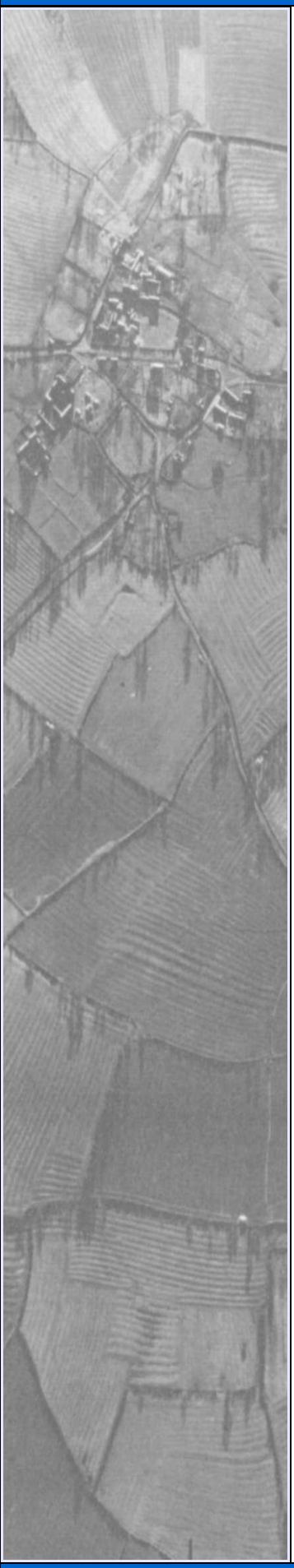

Land north of Church House
Blyth Road
Snape, Suffolk

MAGNETOMETER SURVEY REPORT

for

Archaeological Solutions

David Sabin and Kerry Donaldson

December 2012

Ref. no. 447

ARCHAEOLOGICAL SURVEYS LTD

Land north of Church House
Blyth Road
Snape, Suffolk

Magnetometer Survey Report

for

Archaeological Solutions

Fieldwork by David Sabin
Report by David Sabin BSc (Hons) MIFA and Kerry Donaldson BSc (Hons)

Survey date – 7th December 2012
Ordnance Survey Grid Reference – **TM 39445 58545**

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SUMMARY

A detailed magnetometer survey was undertaken by Archaeological Surveys Ltd at the request of Archaeological Solutions over an area of land in Snape, Suffolk. The area has been identified as of archaeological potential due to cropmarks indicating boundary ditches and an enclosure extending across the adjacent field and into the survey area. The survey located several linear anomalies within the northern part of the site, including one orientated almost east west and others north east to south west. It is possible that these relate to cut ditch-like features and they may have an association with the cropmarks. Two discrete positive anomalies, also located in the northern part of the site, have a moderately enhanced response that may indicate burning. Further positive linear and discrete responses exist within the site, and although they may relate to natural or agricultural features, it is not possible to confidently determine their origin.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by Archaeological Solutions to undertake a magnetometer survey of an area of land at Snape in Suffolk. The site has been outlined for a proposed residential development (Planning Application Number C/11/0967) and the survey forms part of an archaeological assessment of the site.

1.2 Survey objectives and techniques

1.2.1 The objective of the survey was to use magnetometry to locate geophysical anomalies that may be archaeological in origin so that they may be assessed prior to development of the site. The methodology is considered an efficient and effective approach to archaeological prospection.

1.2.2 The survey was carried out in accordance with a brief issued by Jess Tipper, Archaeological Officer for Suffolk County Council. The survey and report generally follow the recommendations set out by: English Heritage (2008) *Geophysical survey in archaeological field evaluation;* and Institute for Archaeologists (2002) *The use of Geophysical Techniques in Archaeological Evaluations*. The work has been carried out to the Institute for Archaeologists (2011) *Standard and Guidance for Archaeological Geophysical Survey.*

1.3 Site location, description and survey conditions

1.3.1 The site is located to the west of Blyth Road in Snape, Suffolk. It is centred on Ordnance Survey National Grid Reference (OS NGR) TW 39445 58545, see Figures 01 and 02.

1.3.2 The geophysical survey covers approximately 1.5ha within an area of mainly flat pasture approximately 270m by 60m. The northern end of the field appeared to have been possibly quarried with a steep-sided hollow containing brambles and partly unsuitable for survey. The ground cover was long grass with small clumps of briar and nettles.

1.3.3 The ground conditions across the site were mostly favourable for the collection of magnetometry data. Weather conditions during the survey were extremely poor with heavy snowfall, producing a covering up to 4cm deep, later turning to heavy rain and high winds.

1.4 Site history and archaeological potential

1.4.1 The Suffolk Historic Environment Record indicates that the site is located within an area of potential former occupation, with cropmarks that suggest a rectangular enclosure located in the field immediately to the west with boundary ditches extending into the survey area (SNP 032). The features have not been subject to detailed investigation and it is possible that the geophysical survey could locate anomalies that may relate to these features.

1.5 Geology and soils

1.5.1 The underlying geology is Crag Group – sand with overlying deposits of glacial sands and gravels from the Lowestoft Formation in the northern half of the survey area (BGS, 2012).

1.5.2 The overlying soils across the site are from the Newport 4 association which are typical brown sands. These consist of deep, well drained sandy soils formed over glaciofluvial drift (Soil Survey of England and Wales, 1983).

1.5.3 Detailed magnetometry carried out over similar soils and geology has demonstrated useful contrast between the magnetically enhanced fill of cut features and the material into which they are cut. However, the soils can also contain naturally formed pit-like and linear anomalies that may be difficult to distinguish from those with an anthropogenic origin.

2 METHODOLOGY

2.1 Technical synopsis

2.1.1 Magnetometry survey records localised magnetic fields that can be associated with features formed by human activity. Magnetic susceptibility and magnetic thermoremnance are factors associated with the formation of localised fields. Additional details are set out below and within Appendix A.

2.1.2 Iron minerals within the soil may become altered by burning and the break

down of biological material; effectively the magnetic susceptibility of the soil is increased, and the iron minerals become magnetic in the presence of the Earth's magnetic field. Accumulations of magnetically enhanced soils within features, such as pits and ditches, may produce magnetic anomalies that can be mapped by magnetic prospection.

2.1.3 Magnetic thermoremnance can occur when ferrous minerals have been heated to high temperatures such as in a kiln, hearth, oven etc. On cooling, a permanent magnetisation may be acquired due to the presence of the Earth's magnetic field. Certain natural processes associated with the formation of some igneous and metamorphic rock may also result in magnetic thermoremnance.

2.1.4 The localised variations in magnetism are measured as sub-units of the Tesla, which is a SI unit of magnetic flux density. These sub-units are nano Teslas (nT), which are equivalent to 10^{-9} Tesla (T).

2.2 Equipment configuration, data collection and survey detail

2.2.1 The detailed magnetic survey was carried out using Bartington Grad 601-2 gradiometers. The instruments effectively measure a magnetic gradient between two fluxgate sensors mounted vertically 1m apart. Two sets of sensors are mounted on a single frame 1m apart horizontally.

2.2.2 The instruments are extremely sensitive and are able to measure magnetic variation to 0.01nanoTesla (nT), with an effective resolution of 0.03nT. The data are limited to ±100nT when surveying with the highest sensitivity. All readings are saved to an integral data logger for analysis and presentation.

2.2.3 The instruments are operated according to the manufacturer's instructions with consideration given to the local conditions. An adjustment procedure is required, prior to collection of data, in order to balance the sensors and remove the effects of the Earth's magnetic field; further adjustment is required during the survey due to instrument drift often associated with temperature change.

2.2.4 It can be very difficult to obtain optimum balance for the sensors due to localised magnetic vectors that may be associated with large ferrous objects, geological/pedological features, 'magnetic debris' within the topsoil and natural temperature fluctuations. Imperfect balance results in a heading error often visible as striping within the data; this can be effectively removed by software processing and generally has little effect on the data unless extreme.

2.2.5 The Bartington gradiometers undergo regular servicing and calibration by the manufacturer. A current assessment of the instruments is shown in Table 1 below.

Sensor type and serial numbers	Bartington Grad - 01 – 1000 Nos. 084, 085, 242 and 396
Date of certified calibration/service	Sensors 084 and 085 - 17th August 2012 (due Aug 2014) Sensors 242 and 396 - 14th October 2011 (due Oct 2013)
Bandwidth	12Hz (100nT range) both sensors
Noise	<100pT peak to peak
Adjustable errors	<2nT

Table 1: Bartington fluxgate gradiometer sensor calibration results

The instruments were considered to be in good working order prior to the survey, with no known faults or defects.

2.2.6 Data were collected at 0.25m centres along traverses 1m apart. The survey area was separated into 30m by 30m grids (900m²) giving 3600 recorded measurements per grid. This sampling interval is very effective at locating archaeological features and is the recommended methodology for archaeological prospection (English Heritage, 2008).

2.2.7 The survey grids were set out to the Ordnance Survey OSGB36 datum using a Penmap RTK GPS. The GPS is used in conjunction with Leica's SmartNet service, where positional corrections are sent via a mobile telephone link. Positional accuracy of around 10 – 20mm is possible using the system. The instrument is regularly checked against the ETRS89 reference framework using Ordnance Survey ground marker C1ST7784 (Horton).

2.2.8 The fixed orientation of survey grids based on the OSGB36 datum was considered appropriate given that the orientation of land boundaries was variable (or other obstructions – name) and consequently partial survey grids were unavoidable. In addition, there is an optimum north – south traverse direction for magnetic survey (English Heritage, 2008). Survey in this direction can produce anomalies with a higher contrast when compared to other orientations; this is a function of their presence within the Earth's magnetic field. A fixed grid across the site also simplifies its relocation should that be required.

2.3 Data processing and presentation

2.3.1 Magnetometry data downloaded from the Grad 601-2 data logger are analysed and processed in specialist software known as ArcheoSurveyor. The software allows greyscale and trace plots to be produced for presentation and display. Survey grids are assembled to form an overall composite of data (composite file) creating a dataset of the complete survey area. Appendix C contains specific information concerning the survey and data attributes and is derived directly from ArcheoSurveyor; this should be used in conjunction with information provided by Figure 02.

2.3.2 Only minimal processing is carried out in order to enhance the results of the

survey for display. Raw data are always analysed, as processing can modify anomalies. The following schedule sets out the data and image processing used in this survey:

- clipping of the raw data at ±30nT to improve greyscale resolution,
- clipping of processed data at ±2nT to enhance low magnitude anomalies,
- zero median/mean traverse is applied in order to balance readings along each traverse.

Reference should be made to Appendix B for further information on the specific processes carried out on the data. Appendix C metadata includes details on the processing sequence used for the survey area.

2.3.3 An abstraction and interpretation is offered for all geophysical anomalies located by the survey. A brief summary of each anomaly, with an appropriate reference number, is set out in list form within the results (Section 3) to allow a rapid and objective assessment of features.

2.3.4 The main form of data display prepared for this report is the greyscale plot. Both 'raw' and 'processed' data have been shown followed by an abstraction and interpretation plot. Anomalies are abstracted using colour coded points, lines and polygons. All plots are scaled to landscape A3 for paper printing.

2.3.5 Graphic raster images in bitmap format (.BMP) are initially prepared in ArcheoSurveyor. Regardless of survey orientation, data captured along each traverse are displayed and processed by ArcheoSurveyor from left to right; this corresponds to a direction of west to east in the field and greyscale plots do not need to be rotated upon insertion into AutoCAD.

2.3.6 The raster images are combined with base mapping using ProgeCAD Professional 2009 and AutoCAD LT 2007, creating DWG file formats. All images are externally referenced to the CAD drawing in order to maintain good graphical quality. Quality can be compromised by rotation of graphics in order to allow the data to be orientated with respect to grid north; this is considered acceptable as the survey results are effectively georeferenced allowing relocation of features using GPS, resection method etc.

2.3.7 A digital archive is produced with this report, see Appendix D below. The main archive is held at the offices of Archaeological Surveys Ltd.

3 RESULTS

3.1 General assessment of survey results

3.1.1 The detailed magnetic survey was carried out over 1.5ha within a single field.

3.1.2 Magnetic anomalies located can be generally classified as positive and negative anomalies of an uncertain origin, anomalies associated with land management, areas of magnetic debris and disturbance and strong discrete dipolar anomalies relating to ferrous objects.

3.2 Statement of data quality

3.2.1 Data are considered representative of the magnetic anomalies present within the site. No significant defects are present within the data. The results suggest sufficient magnetic contrast exists within the soils for the location of former cut features.

3.2.2 Severe magnetic disturbance was encountered at the southern end of the site and this has been caused by modern services. The disturbance has the potential to obscure weak anomalies if they are present.

3.2.3 Some very small parts of the site were unsurveyable due to patches of briar. In addition, snow cover through part of the survey period produced very slippy conditions and has the potential to create small positional errors; however, no significant positional errors are apparent within the dataset.

3.3 Data interpretation

3.3.1 The list of sub-headings below attempts to define a number of separate categories that reflect the range and type of features located during the survey. A basic explanation of the characteristics of the magnetic anomalies is set out for each category in order to justify interpretation, a basic key is indicated to allow cross referencing to the abstraction and interpretation plot. CAD layer names are included to aid reference to associated digital files (.dwg/.dxf). Sub-headings are then used to group anomalies with similar characteristics for each survey area.

Report sub-heading CAD layer names and plot colour	**Description and origin of anomalies**
Anomalies with an uncertain origin AS-ABST MAG POS LINEAR UNCERTAIN AS-ABST MAG NEG LINEAR UNCERTAIN AS-ABST MAG POS DISCRETE UNCERTAIN 	The category applies to a range of anomalies where there is not enough evidence to confidently suggest an origin. Anomalies in this category may well be related to archaeologically significant features, but equally relatively modern features, geological/pedological features and agricultural features should be considered. Positive anomalies are indicative of magnetically enhanced soils that may form the fill of 'cut' features or may be produced by accumulation within layers or 'earthwork' features; soils subject to burning may also produce positive anomalies. Negative anomalies are produced by material of comparatively low magnetic susceptibility such as stone and subsoil.
Anomalies relating to land management AS-ABST MAG BOUNDARY	Anomalies are mainly linear and may be indicative of the magnetically enhanced fill of cut features (i.e. ditches). The anomalies may be long and/or form rectilinear elements and they may relate to topographic features or be visible on early mapping. Associated agricultural anomalies (e.g. headlands, plough marks and former ridge and furrow) may support the interpretation.

Anomalies with an agricultural origin AS-ABST MAG AGRICULTURAL 	The anomalies are often linear and form a series of parallel responses or are parallel to extant land boundaries. Where the response is broad, former ridge and furrow is likely; narrow response is often related to modern ploughing.
Anomalies associated with magnetic debris AS-ABST MAG DEBRIS  AS-ABST MAG STRONG DIPOLAR 	Magnetic debris often appears as areas containing many small dipolar anomalies that may range from weak to very strong in magnitude. It often occurs where there has been dumping or ground make-up and is related to magnetically thermoremnant materials such as brick or tile or other small fragments of ferrous material. This type of response is occasionally associated with kilns, furnace structures, or hearths and may therefore be archaeologically significant. It is also possible that the response may be caused by natural material such as certain gravels and fragments of igneous or metamorphic rock. Strong discrete dipolar anomalies are responses to ferrous objects within the topsoil.
Anomalies with a modern origin AS-ABST MAG DISTURBANCE 	The magnetic response is often strong and dipolar indicative of ferrous material and may be associated with extant above surface features such as wire fencing, cables, pylons etc.. Often a significant area around such features has a strong magnetic flux which may create magnetic disturbance; such disturbance can effectively obscure low magnitude anomalies if they are present. Fluxgate sensors may respond erratically and with hysteresis adjacent to strong magnetic sources. Buried services may produce characteristic multiple dipolar anomalies dependant upon their construction.

Table 2: List and description of interpretation categories

3.4 List of anomalies

Area centred on OS NGR 639445 258545, see Figures 04 & 05.

Anomalies with an uncertain origin

(1) – A positive linear anomaly crosses the central part of the survey area with an east – west orientation. The response is between 2nT and 4nT and it appears to relate to a cut feature with a magnetically enhanced fill, such as a boundary ditch, and an archaeological origin should be considered.

(2) – A positive linear, or possible rectilinear, anomaly is located within the northern part of the survey area and is oriented north east to south west. It is possible that it continues south westwards as two pit-like anomalies and it may have some association with anomalies (3) and (4) to the north. The anomalies may be associated with a hollow in this part of the site.

(3) – Negative linear or possible rectilinear anomalies, located immediately north of anomaly (2), indicate material with low magnetic susceptibility, such as stone or subsoil. It is difficult to determine their exact form due to restricted data collection at the northern end of the site.

(4) – Positive anomalies located to the north of anomalies (2) and (3) are a

response to magnetic enhancement in the region of 2-3nT.

(5) – Very weakly positive linear anomalies with some rectilinear elements are located immediately west of anomalies (2) and (3). It is possible that they are associated with agricultural activity, but this is not certain.

(6) – Two parallel positive linear anomalies extend across the northern part of the survey area and are oriented east to west. They appear to continue across the entire northern part of the site and may relate to cut features.

(7) – Positive and negative linear anomalies at the northern edge of the survey area are parallel with the northern field boundary and may be associated with it, or relate to agricultural practices.

(8) – Two discrete positive responses are located in the north western part of the survey area, to the south of anomaly (2). They have a response of over 10nT, peaking at 33nT, which indicates moderately high levels of enhancement, and may indicate burning. While a modern origin is possible for these anomalies, an archaeological origin should also be considered.

(9) – The survey area contains a number of discrete positive anomalies with a response of 2-3nT. While these may indicate pit-like features, it is not possible to determine if they are anthropogenically or naturally formed.

(10) – Positive linear anomalies generally with a north-south trend. It is possible that some of these anomalies relate to former cultivation.

Anomalies associated with land management

(11) – Three parallel positive linear anomalies with a west-north-west to east-south-east orientation are located in the central part of the survey area. They appear to be in the vicinity of a former field boundary removed during the 20th century and are likely to be associated.

Anomalies with an agricultural origin

(12) – Parallel linear anomalies extending north-south throughout much of the survey area relate to former cultivation.

Anomalies associated with magnetic debris

(13) – A patch of magnetic debris is located to the south of anomaly (1). This is a response to a spread of magnetically thermoremnant material, although the origin of the material is uncertain.

(14) – The survey area contains numerous strong discrete dipolar anomalies that are responses to ferrous objects within the topsoil.

Anomalies with a modern origin

(15) – A zone of magnetic disturbance is evident around the southern part of the survey area. It is a response to a buried service or pipe, or other ferrous material within or adjacent to the survey area.

4 CONCLUSION

4.1.1 The detailed magnetometer survey located a number of geophysical anomalies within the survey area. The majority of the anomalies could not be confidently interpreted and consist of linear and discrete responses. The general trend is for an increased number of anomalies in the northern half of the site.

4.1.2 A positive linear anomaly (labelled 1) extends from east to west across the site and may relate to a former field boundary ditch that pre-dates any mapped boundaries. It is possible that it is associated with a cropmark boundary recorded from aerial photographs (SNP 032). Three parallel linear anomalies within the centre of the site appear to be associated with a field boundary removed during the 20th century.

4.1.3 In the northern part of the survey area there are a number of positive and negative responses that appear to surround and possibly be associated with a hollow, although their origin is uncertain. There is some potential for the anomalies to be associated with linear ditches recorded from cropmarks (SNP 032). Two pit-like anomalies in the northern part of the site (labelled 8) have a response of between 10nT and 30nT which may indicate burning.

5 REFERENCES

British Geological Survey, 2012. *Geology of Britain viewer, 1:50 000 scale [online]* available from http://maps.bgs.ac.uk/geologyviewer/ [accessed 12/12/2012].

English Heritage, 2008. *Geophysical survey in archaeological field evaluation. Research and Professional Service Guideline No.1.* 2nd ed. Swindon: English Heritage.

Institute for Archaeologists, 2002. *The use of Geophysical Techniques in Archaeological Evaluations*. IfA Paper No. 6. IfA, University of Reading.

Institute for Archaeologists, 2011. *Standard and Guidance for archaeological geophysical survey*. IfA, University of Reading.

Soil Survey of England and Wales, 1983. *Soils of England and Wales, Sheet 4 Eastern England.*

Appendix A – basic principles of magnetic survey

Iron minerals are always present to some degree within the topsoil and enhancement associated with human activity is related to increases in the level of magnetic susceptibility and thermoremnant material.

Magnetic susceptibility is an induced magnetism within a material when it is in the presence of a magnetic field. This can be thought of as effectively permanent due to the presence of the Earth's magnetic field.

Thermoremnant magnetism occurs when ferrous material is heated beyond a specific temperature known as the Curie Point. Demagnetisation occurs at this temperature with re-magnetisation by the Earth's magnetic field upon cooling.

Enhancement of magnetic susceptibility can occur in areas subject to burning and complex fermentation processes on biological material; these are frequently associated with human settlement. Thermoremnant features include ovens, hearths, and kilns. In addition thermoremnant material such as tile and brick may also be associated with human activity and settlement.

Silting and deliberate infilling of ditches and pits with magnetically enhanced soil can create an area of enhancement compared with surrounding soils and subsoils into which the feature is cut. Mapping enhanced areas will produce linear and discrete anomalies allowing an assessment and characterisation of hidden subsurface features.

It should be noted that areas of negative enhancement can be produced from material having lower magnetic properties compared to the topsoil. This is common for many sedimentary bedrocks and subsoils which were often used in the construction of banks and walls etc. Mapping these 'negative' anomalies may also reveal archaeological features.

Magnetic survey or magnetometry can be carried out using a fluxgate gradiometer and may be referred to as gradiometry. The gradiometer is a passive instrument consisting of two fluxgate sensors mounted vertically 1m apart. The instrument is carried about 30cm above the ground surface and the upper sensor measures the Earth's magnetic field as does the lower sensor but this is influenced to a greater degree by any localised buried field. The difference between the two sensors will relate to the strength the magnetic field created by the buried feature. If no enhanced feature is present the field measured by both sensors will be similar and the difference close to zero.

There are a number of factors that may affect the magnetic survey and these include soil type, local geology and previous human activity. Situations arise where magnetic disturbance associated with modern services, metal fencing, dumped waste material etc., obscures low magnitude fields associated with archaeological features.

Appendix B – data processing notes

Clipping

Minimum and maximum values are set and replace data outside of the range with those values. Extreme values are removed improving colour or greyscale contrast associated with data values that may be archaeologically significant. It has been found that clipping data to ranges between ±5nT and ±1nT often improves the appearance of features associated with archaeology. Different ranges are applied to data in order to determine the most suitable for anomaly abstraction and display.

Zero Median/Mean Traverse

The median (or mean) of each traverse is calculated ignoring data outside a threshold value, the median (or mean) is then subtracted from the traverse. The process is used to equalise slight differences between the set-up and stability of gradiometer sensors and can remove striping. The process can remove archaeological features that run along a traverse so data analysis is also carried out prior its application.

De-stagger

Compensates for small positional errors within data collection by shifting the position of the readings along each traverse by a specified amount. Data lost at the end of each traverse are extrapolated from adjacent value in the same row.

Deslope

Corrects for striping and distortion caused by metal objects/services etc.. The process calculates a curve based on a polynomial best fit mathematical function for each traverse. This curve is then subtracted from the actual data.

Edge Match

Calculates the mean of the 2 lines (rows or columns) of data either side of the edge to match. It then subtracts the difference between the means from all datapoints in the selected area.

FFT (Fast Fourier Transform) spectral filtering

A mathematical process used to determine the frequency components of a traverse. Repetitive features, such as plough marks, produce characteristic spectral zones that can be suppressed allowing greyscale images to appear clearer.

Appendix C – survey and data information

Raw magnetometer data

COMPOSITE
Filename: J447-mag-raw.xcp
Instrument Type: Bartington (Gradiometer)
Units: nT
Surveyed by: on 08/12/2012
Assembled by: on 08/12/2012
Direction of 1st Traverse: 90 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702

Dimensions
Composite Size (readings): 360 x 300
Survey Size (meters): 90 m x 300 m
Grid Size: 30 m x 30 m
X Interval: 0.25 m
Y Interval: 1 m

Stats
Max: 30.00
Min: -30.00
Std Dev: 6.96
Mean: -1.33
Median: 0.32
Composite Area: 2.7 ha
Surveyed Area: 1.3461 ha

PROGRAM
Name: ArcheoSurveyor
Version: 2.5.19.3

Processes: 2
1 Base Layer
2 Clip from -30.00 to 30.00 nT

Source Grids: 29
1 Col:0 Row:0 grids\29.xgd
2 Col:0 Row:1 grids\19.xgd
3 Col:0 Row:2 grids\20.xgd
4 Col:0 Row:3 grids\21.xgd
5 Col:0 Row:4 grids\22.xgd
6 Col:0 Row:5 grids\11.xgd
7 Col:0 Row:6 grids\12.xgd
8 Col:0 Row:7 grids\13.xgd
9 Col:0 Row:8 grids\14.xgd
10 Col:1 Row:0 grids\28.xgd
11 Col:1 Row:1 grids\15.xgd
12 Col:1 Row:2 grids\16.xgd
13 Col:1 Row:3 grids\17.xgd
14 Col:1 Row:4 grids\18.xgd
15 Col:1 Row:5 grids\01.xgd
16 Col:1 Row:6 grids\02.xgd
17 Col:1 Row:7 grids\03.xgd
18 Col:1 Row:8 grids\04.xgd
19 Col:1 Row:9 grids\05.xgd
20 Col:2 Row:0 grids\27.xgd
21 Col:2 Row:1 grids\23.xgd
22 Col:2 Row:2 grids\24.xgd
23 Col:2 Row:3 grids\25.xgd
24 Col:2 Row:4 grids\26.xgd
25 Col:2 Row:5 grids\06.xgd
26 Col:2 Row:6 grids\07.xgd
27 Col:2 Row:7 grids\08.xgd
28 Col:2 Row:8 grids\09.xgd
29 Col:2 Row:9 grids\10.xgd

Processed magnetometer data

COMPOSITE
Filename: J447-mag-proc.xcp

Stats
Max: 2.00
Min: -2.00
Std Dev: 0.95
Mean: -0.20
Median: -0.10
Composite Area: 2.7 ha
Surveyed Area: 1.3461 ha

Processes: 5
1 Base Layer
2 DeStripe Mean Traverse: Grids: 22.xgd 11.xgd 12.xgd 13.xgd 14.xgd 18.xgd 01.xgd 02.xgd 03.xgd 04.xgd 05.xgd 26.xgd 06.xgd 07.xgd 08.xgd 09.xgd 10.xgd Threshold: 0.5 SDs
3 DeStripe Mean Traverse: Grids: 29.xgd 19.xgd 20.xgd 28.xgd 15.xgd 16.xgd 27.xgd 23.xgd 24.xgd Threshold: 0.5 SDs
4 DeStripe Median Sensors: 21.xgd 17.xgd 25.xgd
5 Clip from -2.00 to 2.00 nT

Appendix D – digital archive

Archaeological Surveys Ltd hold the primary digital archive at their offices in Wiltshire (see inside cover for address). Data are backed-up onto an on-site data storage drive and at the earliest opportunity data are copied to CD ROM for storage on-site and off-site.

Surveys are reported on in hardcopy (recycled paper) using A4 for text and A3 for plots (all plots are scaled for A3). The distribution of both hardcopy report and digital data is considered the responsibility of the Client unless explicitly stated in the survey Brief, Written Scheme of Investigation or other contractual agreement.

This report has been prepared using the following software on a Windows XP platform:

- ArcheoSurveyor version 2.5.19.3 (geophysical data analysis),
- ProgeCAD Professional 2009 (report graphics),
- AutoCAD LT 2007 (report figures),
- OpenOffice.org 3.0.1 Writer (document text),
- PDF Creator version 0.9 (PDF archive).

Digital data produced by the survey and report include the following files:

- ArcheoSurveyor grid and composite files for all geophysical data,
- CSV files for raw and processed composites,
- geophysical composite file graphics as Bitmap images,
- AutoCAD DWG files in 2000 and 2007 versions,
- report text as OpenOffice.org ODT file,
- report text as Word 2000 doc file,
- report text as rich text format (RTF),
- report text as PDF,
- PDFs of all figures.

Archaeological Surveys Ltd

Geophysical Survey
Land north of Church House
Blyth Road
Snape, Suffolk

Map of survey area

Survey location

Survey location

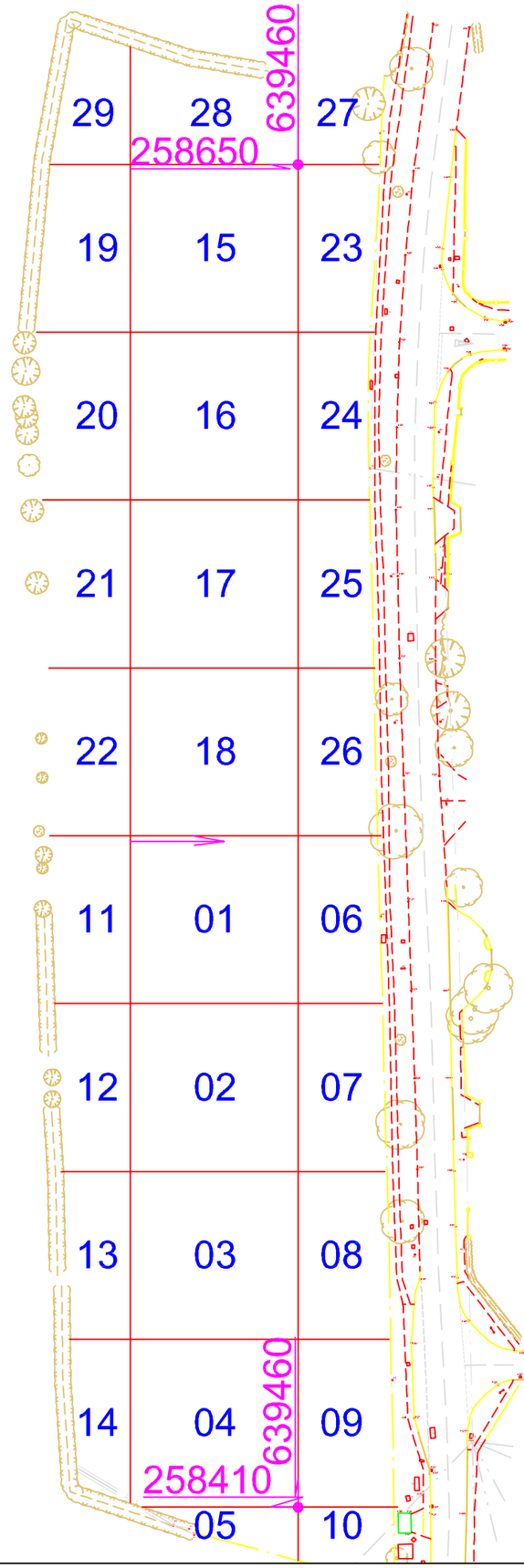
Site centred on OS NGR
TM 39445 58545

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

FIG 01



N

Archaeological Surveys Ltd

Geophysical Survey
Land north of Church House
Blyth Road
Snape, Suffolk

Referencing information

Grid coordinates based on Ordnance Survey OSGB36 datum

Grids set out using RTK GPS with Leica SmartNet correction data RTCMv2 format OSTN02 transformation

Survey grid size = 30m

Survey start and traverse direction

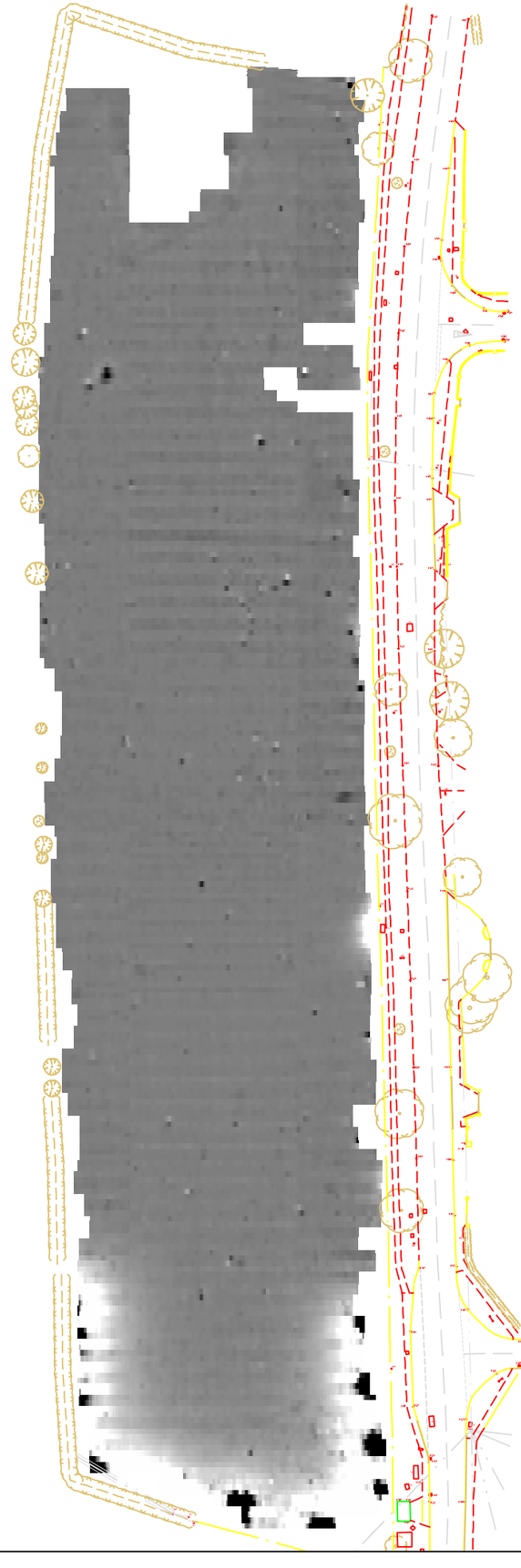
01 Grid reference number and filename

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 02



N

Archaeological Surveys Ltd

Geophysical Survey
Land north of Church House
Blyth Road
Snape, Suffolk

Greyscale plot of raw magnetometer data

+30nT

-30nT +30nT

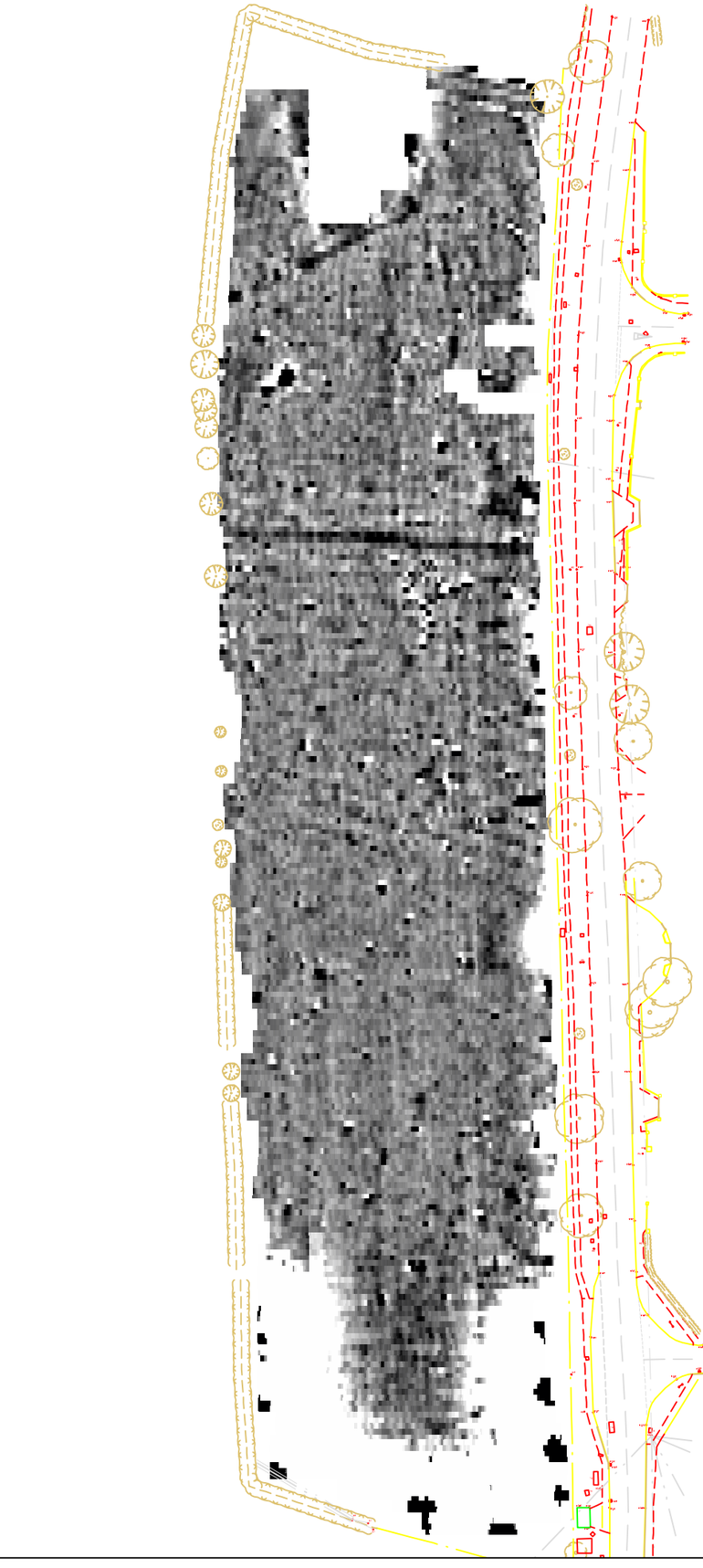
-30nT

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 03



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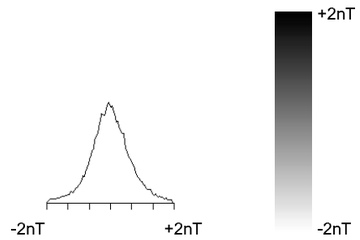
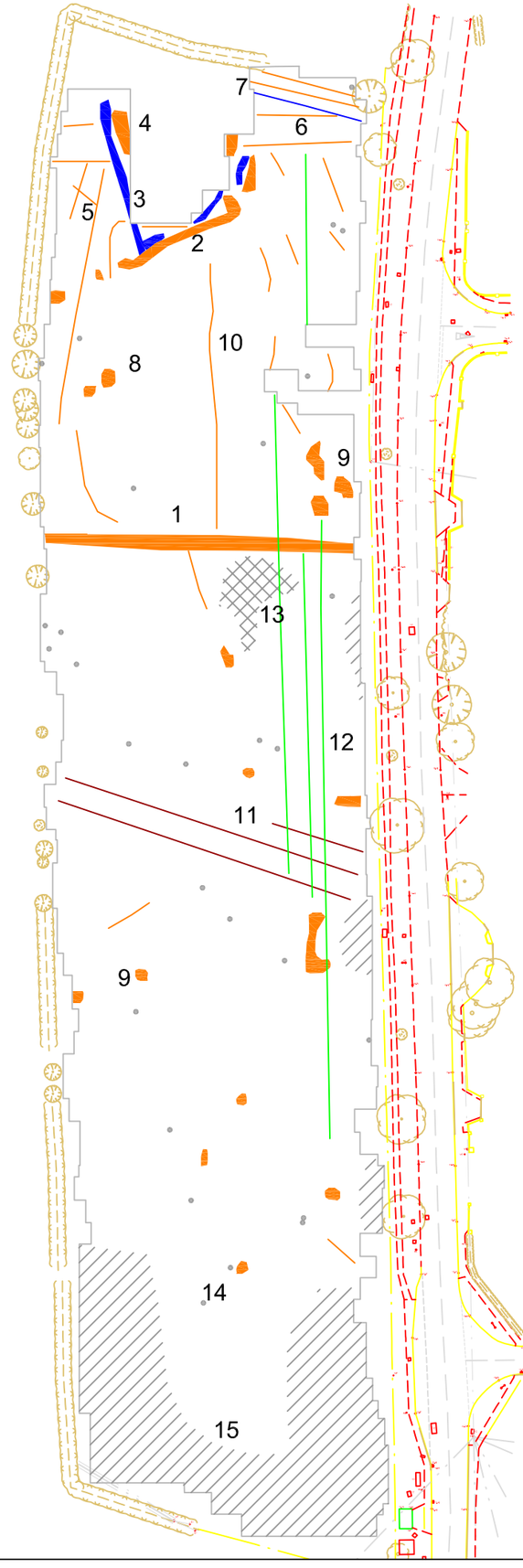
Greyscale plot of processed magnetometer data



SCALE 1:1000

SCALE TRUE AT A3

FIG 04



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Abstraction and interpretation of magnetometer anomalies

- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - of agricultural origin
- Positive linear anomaly - possible former field boundary
- Negative linear anomaly - material of low magnetic susceptibility
- Discrete positive response - possible pit-like feature
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong dipolar anomaly - ferrous object

SCALE 1:1000

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 05