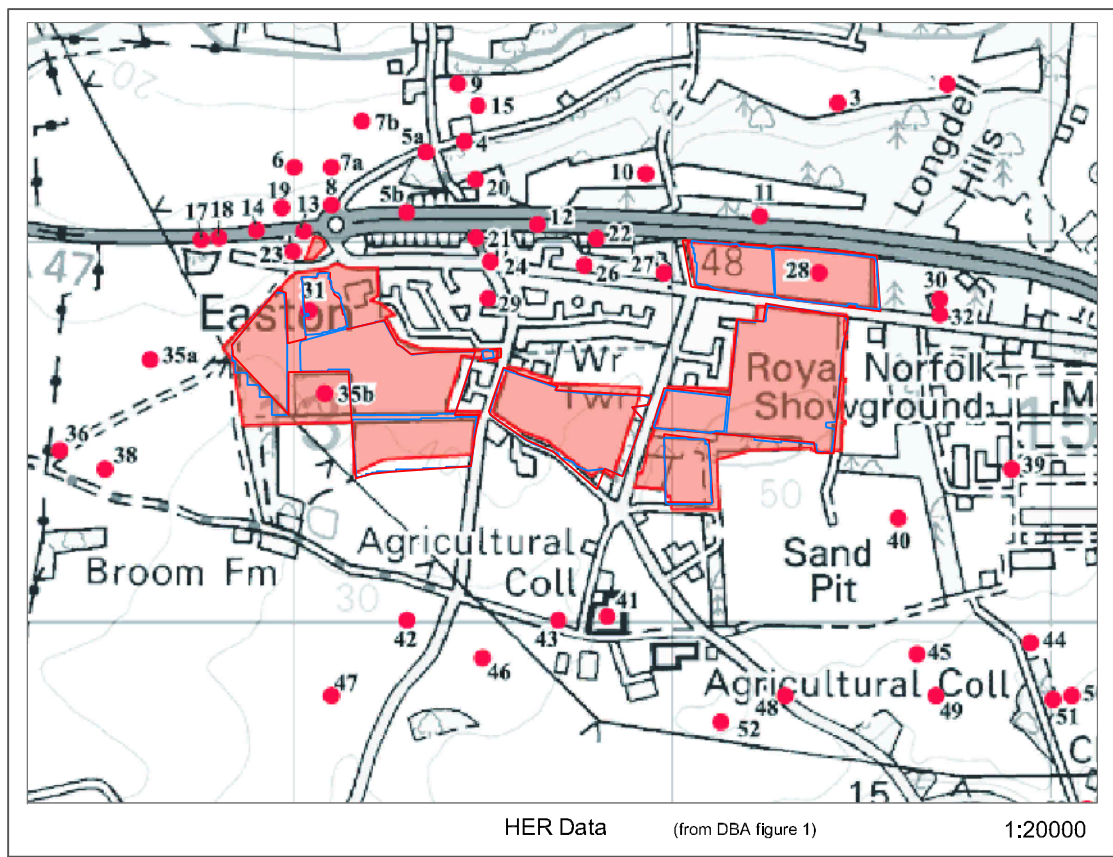
-  magnetic anomalies (archaeological ?)
-  magnetic anomalies (mainly relating to Upper Farm)
-  former boundary ?
-  strong magnetic disturbances (recent / non-archaeological)
-  background magnetic anomalies (mainly natural ?)
-  drain
-  cultivation
-  strong (ferrous) magnetic anomalies



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Easton Village Growth Location
 Easton, Norfolk
 Geophysical Survey 2014
 Figure 2: Summary of findings

0 1:2500 @ A3 100m

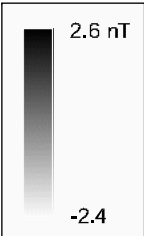
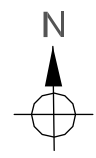


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- cultivation
- strong (ferrous) magnetic anomalies

Easton Village Growth Location
 Easton, Norfolk
 Geophysical Survey 2014
 Figure 3: Summary of findings

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Land Survey Solutions Ltd (Drawing No. 13382ea-01).

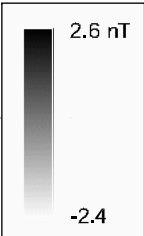
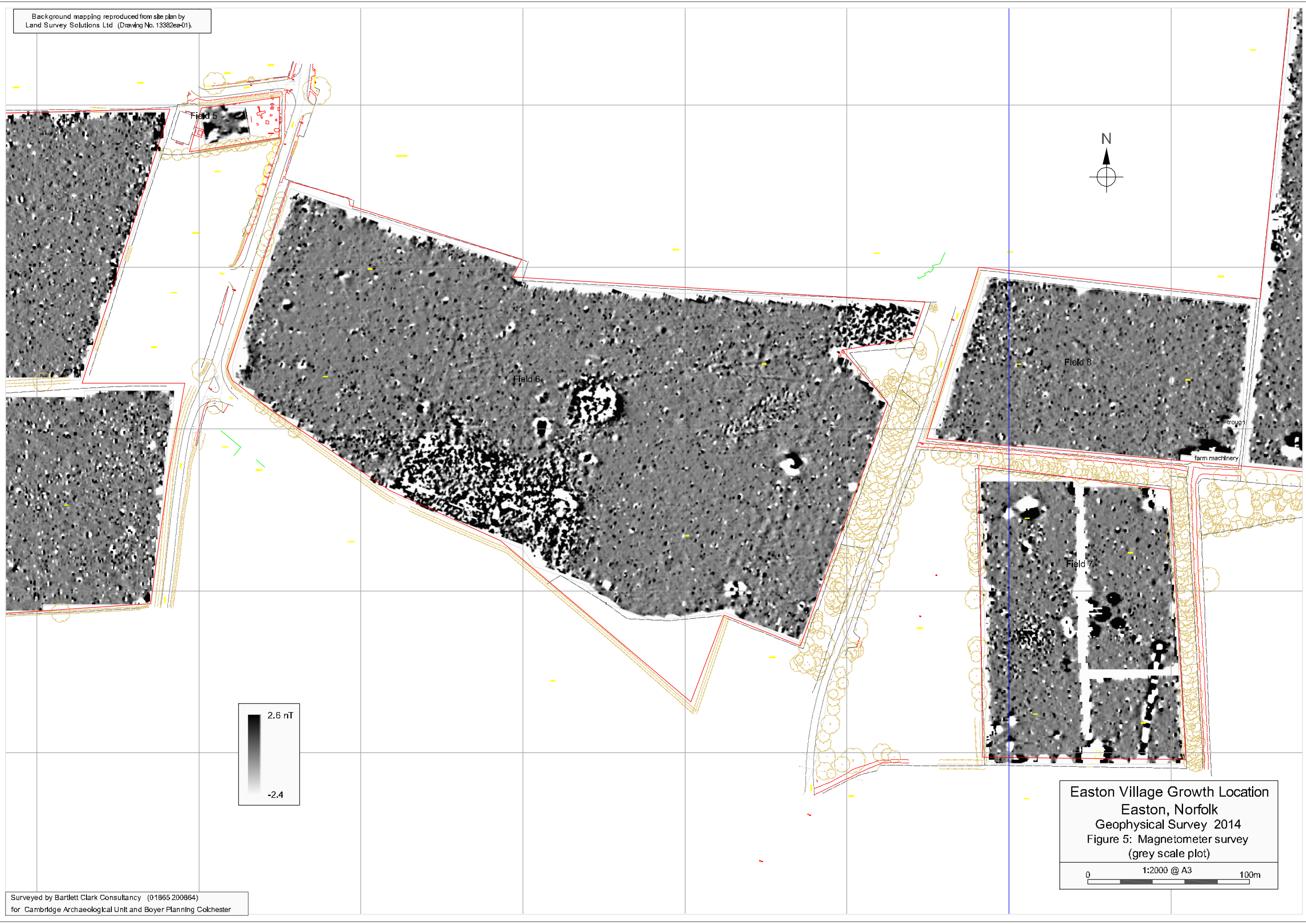


Easton Village Growth Location
Easton, Norfolk
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Figure 4: Magnetometer survey
(grey scale plot)



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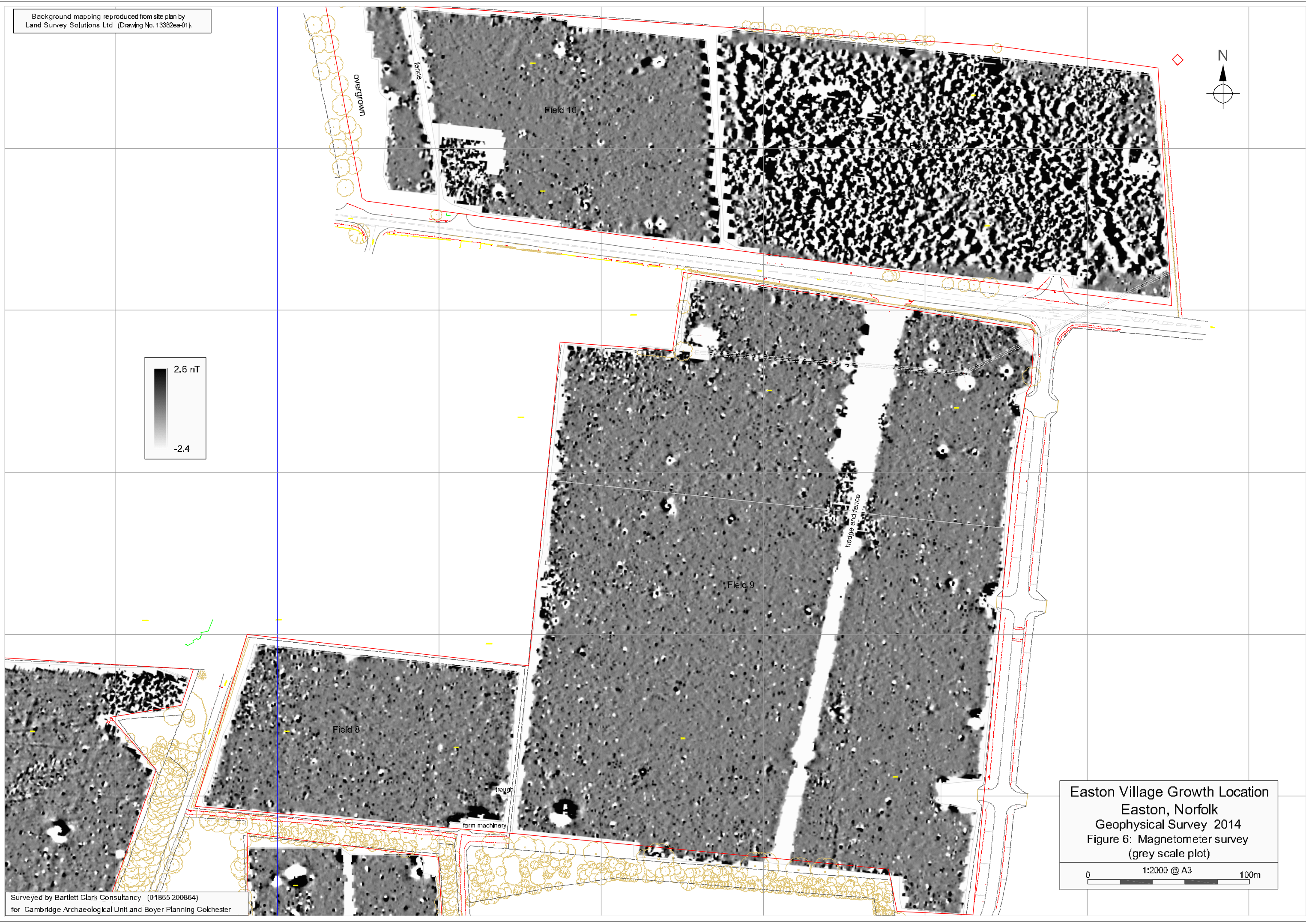
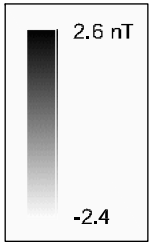


Easton Village Growth Location
Easton, Norfolk
Geophysical Survey 2014
Figure 5: Magnetometer survey
(grey scale plot)

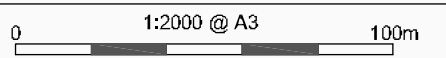
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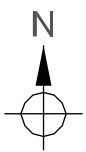
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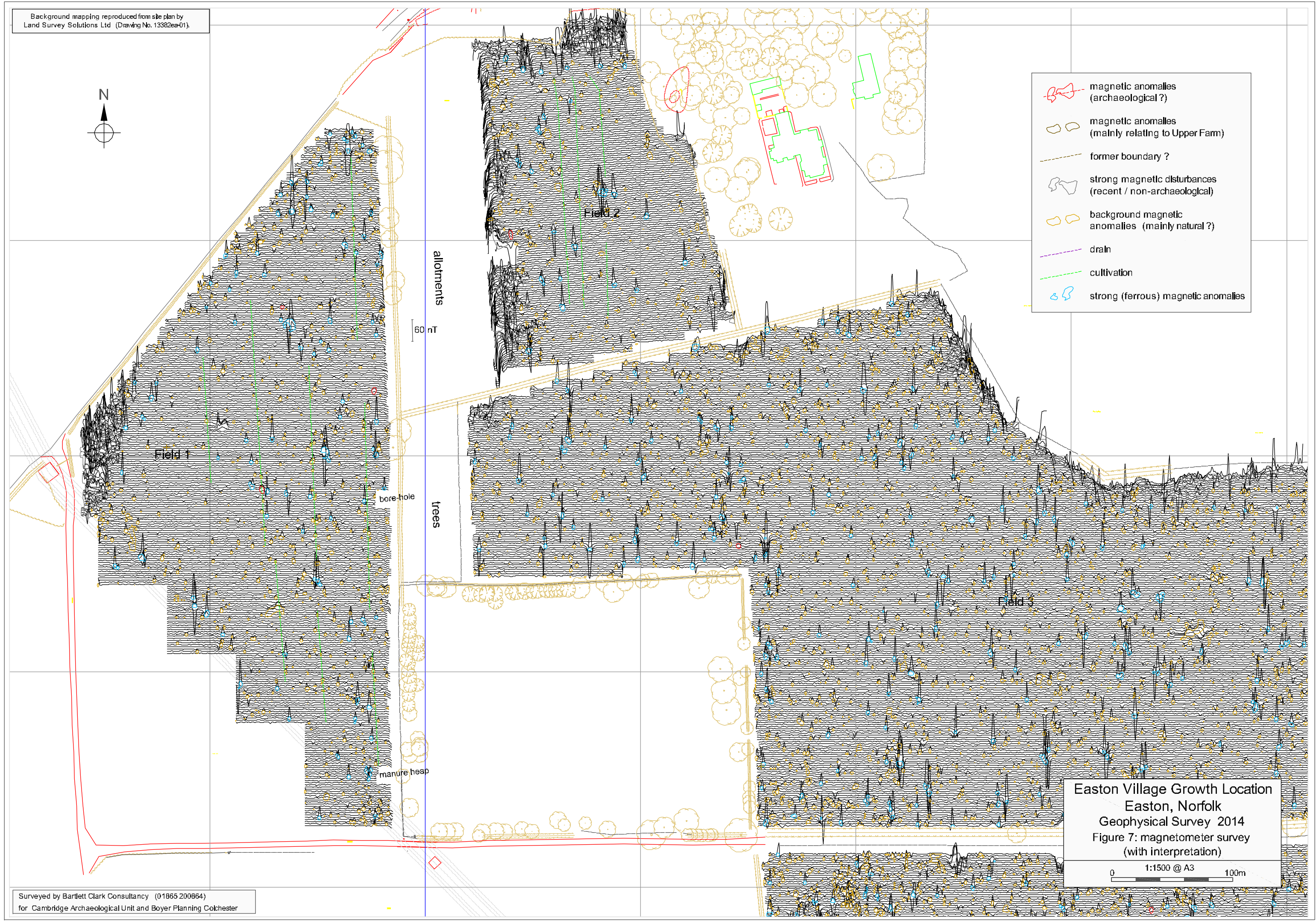


Easton Village Growth Location
Easton, Norfolk
Geophysical Survey 2014
Figure 6: Magnetometer survey
(grey scale plot)





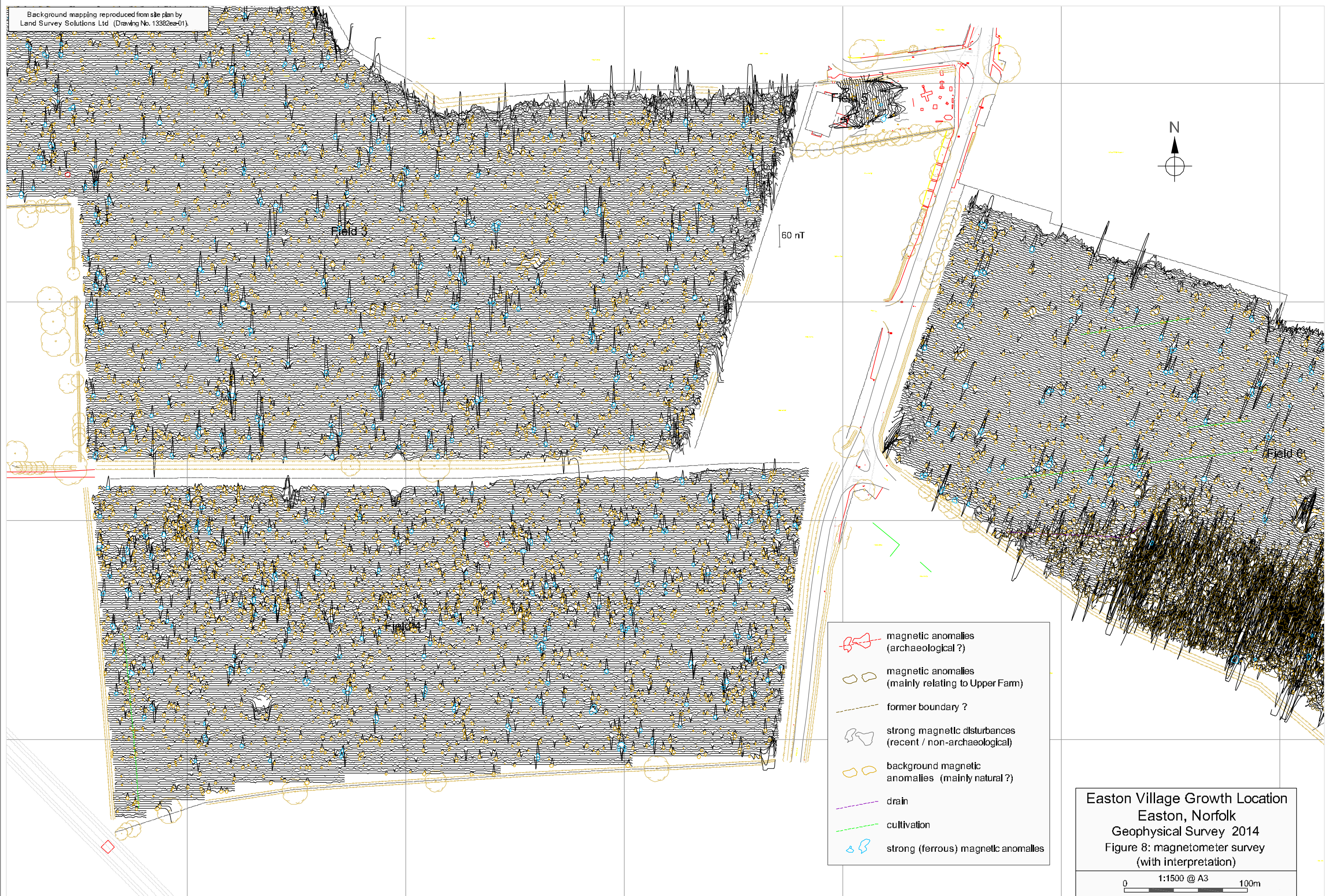
-  magnetic anomalies (archaeological ?)
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-  background magnetic anomalies (mainly natural ?)
-  drain
-  cultivation
-  strong (ferrous) magnetic anomalies



Easton Village Growth Location
Easton, Norfolk
Geophysical Survey 2014
Figure 7: magnetometer survey
(with interpretation)

0 1:1500 @ A3 100m

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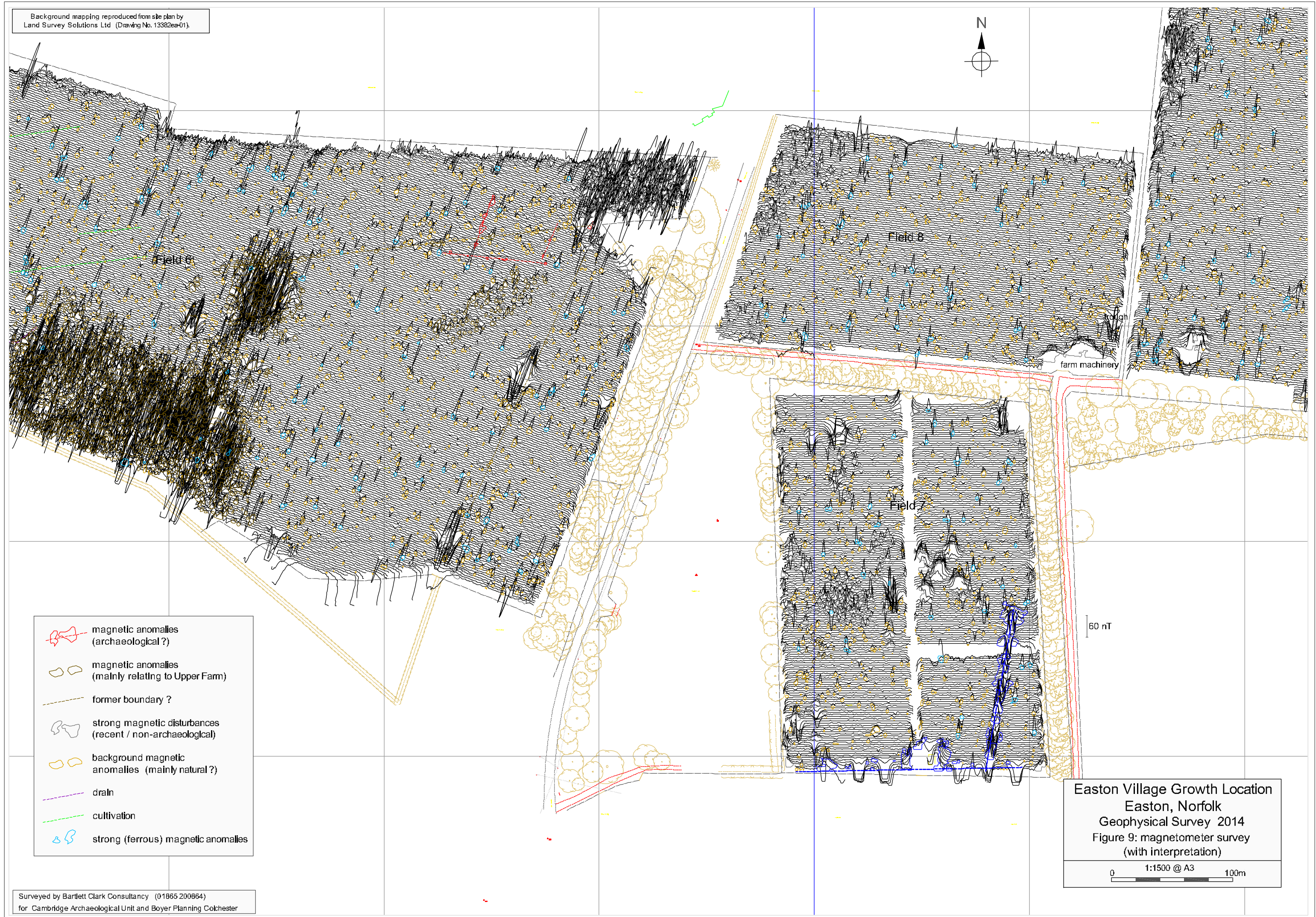










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Easton Village Growth Location
Easton, Norfolk
Geophysical Survey 2014
Figure 8: magnetometer survey
(with interpretation)

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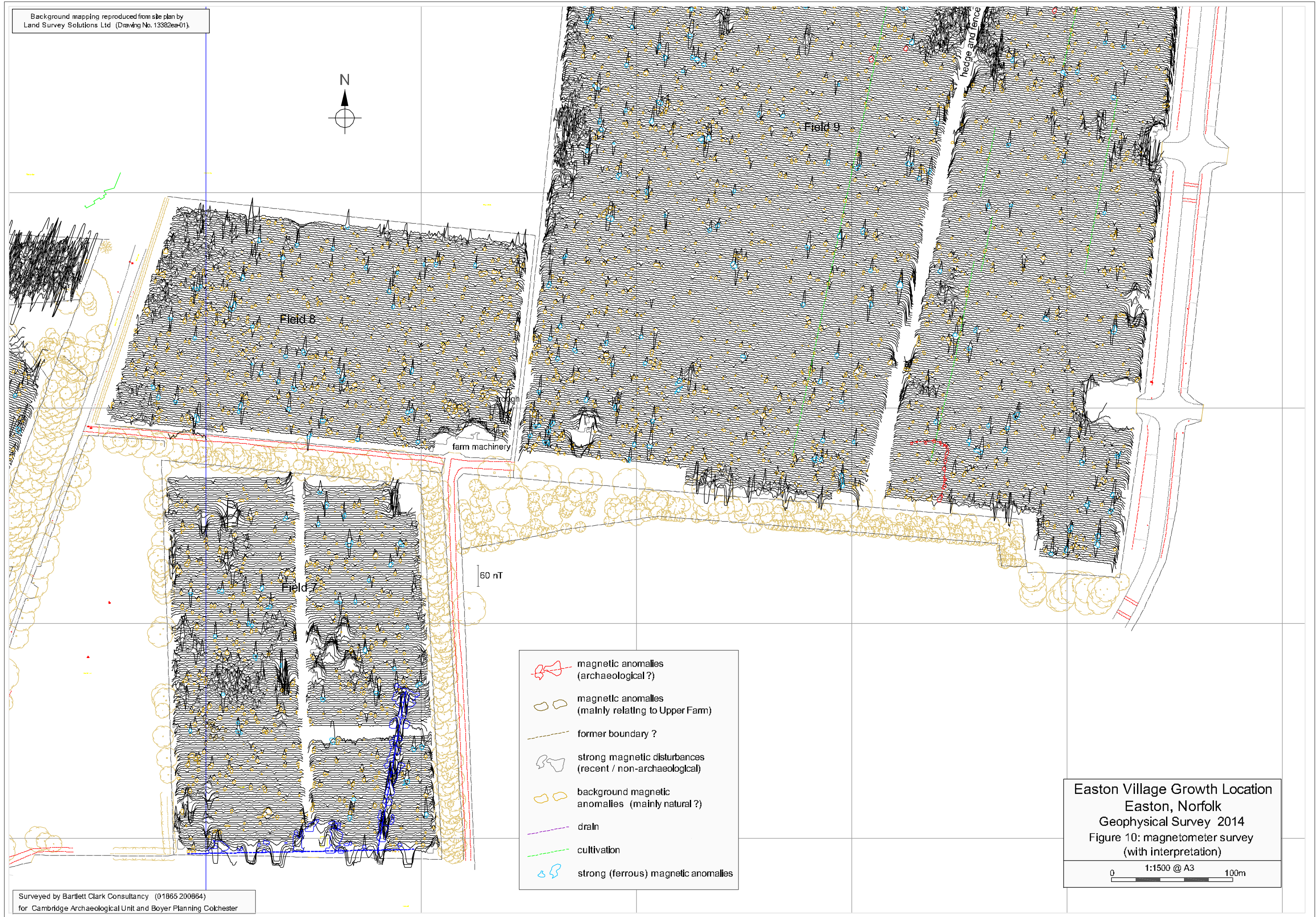
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-  cultivation
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Easton Village Growth Location
Easton, Norfolk
Geophysical Survey 2014
Figure 9: magnetometer survey
(with interpretation)

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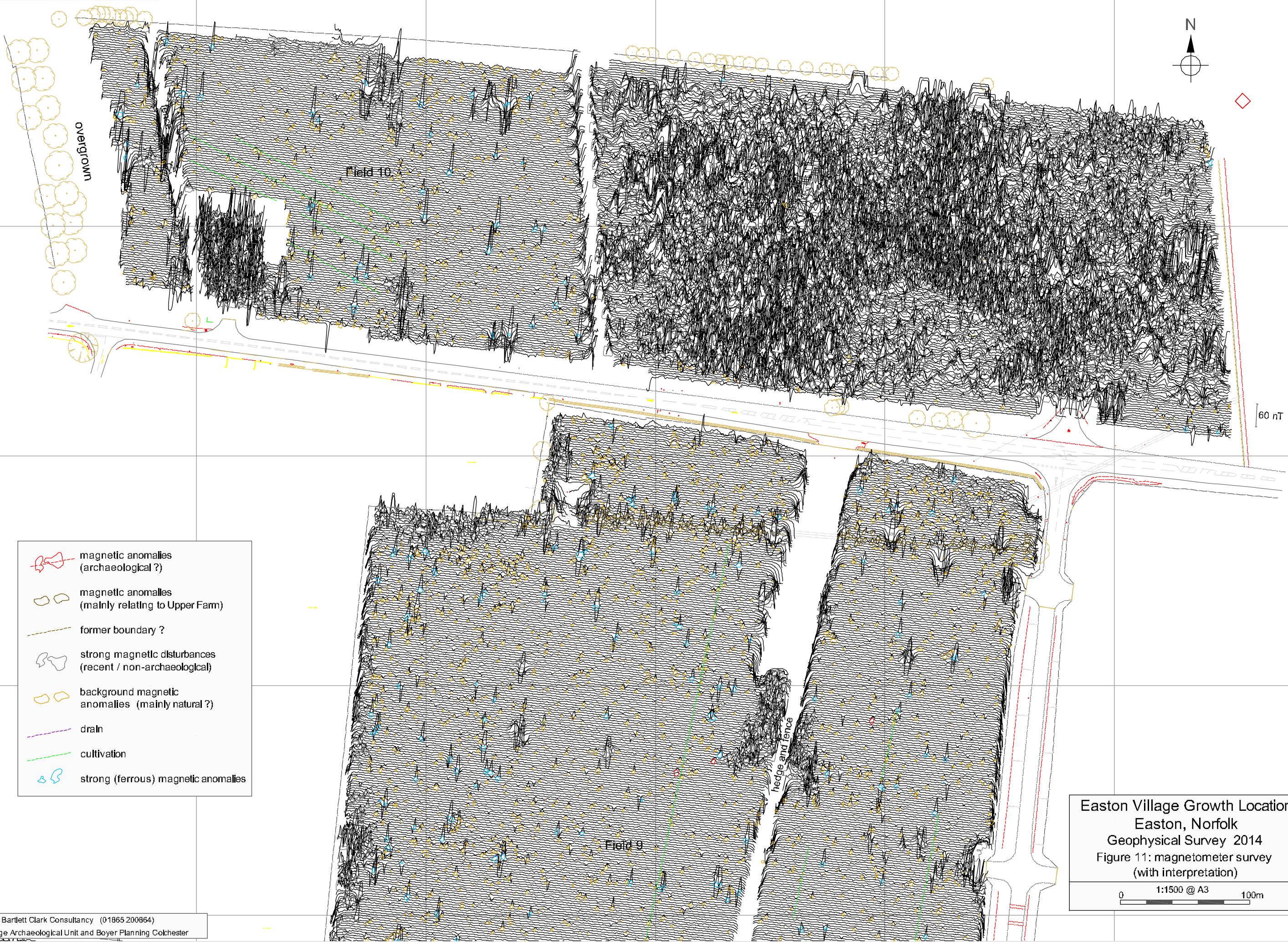
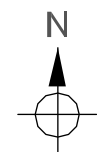










60 nT

-  magnetic anomalies (archaeological ?)
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-  cultivation
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Easton Village Growth Location
Easton, Norfolk
Geophysical Survey 2014
Figure 10: magnetometer survey
(with interpretation)

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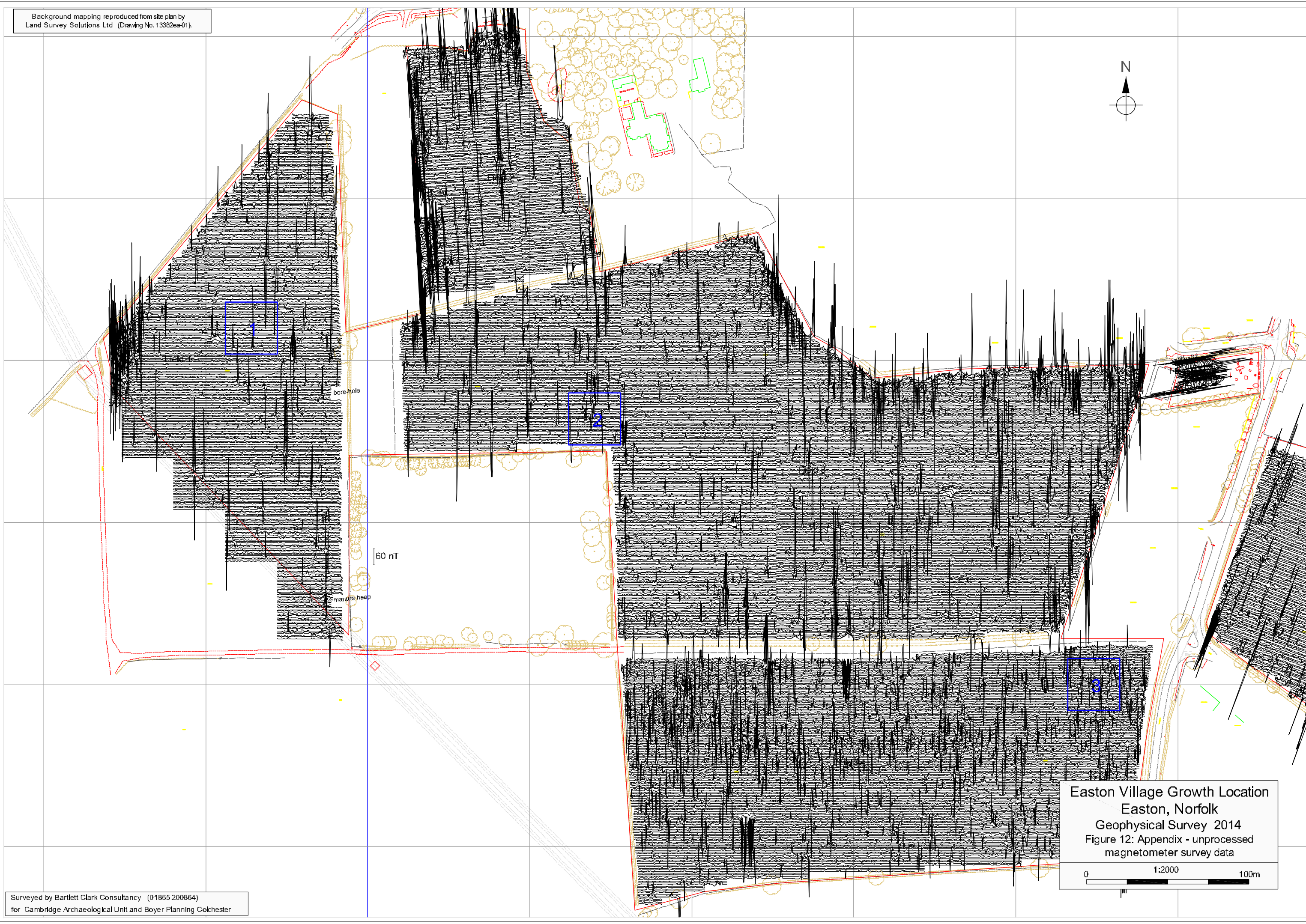
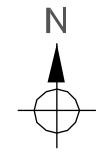


-  magnetic anomalies (archaeological ?)
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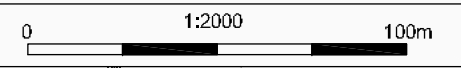
Easton Village Growth Location
Easton, Norfolk
Geophysical Survey 2014
Figure 11: magnetometer survey
(with interpretation)

0 1:1500 @ A3 100m

Background mapping reproduced from site plan by
Land Survey Solutions Ltd (Drawing No. 13382ea-01).

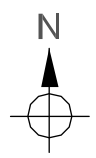


Easton Village Growth Location
Easton, Norfolk
Geophysical Survey 2014
Figure 12: Appendix - unprocessed
magnetometer survey data

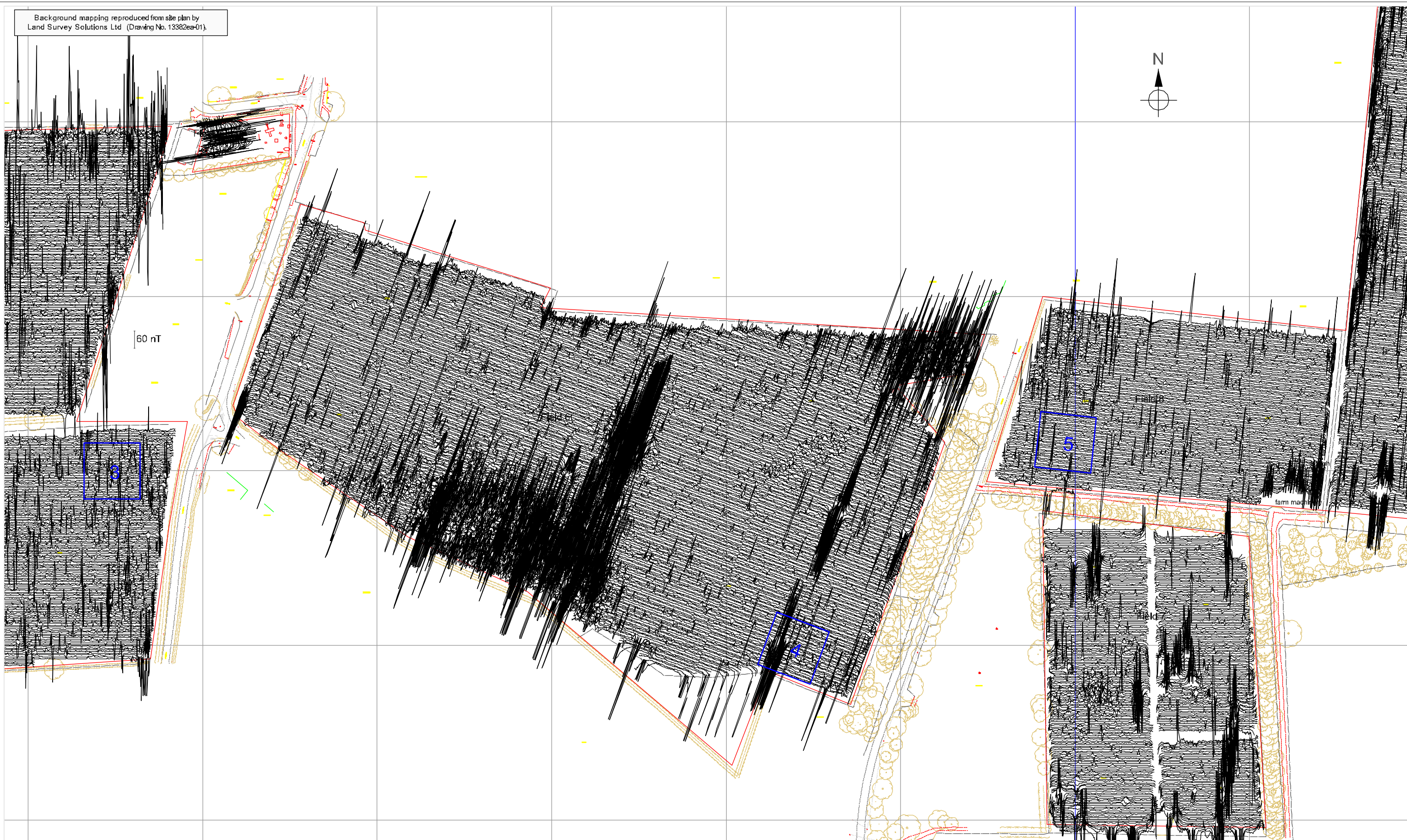


Surveyed by Bartlett Clark Consultancy (01865 200864)
for Cambridge Archaeological Unit and Boyer Planning Colchester

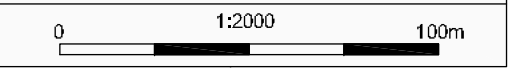
Background mapping reproduced from site plan by
Land Survey Solutions Ltd (Drawing No. 13382ea-01).



60 nT

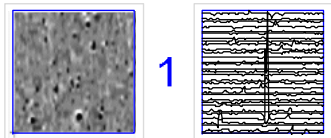


Easton Village Growth Location
Easton, Norfolk
Geophysical Survey 2014
Figure 13: Appendix - unprocessed
magnetometer survey data

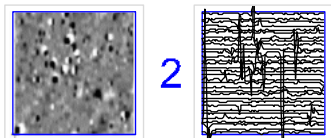


Surveyed by Bartlett Clark Consultancy (01865 200864)
for Cambridge Archaeological Unit and Boyer Planning Colchester

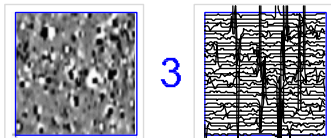
Background mapping reproduced from site plan by
Land Survey Solutions Ltd (Drawing No. 13382ea-01).



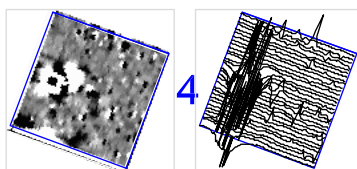
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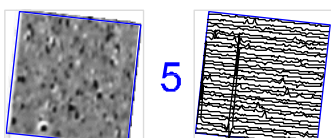
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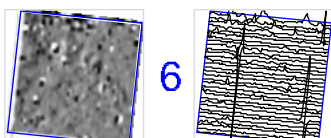
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4

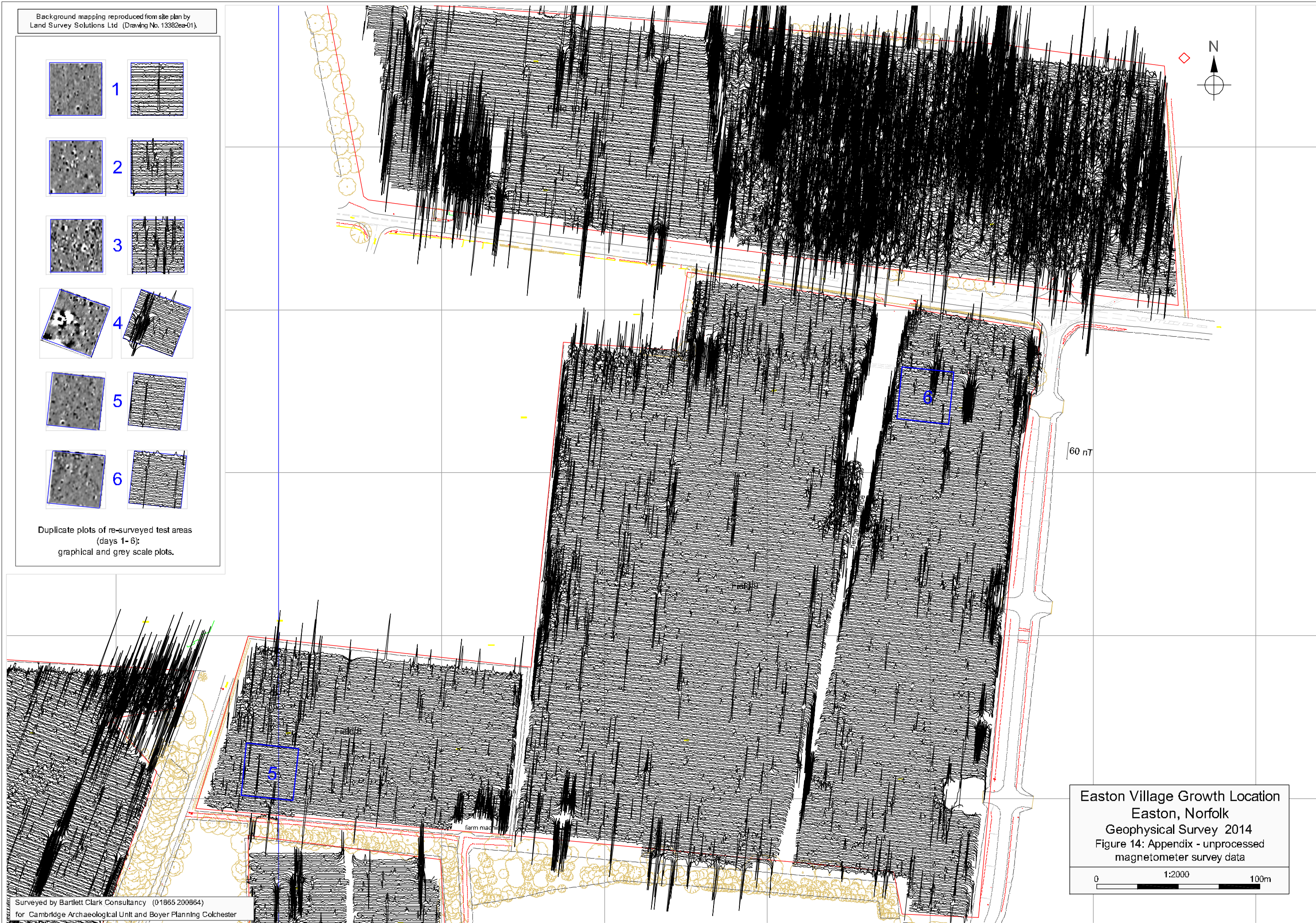


5



6

Duplicate plots of re-surveyed test areas
(days 1-6):
graphical and grey scale plots.



Easton Village Growth Location
Easton, Norfolk
Geophysical Survey 2014
Figure 14: Appendix - unprocessed
magnetometer survey data

