Archaeology South-East

ASE

Detailed Magnetometer Survey
Land at Brede Lane, Sedlescombe, East Sussex

Site Code: BRS16

NGR: 578480 118100
(TQ 78480 18100)

ASE Project No: 6648
ASE Report No: 2016338

By John Cook

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Prepared by:	John Cook	Senior Geophysicist	J. Cook
Reviewed and approved by:	Andy Margetts	Project Manager	AMargetts
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Archaeology South-East
Units 1 & 2
2 Chapel Place
Portslade
East Sussex
BN41 1DR

Tel: 01273 426830
Fax: 01273 420866
Email: fau@ucl.ac.uk
www.archaeologyse.co.uk

Abstract

Archaeology South-East was commissioned by CgMs Consulting Ltd to conduct a magnetometer survey on a site totalling approximately 4.6 hectares of land at Brede Lane, Sedlescombe, East Sussex. The work was undertaken between Monday 22nd and Wednesday 24th August 2016.

Evidence for possible archaeological features was represented by moderate positive and negative anomalies. Broad linear anomalies cross the site. They may represent evidence for enclosure or boundary ditches, however, they could equally be the result of the underlying banded geology. Anomalies in the east of the site relate to a trackway and field boundaries shown on the tithe. They are post-medieval or earlier in date. These extend northwest towards areas of magnetic debris. This likely represents near surface ferrous material, demolished buildings, ground disturbance or made ground in the area of agricultural buildings or a farmyard shown on the tithe.

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.

CONTENTS

1.0 INTRODUCTION

1.1 Site background

1.1.1 Archaeology South-East was commissioned by CgMs Consulting Ltd to conduct a magnetometer survey on a site totalling approximately 4.6 hectares of land at Brede Lane, Sedlescombe, East Sussex, henceforth referred to as 'the site' (NGR. 578480 118100; Figure 1).

1.1.2 A formal planning application for residential development will be submitted to Rother District Council (RDC) in the near future. Initial consultation with RDC's Archaeological Advisor (Casper Johnson, East Sussex County Council, hereafter 'the ESCC Archaeologist') has established that the application should be supported with a geophysical survey. This report will be submitted to the ESCC Archaeologist and RDC in order to allow informed decisions to be made as to whether or not any planning consent granted for the site should be subject to an archaeological planning condition or if there is justification to undertake intrusive investigation (e.g. trial trenching) ahead of determining planning consent.

1.2 Geology and topography

1.2.1 According to the British Geological Survey (BGS 2016a) 1:50,000 scale geological mapping the bedrock geology of the site comprises Ashdown formation - sandstone, siltstone and mudstone. No superficial deposits are recorded. No boreholes are recorded on the BGS Borehole Viewer (BGS 2016b) on or in the immediate vicinity of the site.

1.2.2 The survey area was approximately 4.6 hectares and consisted of pasture land, bounded by housing to the west, north and south, and by farmland to the south (Figures 2 and 7).

1.3 Aims of geophysical investigation

1.3.1 The general aim of the programme of geophysical survey was to obtain a better understanding of the archaeological potential of the site. This work will allow informed decisions to be made as to the need, nature and scope of any further intrusive investigations and/or mitigation measures that may be required.

1.3.2 The geophysical survey comprised a detailed magnetometer survey within all accessible areas shown on Figure 2. The survey aimed to detect any anomalies of archaeological origin that are 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

1.4 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 Chris Russel. The project was managed by Paul Mason (fieldwork) Jim Stevenson and Andy Margetts (post-fieldwork).

2.0 ARCHAEOLOGICAL BACKGROUND

2.1 The following information is paraphrased from the Desk-Based Assessment (CgMs 2013). For a more detailed historical background please refer to this document .

2.2 Despite numerous small scale archaeological interventions within a 1km radius of the study site, no clear evidence for Prehistoric activity has been identified.

2.3 Sedlescombe appears to have been a focus of the Roman iron industry. An extensive Roman iron works and bloomeries are recorded in Oaklands Park (HER Ref: MES 2572; TQ 785 175, also MES 21620; TQ 7849 1743) The numerous small scale archaeological interventions carried out in Sedlescombe in recent years have revealed no clear evidence for local intensive settlement and activity in this period.

2.4 A very large Anglo Saxon coin hoard is recorded from Sedlescombe in 1876 (HER Ref: MES 2411; TQ 7803 1806). Around two to three thousand coins were recovered and these are thought to have been part of the bullion reserve of the Hastings Mint hidden at the time of the Norman invasion.

2.5 Gardner and Gream's map of 1795, the 1806 Ordnance Survey and the Greenwood map of 1825 all show the study site in agricultural land.

3.0 SURVEY METHODOLOGY

3.1 Geophysical survey

3.1.1 A fluxgate gradiometer (magnetometry) survey was undertaken across two parcels of land, as depicted on Figure 2 (NGR 578480 118100). The work was undertaken between Monday 22nd and Wednesday 24th August 2016 during dry, clear and hot weather.

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; 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 was approximately 4.6 hectares and consisted of pasture land, bounded by housing to the west, north and south, and by farmland to the south.

4.2 Survey limitations

4.2.1 Physical obstructions encountered on site included nettles, hidden dips and wire fences (Figure 2). 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 mudstone geology. An average response to magnetometer is possible, although results may 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.

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

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

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

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

4.3.6 *Dipolar Anomalies*
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.

4.3.7 *Bipolar Anomalies*
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.

4.3.8 *Thermoremanence*
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 3-7)

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 are 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 positive anomalies, noted as A1, A2, A4 and A5, and likely to be due to cut features such as a ditches. These are associated with negative anomalies (A3) that may relate to archaeological features such as banks and earthworks. However, negative anomalies may also stem from the dipolar effect of certain magnetic anomalies.

4.4.3 A number of discrete moderate positive (A6) anomalies may indicate cut features such as pits. However, these anomalies may also relate to in filled natural features.

4.4.4 Negative linear magnetic anomalies (A7) are observed that may relate to drainage features and correspond to a number of positive linear anomalies and may indicate alternating forms of drainage feature.

4.4.5 Magnetic debris (A8) may relate to a scattering of near surface ferrous material, demolished buildings, former field boundaries, ground disturbance or made ground.

4.4.6 Closely spaced linear anomalies run down the slope (A9) and are probably the result of ploughing.

5.0 CONCLUSIONS

5.1 Discussion

5.1.1 Evidence for possible archaeological features was represented by moderate positive and negative anomalies (A1 to A6). A broad linear anomaly (A1) crosses the site following the contours of the slope and overlooking the valley to the south. This anomaly (along with weak positive and negative anomalies A2 and A3), may represent evidence for enclosure or boundary ditches and a bank. These anomalies are, however, mirrored by local bands of mudstone within the local underlying geology (BGS 2016a). Though they could have an archaeological origin, they may equally be the result of the natural geology. None of these features appear on the 1841 tithe map, where the land parcel is largely shown as being cultivated for arable, nor do they appear on later Ordnance Survey or other historic mapping.

5.1.2 Anomalies A4 (in the east of the site) relate to a trackway and field boundaries shown on the tithe (1841; Figure 6). They are post-medieval or earlier in date. These extend northwest towards areas of magnetic debris (A8). This likely represents near surface ferrous material, demolished buildings, ground disturbance or made ground in the area of agricultural buildings or a farmyard shown on the tithe (1841; Figure 6).

5.1.3 Anomaly A5 relates to a field boundary shown on the tithe (1841; Figure 6). It is post-medieval or earlier in date. The fact that it is orientated collinear with other field boundaries in the surrounding landscape (Figure 7) and on historic mapping indicates that it may mark the line of a former routeway, track or hollow way.

5.1.4 Possible cut features such as pits are indicated across the site (A6). However, these may relate to infilled natural features or to previous agricultural activity.

5.1.5 A negative linear anomaly (A7) corresponds to a boundary on the 1977 OS map (Figure 6) but not on the 1961 OS map. A series of parallel positive and negative linear magnetic anomalies are observed on the same alignment that may relate to drainage features from this period.

5.1.6 Former ploughing (A9) is noted running down the slope.

5.1.7 In conclusion a number of possible archaeological features were encountered across the site including, former routeways, field boundaries, possible building remains and potential cut features such as pits. Whilst some could be identified on historic mapping, anomalies A1, A2 and A3 possibly relate to a bank and ditch(s) following the contours of the slope or are the result of the natural underlying geology. They predate any historic cartography in the area.

Bibliography

BGS 2016a. *Geology of Britain Viewer*
http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html?src=topNav
Accessed 31st August 2016

BGS 2016b. British Geological Survey, *Borehole Scans*
http://www.bgs.ac.uk/data/boreholescans/home.html
Accessed 31st August 2016

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

CgMs 2013. *Land at Brede Lane Sedlescombe East Sussex* Desk Based Assessment. CgMs unpublished report

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

Acknowledgements

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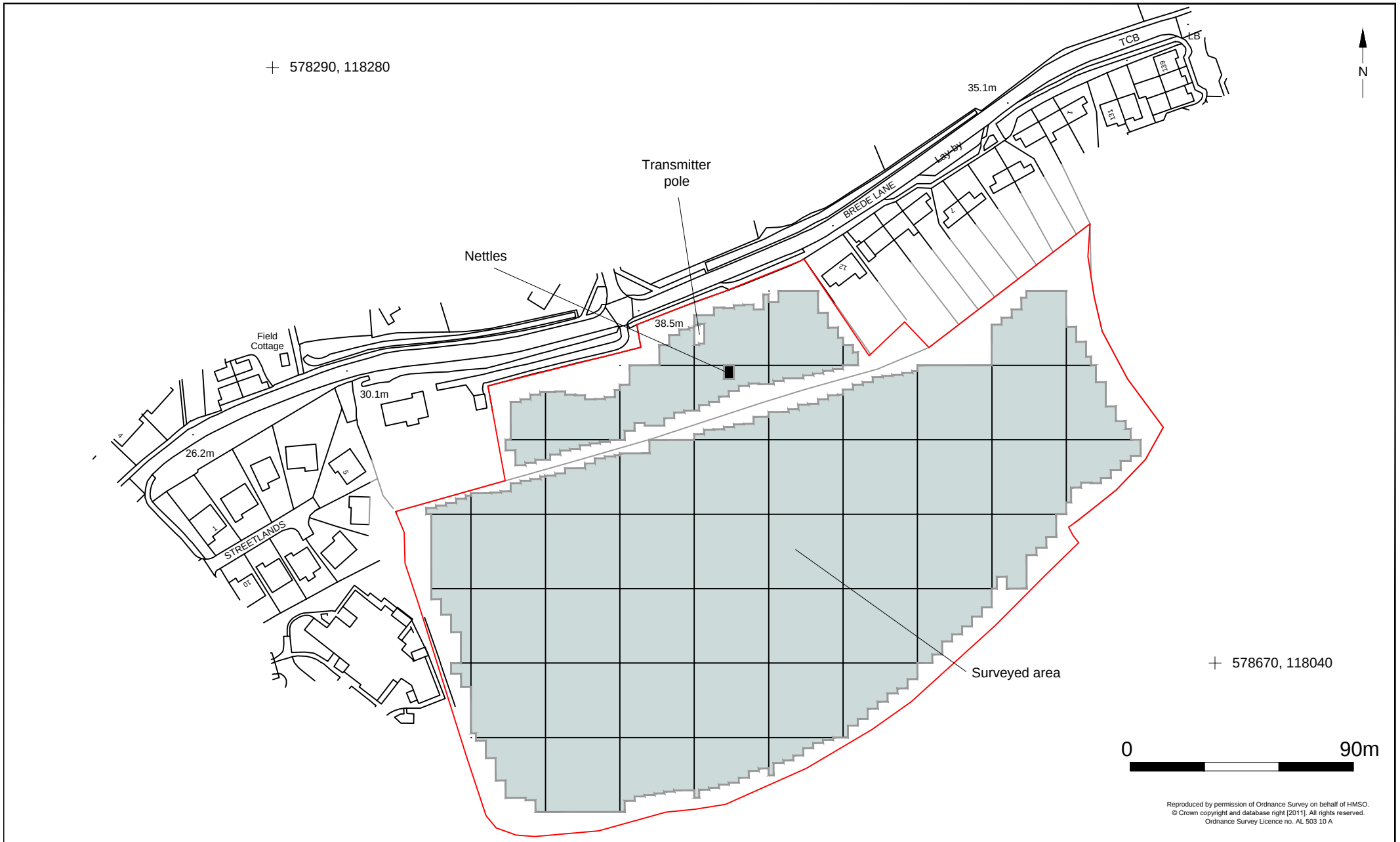
HER Summary

HER enquiry number	N/A					
Site code	BRS16					
Project code	6648					
Planning reference						
Site address	Land at Brede Lane, Sedlescombe, East Sussex					
District/Borough	East Sussex					
NGR (12 figures)	578480 118100					
Geology	Ashdown formation - sandstone, siltstone and mudstone					
Fieldwork type					**Survey**	
Date of fieldwork	22nd – 24th August 2016					
Sponsor/client	CgMs Consulting Ltd					
Project manager	Paul Mason					
Project supervisor	John Cook					
Period summary						
Project summary	*Archaeology South-East was commissioned by CgMs Consulting Ltd to conduct a magnetometer survey on a site totalling approximately 4.6 hectares of land at Brede Lane, Sedlescombe, East Sussex. The work was undertaken between Monday 22nd and Wednesday 24th August 2016. Broad linear anomalies cross the site. These may represent evidence for enclosure or boundary ditches or may equally be the result of the underlying banded geology. Anomalies in the remainder of the site relate to trackways, field boundaries and agricultural buildings shown on the tithe (1841). They are post-medieval or earlier in date.*					
Museum/Accession No.	N/A					

© Archaeology South-East		Brede Lane, Seddlescombe, East Sussex	Fig. 1
Project Ref: 6648	August 2016	Site location	
Report Ref: 2016338	Drawn by: JC		



© **Archaeology South-East**		Brede Lane, Seddlescombe, East Sussex	Fig. 2
Project Ref: 6648	August 2016	Site plan	
Report Ref: 2016338	Drawn by: JC		

© **Archaeology South-East**		Brede Lane, Sedlescombe, East Sussex	Fig. 3
Project Ref: 6648	August 2016	Raw data	
Report Ref: 2016338	Drawn by: JC		

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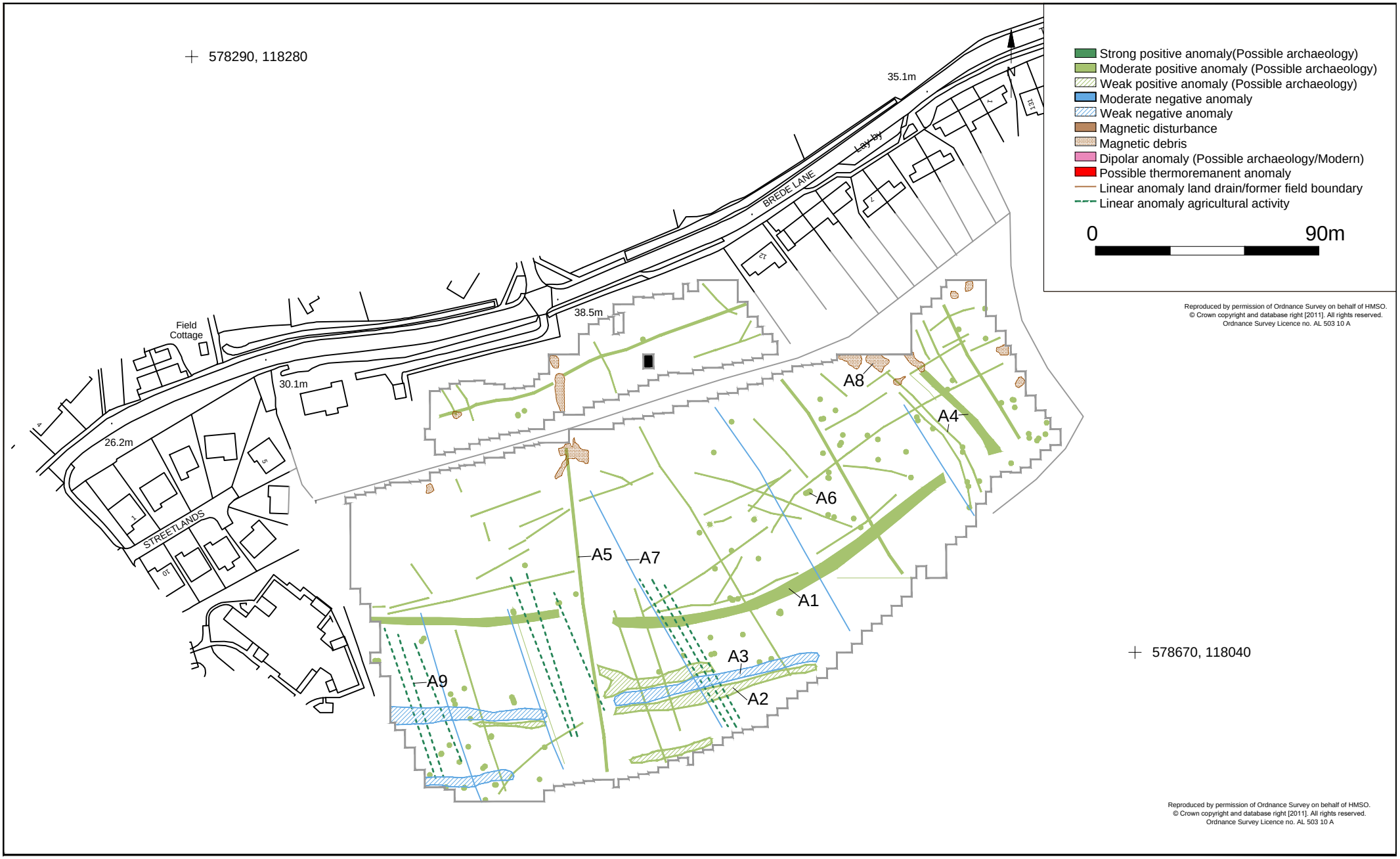
Project Ref: 6648	August 2016	Processed data	
Report Ref: 2016338	Drawn by: JC		



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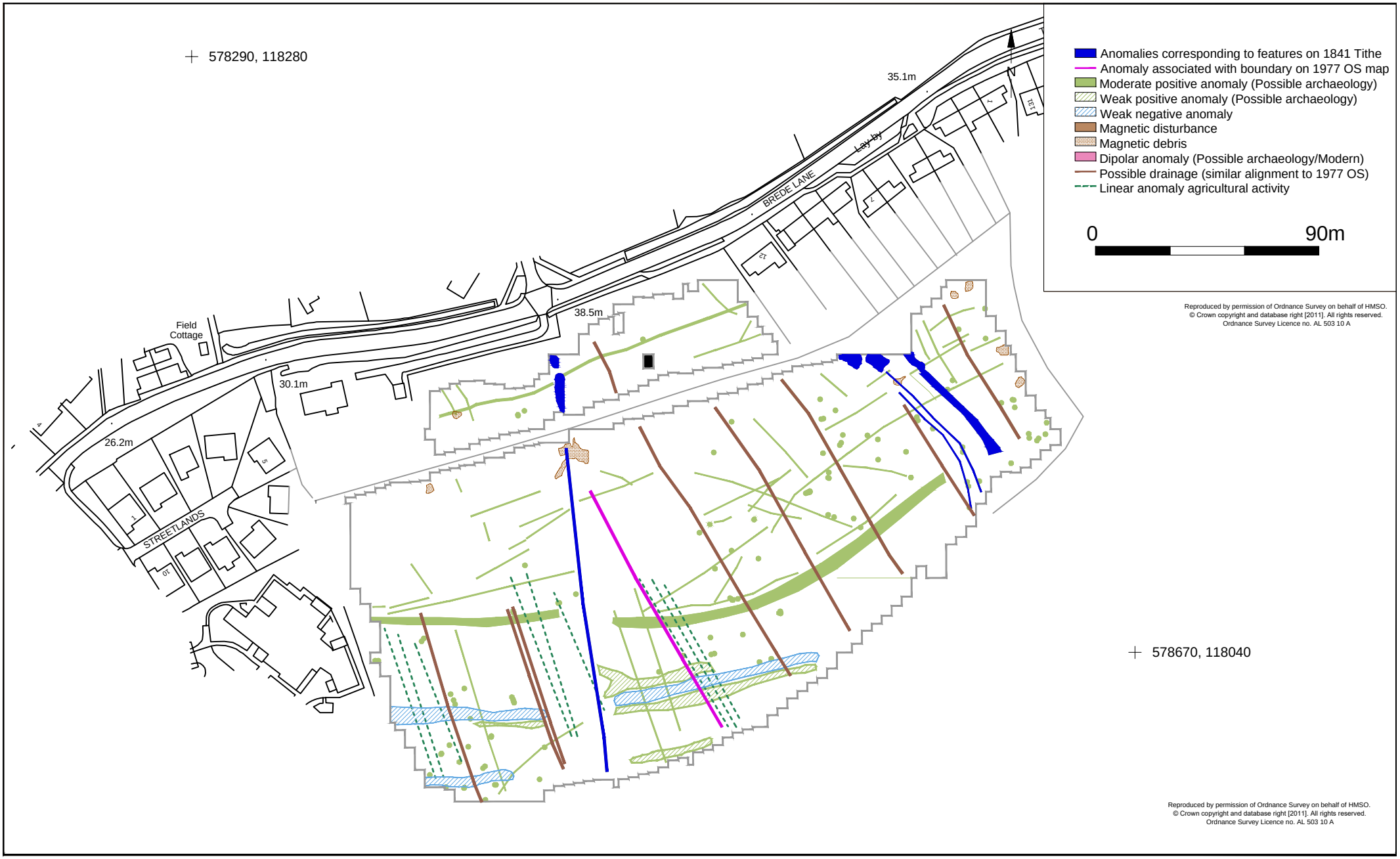
© Archaeology South-East		Brede Lane, Sedlescombe, East Sussex	Fig. 5
Project Ref: 6648	August 2016	Interpretation	
Report Ref: 2016338	Drawn by: JC		



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© Archaeology South-East		Brede Lane, Seddlescombe, East Sussex	Fig. 6
Project Ref: 6648	August 2016	Interpretation with features noted on historical mapping	
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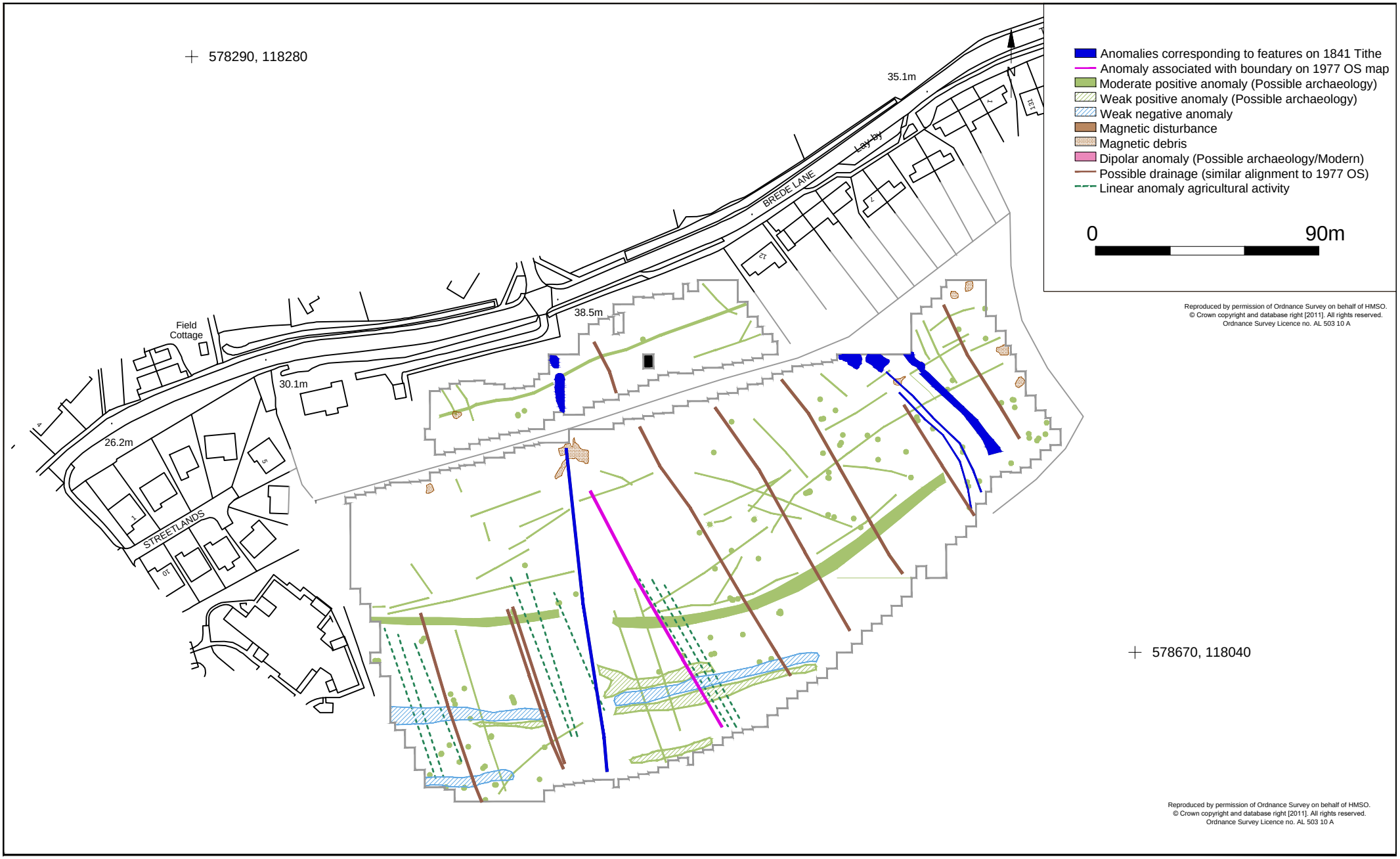

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© Archaeology South-East		Brede Lane, Seddlescombe, East Sussex	Fig. 6
Project Ref: 6648	August 2016	Interpretation with features noted on historical mapping	
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Fig. 7a Oblique Google Earth imagery

Fig. 7b Oblique Google Earth 3D imagery with geophysical survey data overlain

© **Archaeology South-East**		Brede Lane, Seddlescombe, East Sussex	Fig. 7
Project Ref: 6648	August 2016	Google Earth images	
Report Ref: 2016338	Drawn by: JC		

Sussex Office
Units 1 & 2
2 Chapel Place
Portslade
East Sussex BN41 1DR
tel: +44(0)1273 426830
email: fau@ucl.ac.uk
www.archaeologyse.co.uk

Essex Office
27 Eastways
Witham
Essex
CM8 3YQ
tel: +44(0)1376 331470
email: fau@ucl.ac.uk
www.archaeologyse.co.uk

London Office
Centre for Applied Archaeology
UCL Institute of Archaeology
31-34 Gordon Square
London WC1H 0PY
tel: +44(0)20 7679 4778
email: fau@ucl.ac.uk
www.ucl.ac.uk/caa