

**Detailed Magnetometer Survey
Land at 88 Folders Lane
Burgess Hill, West Sussex**

**NGR: 532798 117844
(TQ 32798 17844)**

**Mid Sussex District Council
Planning Reference: 14/04492/FUL
Planning Inspectorate Appeal Reference
APP/D3830/W/16/3149456
Site Code: FDL17
OASIS ID: archaeol6-298052
ASE Project No: 170737
ASE Report No: 2017436**




By John Cook

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Abstract

Archaeology South-East (ASE), the contracting division of The Centre for Applied Archaeology at the Institute of Archaeology, University College London (UCL), was commissioned by Jones Homes (Southern) Ltd to undertake a geophysical survey on Land at 88 Folders Lane, Burgess Hill, NGR 532798 117844. The work was undertaken between Tuesday 3rd October and Thursday 5th October 2017.

Evidence for possible archaeological features was represented by moderate positive anomalies. A large linear strong positive anomaly is observed that may indicate a cut feature such as a ditch. Magnetic debris and associated probable cut features run across the site in an approximate south-west to north-east orientation. These anomalies correspond to a former boundary noted on the 1839 Ditchling tithe map. A series of indistinct but broad linear anomalies run in an approximate east to west orientation across the site. These anomalies are indicative of former agricultural practices such as ridge and furrow. The anomalies are observed with alignments continuing across the site and are therefore likely to pre-date the aforementioned former boundary. Later ploughing is indicated by parallel anomalies aligned with the former field boundary. Further east to west oriented anomalies are noted in the north of the site.

Statement of Indemnity

Geophysical survey is the collection of data that relate to subtle variations in the form and nature of soil and which relies on there being a measurable difference between buried archaeological features and the natural geology. Geophysical techniques do not specifically target archaeological features and anomalies noted in the interpretation do not necessarily relate to buried archaeological features. As a result, magnetic and earth resistance detail survey may not always detect sub-surface archaeological features. This is particularly true when considering earlier periods of human activity, for example those periods that are not characterised by sedentary social activity.

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1.0 INTRODUCTION

1.1 Site background

1.1.1 Archaeology South-East (ASE) have been commissioned by Jones Homes (Southern) Ltd (hereafter 'the client') to undertake archaeological investigations, encompassing geophysical survey and trial trench evaluation, on land to the rear of 88 Folders Lane, Burgess Hill, (hereafter 'the site') centred on NGR 532798 117844; Figure 1.

1.1.2 A planning application has been submitted to Mid Sussex District Council (MSDC Reference 14/04492/FUL) and was approved on appeal (reference APP/D3830/W/16/3149456) for the demolition of 88 Folders Lane and the development of 73 residential dwellings (of a mixture of 2, 3, 4 and 5 beds), including 30 percent affordable housing and associated infrastructure. Condition 8 of the appeal consent states:

No development shall take place until the applicant has secured the implementation of a programme of archaeological work in accordance with a Written Scheme of Investigation which has been submitted by the applicant and approved in writing by the local planning authority.

1.1.3 A Written Scheme of Investigation (WSI) for a geophysical survey and archaeological evaluation by trenching (ASE 2017) was prepared accordingly.

1.2 Geology and topography

1.2.1 According to the online British Geological Survey 1:50,000 mapping, the bedrock geology of the site consists of Weald Clay Formation - sandstone and mudstone. No superficial geology recorded (BGS 2017).

1.2.2 The survey area consisted of approximately 7 hectares of grassland to the south of Folders Lane on a gentle south-facing slope with views of the South Downs (Figure 2).

1.3 Aims of geophysical investigation

1.3.1 The geophysical survey comprised a detailed magnetometer survey within all accessible areas (as shown on Figure 2). The survey aimed to detect anomalies of possible archaeological origin within the boundaries of the survey area. The features detected were naturally limited to those features that produce a measurable response to the instrumentation used.

1.3.2 The general aims of the evaluation are:

- To define, insofar as possible, the nature, significance date, character, form and function of any archaeological features observed on site.
- To determine the survival, extent and minimum depth below modern ground level of any such remains.

- To allow the MSDC's Archaeological Advisors at SCC to define what, if any, archaeological mitigation should be considered in advance of or during development.

1.3.3 Site specific research aims are:

- To establish whether evidence of the prehistoric activity identified in close proximity to the site relates to settlement activity that might be impacted by the scheme.
- Is there any evidence of Roman activity, with particular reference to being contemporary with the vessel identified 1km to the south of the site.
- Is there any evidence for medieval agricultural practices on the site and can the development of such practices (e.g. woodland clearance, ridge and furrow, former field boundaries, etc) be identified and put into a chronological context.

1.4 Scope of report

- 1.4.1 The scope of this report is to detail the findings of the survey. The project was conducted by John Cook with the assistance of Sophie Morrish. The project was managed by Neil Griffin (fieldwork) and Dan Swift (post-fieldwork).

2.0 ARCHAEOLOGICAL BACKGROUND

2.1. Introduction

- 2.1.1 The results of the CgMs Archaeological Desk-Based Assessment (DBA; CgMs 2015) are summarised below.
- 2.1.2 The site lies immediately to the north-west of an Archaeological Notification Area, as designated by Lewes District Council, associated with the historic farm of Fragbarrow.

2.2 Prehistoric

- 2.2.1 Within a 1km of the site evidence of prehistoric activity from the early Neolithic, Bronze Age and Iron Age periods is recorded at a number of locations, the closest being on land at Folders Farm on the northern side of Folders Lane.

2.3 Romano-British

- 2.3.1 A small Roman bottle was found 1km south-east of the site but no other evidence of activity from this period is represented.

2.4 Medieval

- 2.4.1 No evidence dating to the Anglo Saxon period has been recorded within the vicinity of the site. A medieval farmstead known as 'Frekeberge' is recorded immediately to the south-east of the site but not thought to have extended into it. During the medieval period it is likely that the main body of the site was informal parkland, probably within the estate of Frekeberge and occupied by woodland or agricultural land, and then subject to piecemeal enclosure during later periods. A small medieval settlement has been recorded c. 750 to the south-east of the site and evidence of ridge and furrow agriculture has been recorded c. 900m to the north-east.

2.5 Post-medieval and modern

- 2.5.1 Many of the existing farms and homesteads within the vicinity of the site will have originated within the post-medieval period as the Wealden Forest began to be cleared and brought into cultivation. An archaeological evaluation undertaken at Folders Farm to the north of the study site recorded evidence of boundary ditches and tree throws suggesting enclosure and woodland clearance during this period (ASE 2007). An early 18th century brickworks, a trackway, a parkscape, a number of brickyards and brick fields and a number of historic farmsteads are recorded in the wider area but are not directly relevant to the site.
- 2.5.2 Cartographic sources from the late 18th century show the site was under agricultural regime from at least that time with little evidence of change to the present day with the exception of road side development along Folders Lane from the c. 1930s.
- 2.5.3 A review of aerial photographs did not identify any certain archaeological evidence but some indistinct linear features were noted within pasture at the north-eastern part of the site to the rear of properties fronting Folders Lane. These may be indicative of former garden or agricultural features which are no

longer in use (Airphoto Services 2015).

2.6 The Archive

- 2.6.1 The digital and paper archive derived from this project will be housed at Archaeology South-East's Sussex offices and will be combined with any further archive generated in the event of further fieldwork being required.

3.0 SURVEY METHODOLOGY

3.1 Geophysical survey

- 3.1.1 A fluxgate gradiometer (magnetometry) survey was undertaken across a single parcel of land as depicted on Figure 2. The work was undertaken between Tuesday 3rd and Thursday 5th October 2017 during clear and breezy weather with the occasional shower.

3.2 Applied geophysical instrumentation

- 3.2.1 The Fluxgate Gradiometer employed was the Bartington Instrumentation Grad 601-2. The Grad 601-2 has an internal memory and a data logger that store the survey data. This data is downloaded into a PC and is then processed in a suitable software package.
- 3.2.2 30m x 30m grids were set out using a GPS (see below). Each grid was surveyed with 1m traverses and samples were taken every 0.25m.
- 3.2.3 Data was collected along north-south traverses in a zigzag pattern beginning in the south west corner of each grid, following the contours of the site.

3.3 Instrumentation used for setting out the survey grid

- 3.3.1 The survey grid for the site was geo-referenced using a Leica Viva SmartRover. The GPS receiver collects satellite data to determine its position and uses the mobile phone networks to receive corrections, transmitting them to the RTK Rover via Bluetooth to provide a sub centimetre Ordnance Survey position and height. Each surveyed grid point has an Ordnance Survey position; therefore the geophysical survey can be directly referenced to the Ordnance Survey National Grid.

3.4 Data processing

- 3.4.1 All of the geophysical data processing was carried out using TerraSurveyor published by DW Consulting. Minimally processed data was produced using the following schedule of processing. Due to the very high positive readings of some of the magnetic disturbance, the values were replaced with a dummy value so as to avoid detrimentally affecting the dataset when further processed. The first process carried out upon the data was to apply a DESPIKE to the data set which removes the random 'iron spikes' that occur within fluxgate gradiometer survey data. A ZERO MEDIAN TRAVERSE was then applied to survey data. This removes stripe effects within grids and ensures that the survey grid edges match.

3.5 Data presentation

- 3.5.1 Data is presented using images exported from TerraSurveyor into AutoCAD software and inserted into the geo-referenced site grid. Data is presented as raw and processed data greyscale plots.

4.0 GEOPHYSICAL SURVEY RESULTS

4.1 Description of site

- 4.1.1 The survey area consisted of approximately 7 hectares of grassland located to the south of Folders Lane on a gentle south facing slope with views of the South Downs (Figure 2).

4.2 Survey limitations

- 4.2.1 Physical obstructions encountered on site included areas of overgrown vegetation with hidden dips and wire fences (Figures 2, 6 and 7). Obstructions for each area are noted in the results. In addition, the effectiveness of magnetometer surveys depends on a contrast between the absolute magnetic susceptibility of the topsoil to the underlying subsoil (Clark 1996). Features may also be difficult to detect where there has been significant primary silting and development of significant overburden. Areas where physical obstructions form a barrier to survey, or a health and safety issue, have been omitted. The site lies over Weald clay formation - sandstone and mudstone. The response to magnetometer survey is generally good over some Tertiary formations of sandstone and average over mudstones; but results can be variable (English Heritage 2008).

4.3 Introduction to results

- 4.3.1 The results should be read in conjunction with the figures at the end of this report. The types of features likely to be identified are discussed below.

Positive Magnetic Anomalies

- 4.3.2 Positive anomalies generally represent cut features that have been in-filled with magnetically enhanced material.

Negative Magnetic anomalies

- 4.3.3 Negative anomalies generally represent buried features such as banks or compacted ground that have a lower magnetic signature in comparison to the background geology.

Magnetic Disturbance

- 4.3.4 Magnetic disturbance is generally associated with interference caused by modern ferrous features such as fences and service pipes or cables.

Magnetic Debris

- 4.3.5 Low amplitude magnetic debris consists of a number of dipolar responses spread over an area and is indicative of ground disturbance.

Dipolar Anomalies

- 4.3.6 Dipolar anomalies are positive anomalies with an associated negative response. These anomalies are usually associated with discreet ferrous

objects or may represent buried kilns or ovens.

Bipolar Anomalies

- 4.3.7 Bipolar anomalies consist of alternating responses of positive and negative magnetic signatures. Interpretation will depend on the strength of these responses; modern pipelines and cables typically produce strong bipolar responses.

Thermoremanence

- 4.3.8 Thermoremanence is most commonly encountered through the magnetizing of clay through the firing process although stones and soils can also acquire thermoremanence.
- 4.3.9 Magnetism from ferromagnetic materials (iron) and from thermoremanence are forms of permanent magnetism and in most cases a magnetometer will not enable the separation of anomalies into the two categories. The interpretation of these anomalies into either category relies on field strength within an area. Magnetic anomalies due to iron normally rise and fall rapidly, forming a 'spike' in the data.

4.4 Interpretation of fluxgate gradiometer results (Figures 3-8)

- 4.4.1 The interpretation of fluxgate gradiometer results should be read in conjunction with the figures at the end of the report. Specific examples of anomaly types may be numbered in the figures and text but not all anomalies are numbered.
- 4.4.2 Evidence of possible archaeological activity included the following described anomalies (Figure 5). The most obvious possible archaeological anomalies are the linear and discrete moderate and strong positive anomalies and likely to be due to cut features such as pits and ditches (moderate coloured light green, strong dark green).
- 4.4.3 Areas of magnetic debris may relate to a scattering of near surface ferrous material, demolished buildings, former field boundaries, ground disturbance or made ground (dotted brown).
- 4.4.5 A scatter of dipolar anomalies (pink dots) relate to near surface ferrous (iron) objects.
- 4.4.6 Broadly linear and parallel but indistinct anomalies are aligned in an east to west orientation across the site (dark green hatched areas). These may relate to previous agricultural activity such as ridge and furrow.
- 4.4.7 Plough marks create linear anomalies that may be mistaken for ditches but are noted when more obvious (dark green dashed lines).

5.0 CONCLUSIONS

5.1 Discussion

- 5.1.1 Evidence for possible archaeological features was represented by moderate positive anomalies (A1) (coloured light green on Figure 5). Though they could have an archaeological origin, they may equally be the result of the natural geology. A large linear strong positive anomaly (A2) is observed that may indicate a cut feature such as a ditch. However, this anomaly may also result from a natural feature such as a palaeochannel.
- 5.1.2 Areas of magnetic debris are likely to be caused by ground disturbance. Magnetic debris and associated probable cut features (A3) run across the site in an approximate south-west to north-east orientation. These anomalies correspond to a former boundary noted on the 1839 Ditchling tithe map and still appearing on the 1985 Ordnance Survey National Grid 1:10000 map (National Grid tile TQ31NW). Remnants of this boundary are still present on site in the form of a low bank and ditch.
- 5.1.3 Dipolar anomalies (A4) may indicate thermoremanent features such as kilns or furnaces. However, these anomalies are more likely to represent near surface ferrous (iron) objects.
- 5.1.4 A series of indistinct but broad linear anomalies (A5) run in an approximate east to west orientation across the site. These anomalies are indicative of former agricultural practices such as ridge and furrow. The anomalies are observed with alignments continuing across the site and are therefore likely to pre-date the aforementioned former boundary. Due to the indistinct nature of these anomalies, the features that relate to them may have been mostly removed by later ploughing.
- 5.1.5 Later ploughing is indicated by parallel anomalies aligned with the former field boundary (A6).
- 5.1.6 Further east to west oriented anomalies are noted in the north of the site (A7). These anomalies correspond to a shallow dip observed during data collection (Figure 7c). This may be a former boundary ditch or, as it has the same alignment, may be evidence of further ridge and furrow.
- 5.1.7 As regards the site specific research aims, a number of possible archaeological features were encountered across the site but the technique does not allow for specific dating of features. However, the survey has identified possible ridge and furrow and former field boundaries that may relate to medieval or post-medieval agricultural practices on the site.

Bibliography

Airphoto Services 2017. *Land at Folders Farm, Burgess Hill*. Report ref. APS 215 06 02

ASE, 2007 *An Archaeological Evaluation on Land at Folders Farm, Burgess Hill, West Sussex*. Unpublished client report. ASE Project 2948

ASE, 2017 *Land rear of 88 Folders Lane, Burgess Hill, West Sussex, RH15 0DX: Written Scheme of Investigation for Geophysical Survey and Trial Trench Evaluation*.

BGS, 2017 *Geology of Britain Viewer*

<http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html?src=topNav>

Accessed 9th October 2017

CgMs, 2015 *Land at Folders Farm Folders Lane Burgess Hill Archaeological Desk Based Assessment*

Clark, A. 1996 *Seeing Beneath the Soil*. (2nd edition). London: Routledge.

English Heritage, 2008 *Geophysical Survey in Archaeological Field Evaluation 2nd Edition* Swindon: English Heritage

Acknowledgements

Archaeology South-East would like to thank Jones Homes (Southern) Ltd for commissioning the survey.

HER Summary

HER enquiry number	N/A				
Site code	FDL17				
Project code	170701				
Planning reference					
Site address	Land at 88 Folders Lane, Burgess Hill, West Sussex				
District/Borough	Mid Sussex				
NGR (12 figures)	532798 117844				
Geology	Weald clay formation - sandstone and mudstone				
Fieldwork type					Survey
Date of fieldwork	3 rd to 5 th October 2017				
Sponsor/client	Jones Homes (Southern) Ltd				
Project manager	Neil Griffin				
Project supervisor	John Cook				
Period summary					
Project summary	<p><i>Archaeology South-East was commissioned by Jones Homes (Southern) Ltd to undertake a geophysical survey on Land at 88 Folders Lane, Burgess Hill, NGR 532798 117844. The work was undertaken between Tuesday 3rd October and Thursday 5th October 2017. Evidence for possible archaeological features was represented by moderate positive anomalies. A large linear strong positive anomaly is observed that may indicate a cut feature such as a ditch. Magnetic debris and associated probable cut features run across the site in an approximate south-west to north-east orientation. These anomalies correspond to a former boundary noted on the 1839 Ditchling tithe map. A series of indistinct but broad linear anomalies run in an approximate east to west orientation across the site. These anomalies are indicative of former agricultural practices such as ridge and furrow. The anomalies are observed with alignments continuing across the site and are therefore likely to pre-date the aforementioned former boundary. Later ploughing is indicated by parallel anomalies aligned with the former field boundary. Further east to west oriented anomalies are noted in the north of the site.</i></p>				
Museum/Accession No.	N/A				

OASIS FORM

OASIS ID: archaeol6-298052

Project details

Project name Land at 88 Folders Lane, Burgess Hill, West Sussex

Short description of the project Archaeology South-East was commissioned by Jones Homes (Southern) Ltd to undertake a geophysical survey on Land at 88 Folders Lane, Burgess Hill, NGR 532798 117844. The work was undertaken between Tuesday 3rd October and Thursday 5th October 2017. Evidence for possible archaeological features was represented by moderate positive anomalies. A large linear strong positive anomaly is observed that may indicate a cut feature such as a ditch. Magnetic debris and associated probable cut features run across the site in an approximate south-west to north-east orientation. These anomalies correspond to a former boundary noted on the 1839 Ditchling tithe map. A series of indistinct but broad linear anomalies run in an approximate east to west orientation across the site. These anomalies are indicative of former agricultural practices such as ridge and furrow. The anomalies are observed with alignments continuing across the site and are therefore likely to pre-date the aforementioned former boundary. Later ploughing is indicated by parallel anomalies aligned with the former field boundary. Further east to west oriented anomalies are noted in the north of the site.

Project dates Start: 03-10-2017 End: 05-10-2017

Previous/future work Yes / Yes

Any associated project reference codes 170737 - Contracting Unit No.

Any associated project reference codes FDL17 - Sitecode

Type of project Field evaluation

Site status None

Current Land use Grassland Heathland 3 - Disturbed

Monument type NONE None

Significant Finds NONE None

Methods & techniques "Geophysical Survey"

Development type Housing estate

Prompt Planning condition

Solid geology WEALD CLAY

Drift geology (other) None

Techniques Magnetometry

Project location

Country England

Site location WEST SUSSEX MID SUSSEX BURGESS HILL Land at 88 Folders Lane, Burgess Hill, West Sussex

Postcode RH15 0DX

Study area 7 Hectares

Site coordinates TQ 32798 17844 50.944157902968 -0.109486320333 50 56 38 N 000 06 34 W Point

Project creators

Name of Organisation Archaeology South East
Project brief originator Archaeology South East
Project design originator Mid Sussex District Council
Project director/manager Neil Griffin
Project supervisor John Cook
Type of sponsor/funding body Developer
Name of sponsor/funding body Jones Homes (Southern) Ltd

Project archives

Physical Archive Exists? No
Digital Archive recipient ASE
Digital Contents "Survey"
Digital Media available "Geophysics","Images raster / digital photography","Text"
Paper Archive recipient ASE
Paper Media available "Report"

Project bibliography 1

Publication type Grey literature (unpublished document/manuscript)

Title Detailed Magnetometer Survey on Land at 88 Folders Lane, Burgess Hill, West Sussex

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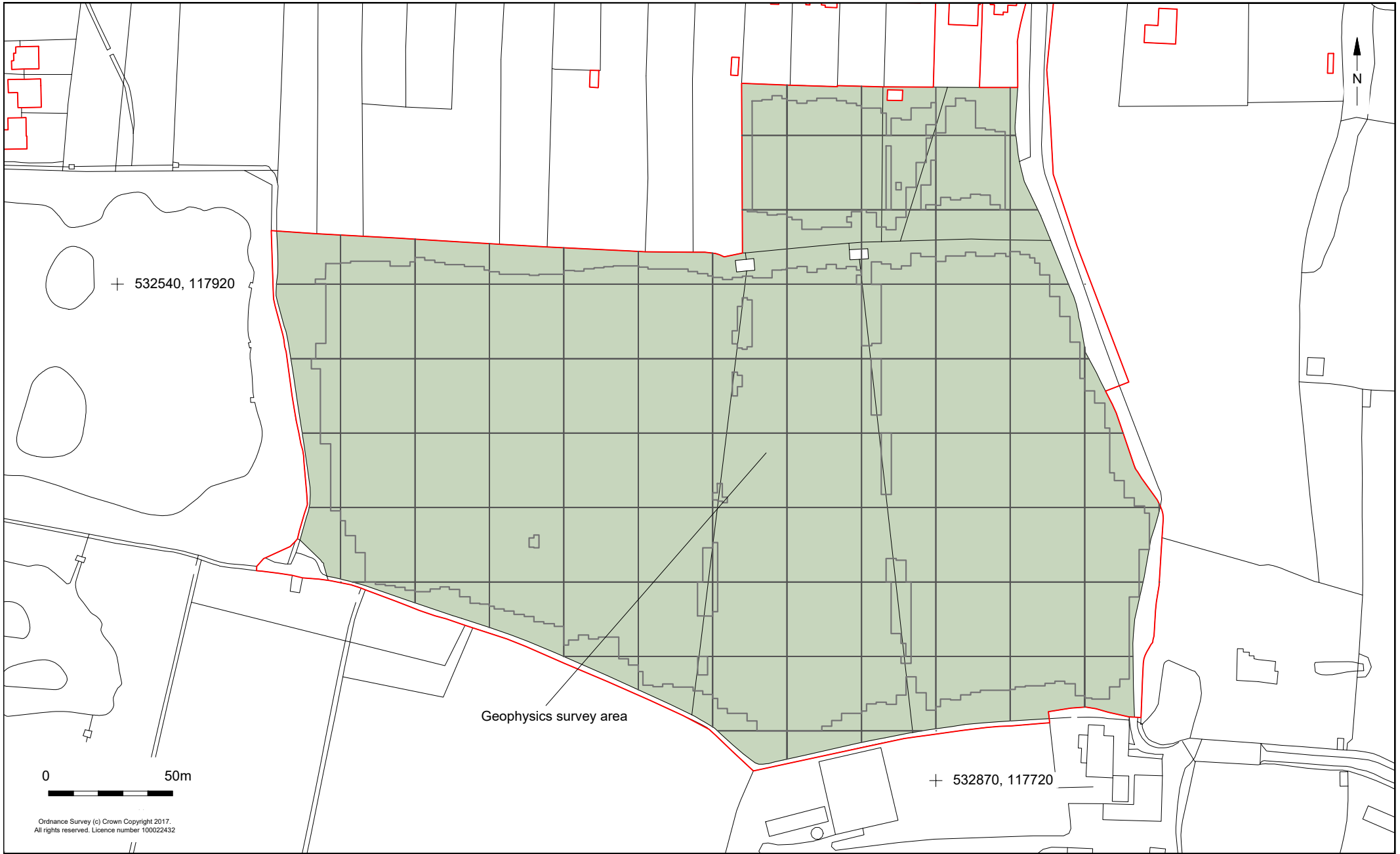
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Entered on 11 October 2017



© Archaeology South-East		88 Folders Lane, Burgess Hill	Fig. 1
Project Ref: 170737	October 2017	Site location	
Report Ref: 2017436	Drawn by: JC		



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Project Ref: 170737
Report Ref: 2017436

October 2017
Drawn by: JC

88 Folders Lane, Bugess Hill, West Sussex

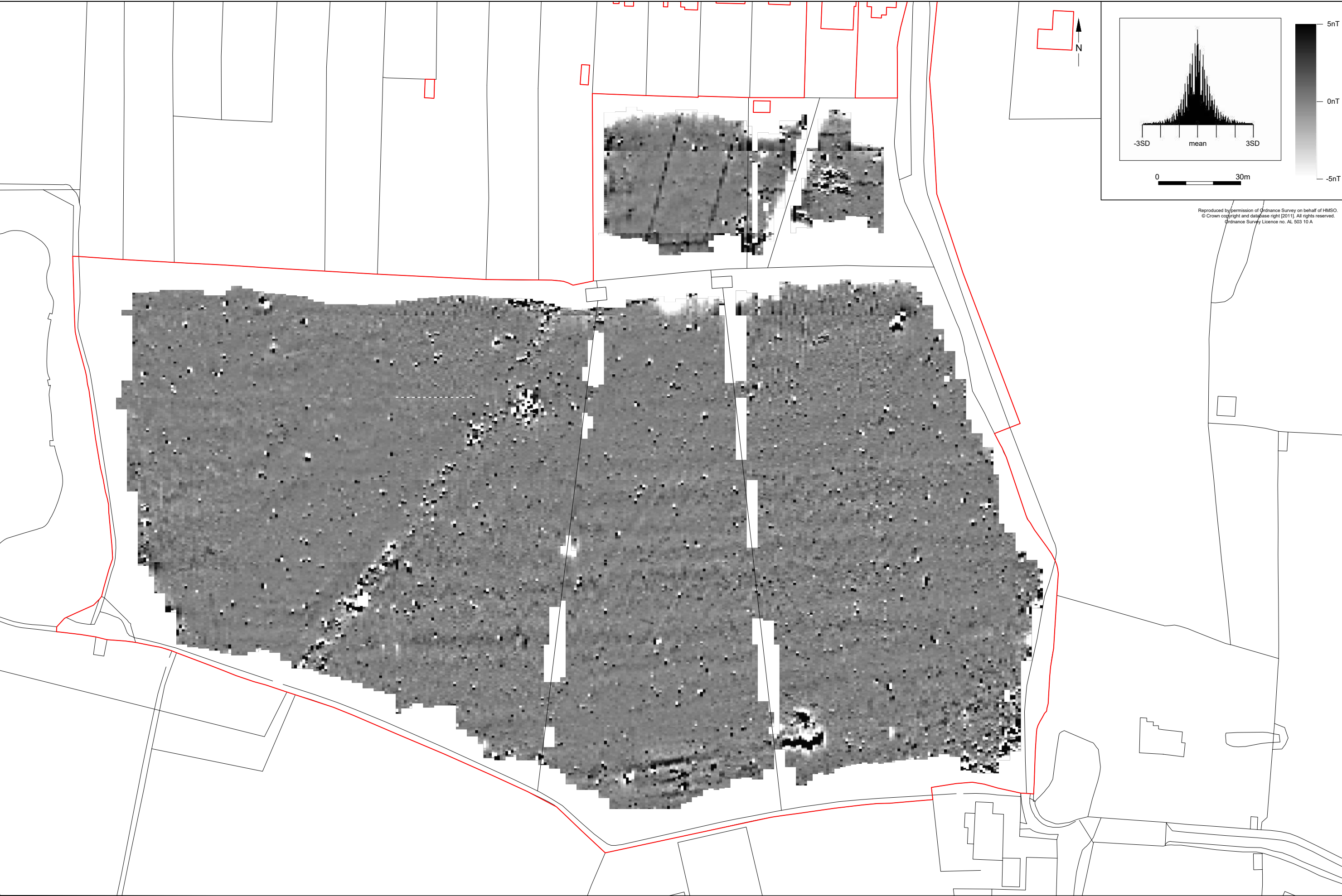
Location of geophysics survey area

Fig. 2

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Fig. 6a Oblique Google Earth imagery



Fig. 6b Oblique Google Earth 3D imagery with geophysical survey data overlay

© Archaeology South-East		88 Folders Lane, Bugess Hill, West Sussex	Fig. 6
Project Ref: 170737	October 2017	Google Earth images	
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Fig. 7a



Fig. 7b



Fig. 7c



Fig. 7d

© Archaeology South-East		88 Folders Lane, Bugess Hill, West Sussex	Fig. 7
Project Ref: 170737	October 2017	Site photographs	
Report Ref: 2017436	Drawn by: JC		

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