

**Detailed Magnetometer Survey
Land adjoining Hodges, Crowborough, East Sussex**

**NGR: 552914 131716
(TQ 52914 31716)**

**Wealden District
Planning Reference: WD/2017/2333/O**

**Site Code: SCC17
OASIS ID: archaeol6-304410
ASE Project No: 171024
ASE Report No: 2017543**



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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 ASP to undertake a geophysical survey on Land adjoining Hodges, Crowborough, East Sussex, NGR 552914 131716. The work was undertaken on Thursday 14th December 2017.

Possible archaeological features were represented by moderate positive and negative anomalies. These anomalies may represent a bank and ditch. In addition, discrete positive anomalies may indicate pits on the site. However, the formerly wooded nature of the site may mean that these anomalies relate to natural features such as tree bowls. Areas of strong magnetic debris may relate to a scattering of near surface ferrous (iron) material, demolished buildings, former field boundaries, ground disturbance, former industrial activity or made ground. Dipolar anomalies may also indicate industry in the form of possible kilns or furnaces. But, these are more likely to relate to near surface ferrous objects.

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 ASP (hereafter 'the client') to undertake archaeological investigations, initially encompassing geophysical survey, on Land adjoining Hodges, Crowborough, East Sussex, (hereafter 'the site') centred on NGR 552914 131716; Figure 1.

1.1.2 It is understood that an outline application for residential development of the site will be submitted to the Local Planning Authority (LPA) in the near future. The East Sussex County Council's (ESCC) Archaeologist (Greg Chuter) in his capacity as advisor to the LPA advisor has recommended a geophysical survey of the site to support the application.

1.1.3 A Written Scheme of Investigation (WSI) was prepared by ASE for a geophysical survey (ASE 2017).

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 Wadhurst clay formation - mudstone. No superficial geology is recorded (BGS 2017).

1.2.2 The site comprises an irregularly-shaped plot of land to the north of Eridge Road. It is bounded to the west by Fern Cottage, to the north by a large pond and east by Steel Cross Cottage (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 general aims of the geophysical survey were to identify, insofar as possible, anomalies that may be of archaeological origin.

1.4 Scope of report

1.4.1 This report details the findings of the survey. The project was conducted by John Cook with the assistance of Sophie Morrish and set out by Vasilis Tsamis. The project was managed by Vasilis Tsamis (fieldwork) and Jim Stevenson (post-excavation).

2.0 ARCHAEOLOGICAL BACKGROUND

2.1 Introduction

2.1.1 A Heritage Statement has already been prepared by the client (ASP 2017) and is summarised below and the reader is directed to the Heritage Statement for more detailed information. Additional information is derived from a recent desk-based assessment produced by ASE for an adjacent site with due acknowledgment (ASE 2012).

2.2 Prehistoric

2.2.1 No finds of Palaeolithic, Mesolithic or Neolithic material are recorded within a 1km radius of the site. However, one Early Bronze Age find was recorded (a flint barbed-and-tanged arrowhead deposited with Tunbridge Wells Museum between 1955 and 1976).

2.2.2 No Iron Age sites have been recorded within the Study Area.

2.3 Roman

2.3.1 Earthwork remains of a possible bloomery site and ironstone extraction pits located 300m north of the site. Excavation found a fragment of a Roman Glass bottle and an undated building.

2.4 Early Medieval and Medieval

2.4.1 No sites or finds of Anglo Saxon or medieval date are recorded within a 1km radius of the site.

2.5 Post-medieval

2.5.1 Three Listed Buildings of post-medieval date have been recorded within 1km of the site. Holly Tree Cottage and Pine Cottage, early 19th century; Shornbrook Cottage, 18th century or earlier and Tinkers Farmhouse, 17th century.

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 approximately 0.1ha of land as depicted on Figure 2. The work was undertaken between Thursday 14th December 2017 during cold 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 (Figures 3 and 4).

4.0 GEOPHYSICAL SURVEY RESULTS

4.1 Description of site

- 4.1.1 The survey area consisted of an irregularly-shaped plot of land to the west of Eridge Road. It is bounded to the north by pasture fields and south by Steel Cross Cottage (Figure 2).

4.2 Survey limitations

- 4.2.1 Physical obstructions encountered on site included areas of overgrown vegetation with hidden dips and tree stumps. 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 Wadhurst clay formation - mudstone. The response to magnetometer survey is 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 (Figure 5)

- 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 moderate positive and negative anomalies in the south of the site and likely to be due to a bank and ditch (positive coloured light green negative light blue). Further discrete positive anomalies may represent pits. However, these may relate to natural features.
- 4.4.3 Dipolar anomalies (pink dots) may relate to possible thermoremanent magnetic enhancement, such as kilns or furnaces, but are more likely due to near surface ferrous (iron) objects.
- 4.4.4 Strong areas of magnetic debris may relate to a scattering of near surface ferrous material, demolished buildings, former field boundaries, ground disturbance, former industrial activity or made ground (dotted brown).

5.0 CONCLUSIONS

5.1 Discussion

- 5.1.1 The strongest evidence for possible archaeological features was represented by moderate positive and negative anomalies (A1 and A2, Figure 5). These anomalies may represent a bank and ditch. In addition, discrete positive anomalies (A3) may indicate pits on the site. However, the formerly wooded nature of the site may mean that these anomalies relate to natural features such as tree boles. Areas of strong magnetic debris (A4) may relate to a scattering of near surface ferrous (iron) material, demolished buildings, former field boundaries, ground disturbance, former industrial activity or made ground. Dipolar anomalies (A5) may also indicate industry in the form of possible kilns or furnaces. But, these are more likely to relate to near surface ferrous objects.
- 5.1.3 With regards to the site-specific research aims, possible archaeological features have been identified on the site in the form of a possible bank and ditch and potential minor industrial activity or ground disturbance but the geophysical survey is unable to provide further information such as dating evidence or function.

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Accessed 29th November 2017

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Acknowledgements

Archaeology South-East would like to thank ASP for commissioning the survey.

HER Summary

HER enquiry number	N/A				
Site code	SCC17				
Project code	171024				
Planning reference	: WD/2017/2333/O				
Site address	Land adjoining Hodges, Crowborough, East Sussex				
District/Borough	East Sussex				
NGR (12 figures)	552914 131716				
Geology	Wadhurst clay formation - mudstone				
Fieldwork type				Survey	
Date of fieldwork	14th December 2017				
Sponsor/client	ASP				
Project manager	Vasilis Tsamis				
Project supervisor	John Cook				
Period summary					
Project summary	<p><i>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 ASP to undertake a geophysical survey on Land adjoining Hodges, Crowborough, East Sussex, NGR 552914 131716. The work was undertaken on Thursday 14th December 2017.</i></p> <p><i>Possible archaeological features were represented by moderate positive and negative anomalies. These anomalies may represent a bank and ditch. In addition, discrete positive anomalies may indicate pits on the site. However, the formerly wooded nature of the site may mean that these anomalies relate to natural features such as tree bowls. Areas of strong magnetic debris may relate to a scattering of near surface ferrous (iron) material, demolished buildings, former field boundaries, ground disturbance, former industrial activity or made ground. Dipolar anomalies may also indicate industry in the form of possible kilns or furnaces. But, these are more likely to relate to near surface ferrous objects.</i></p>				
Museum/Accession No.	N/A				

OASIS FORM

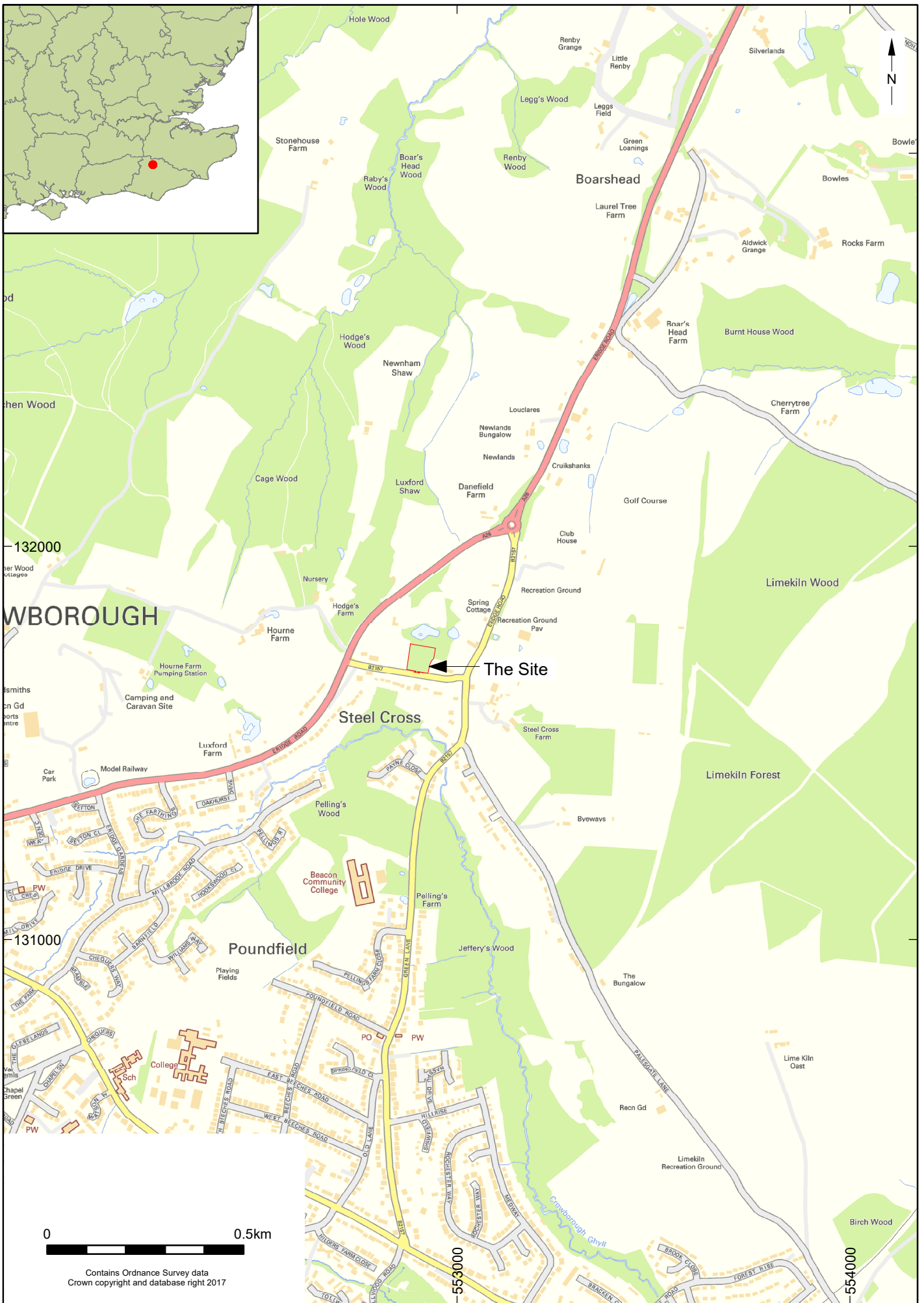
OASIS ID: archaeol6-304410

Project details

Project name	Land adjoining Hodges, Crowborough, East Sussex
Short description of the project	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 ASP to undertake a geophysical survey on Land adjoining Hodges, Crowborough, East Sussex, NGR 552914 131716. The work was undertaken on Thursday 14th December 2017. Possible archaeological features were represented by moderate positive and negative anomalies. These anomalies may represent a bank and ditch. In addition, discrete positive anomalies may indicate pits on the site. However, the formerly wooded nature of the site may mean that these anomalies relate to natural features such as tree bowls. Areas of strong magnetic debris may relate to a scattering of near surface ferrous (iron) material, demolished buildings, former field boundaries, ground disturbance, former industrial activity or made ground. Dipolar anomalies may also indicate industry in the form of possible kilns or furnaces. But, these are more likely to relate to near surface ferrous objects.
Project dates	Start: 14-12-2017 End: 14-12-2017
Previous/future work	Yes / Not known
Any associated project reference codes	171024 - Contracting Unit No.
Any associated project reference codes	SCC17 - Site code
Type of project	Field evaluation
Site status	None
Current Land use	Woodland 7 - Scrub
Monument type	NONE None
Significant Finds	NONE None

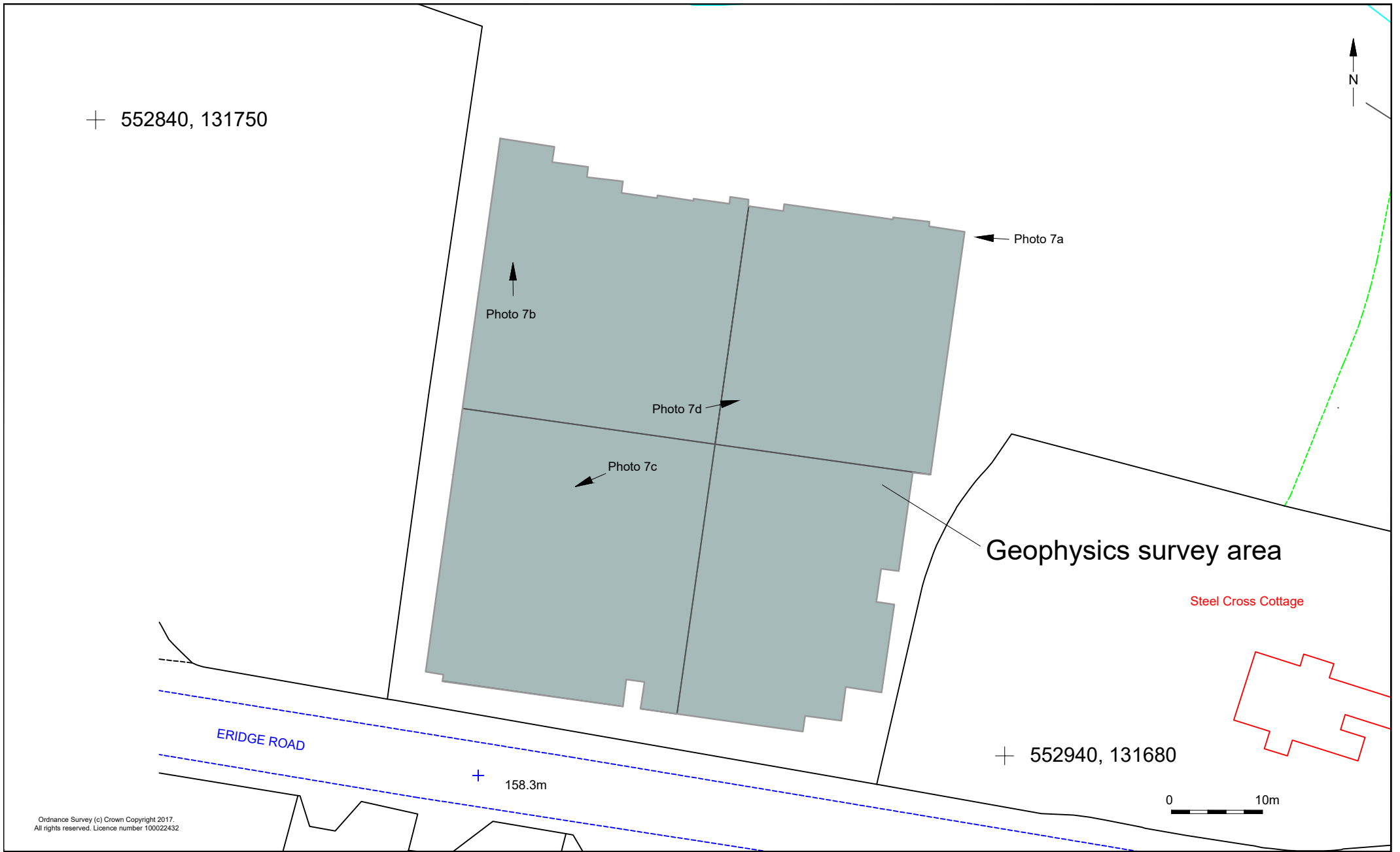
Methods & techniques	"Geophysical Survey"
Development type	Housing estate
Prompt	Planning condition
Position in the planning process	Between deposition of an application and determination
Solid geology (other)	Wadhurst Clay - mudstone
Drift geology (other)	None
Techniques	Magnetometry
Project location	
Country	England
Site location	EAST SUSSEX WEALDEN CROWBOROUGH Land adjoining Hodges, Crowborough, East Sussex
Postcode	TN6 2SS
Study area	0.3 Hectares
Site coordinates	TQ 52914 31716 51.063825538651 0.182522996708 51 03 49 N 000 10 57 E Point
Project creators	
Name of Organisation	Archaeology South-East
Project brief originator	East Sussex County Council
Project design originator	ASE
Project director/manager	Vasilis Tsamis
Project supervisor	John Cook
Type of sponsor/funding body	Developer
Name of sponsor/funding body	ASP
Project archives	
Physical Archive Exists?	No
Digital Archive recipient	ASE

Digital Media available	"Geophysics", "Images raster / digital photography"
Paper Archive recipient	ASE
Paper Media available	"Report"
Project bibliography	
1	
Publication type	Grey literature (unpublished document/manuscript)
Title	Detailed Magnetometer Survey Land adjoining Hodges, Crowborough, East Sussex
Author(s)/Editor(s)	Cook, J.
Other bibliographic details	Report number: 2017543
Date	2017
Issuer or publisher	ASE
Place of issue or publication	Portslade
Entered by	John Cook (john.cook@ucl.ac.uk)
Entered on	19 December 2017



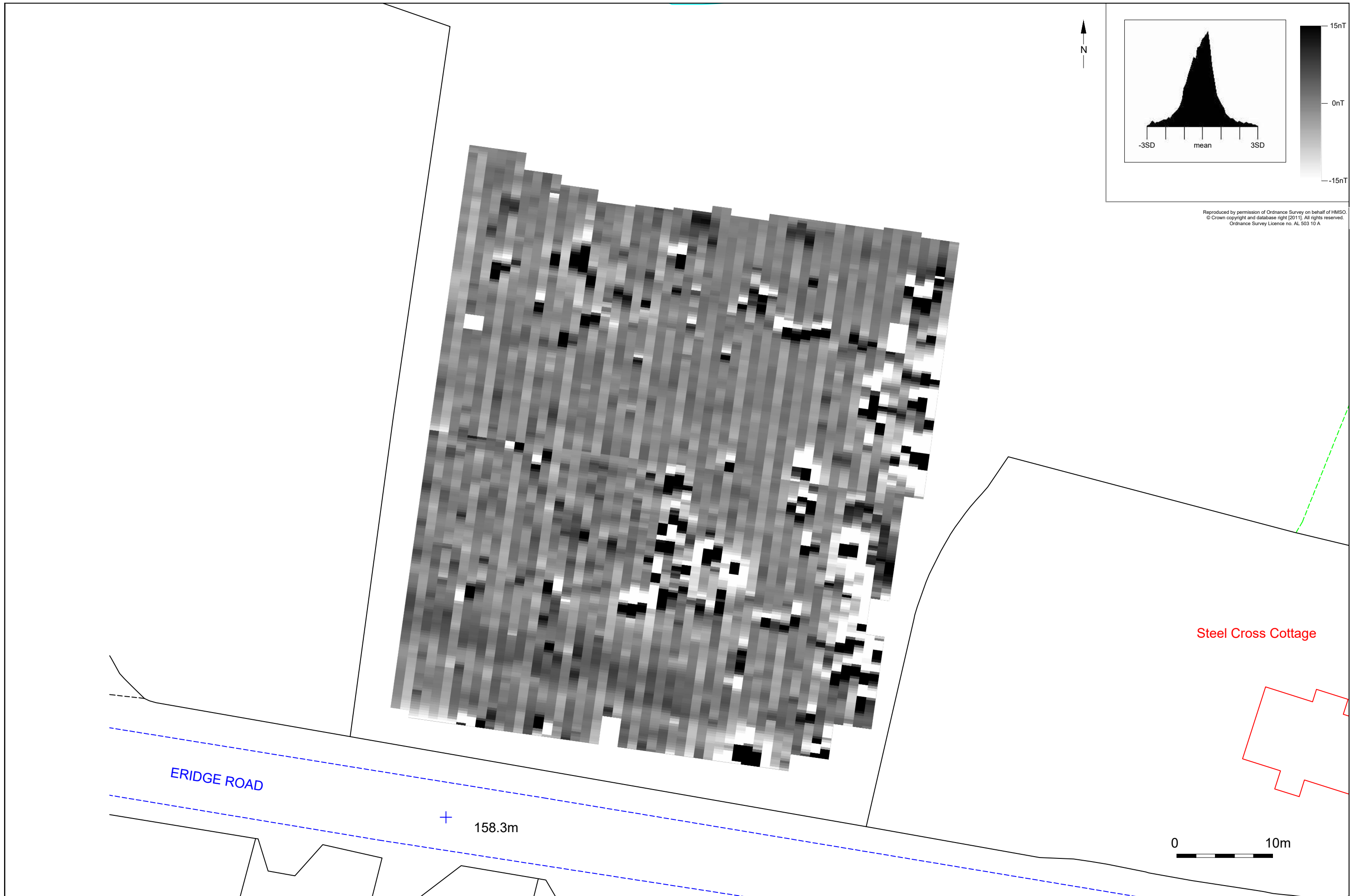
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© Archaeology South-East		Land adjoining Hodges, Crowborough, East Sussex		Fig. 1
Project Ref: 171024	December 2017	Site location		
Report Ref: 2017543	Drawn by: JC			

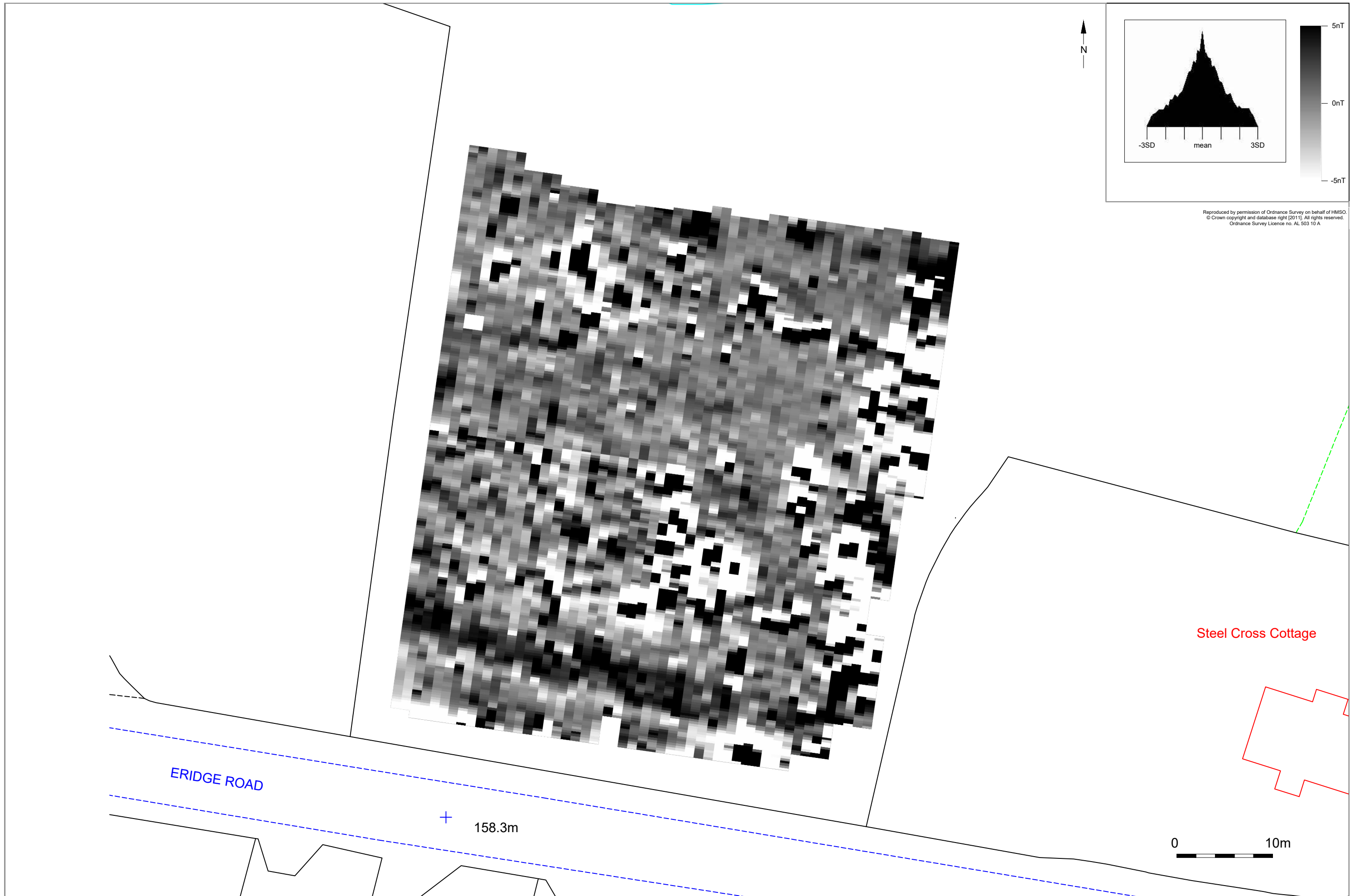


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© Archaeology South-East		Land adjoining Hodges, Crowborough, East Sussex	Fig. 3
Project Ref: 171024	December 2017	Raw data	
Report Ref: 2017543	Drawn by: JC		



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- Moderate positive anomaly (Possible archaeology)
- Moderate negative anomaly
- Magnetic debris
- Dipolar anomaly (Possible archaeology/Modern)

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Project Ref: 171024	December 2017	Interpretation		
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Fig. 6a Oblique Google Earth imagery



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

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Photo 7a



Photo 7b



Photo 7c



Photo 7d

© Archaeology South-East		Land adjoining Hodges, Crowborough, East Sussex	Fig. 7
Project Ref: 171024	December 2017	Site photographs	
Report Ref: 2017543	Drawn by: JC		

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