



Land at Main Road, Sellindge, Kent

Detailed Gradioemeter Survey Report

Planning Ref: Y16/1122/SH
Ref: 252440.03
February 2022



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Summary

A detailed gradiometer survey was conducted over land at Land at Main Road, Sellindge, Kent (centred on NGR 610900 137900). The project was commissioned by Quinn Estates Ltd with the aim of establishing the presence, or otherwise, and nature of detectable archaeological features in support of a planning application for the development of the site as residential dwellings, office space, and industrial units, with associated access roads and landscaping. A public recreation ground, nature reserve, greenway, and bridle path will also form part of the development.

The site comprises arable fields covering an area of 19 ha. The geophysical survey was undertaken between 31 January 2022 and 4 February 2022. The geophysical survey has demonstrated the presence of anomalies of potential archaeological interest across the site.

The geophysical survey has not identified any anomalies that can confidently be interpreted as archaeology. However, several anomalies are considered possible archaeology. Some of these may relate to partially ditched enclosures part of a wider field system or area of settlement, possibly associated with Iron Age or Romano-British activity noted in the surrounding area. However, due to the weak nature of the anomalies and the extensive modern agricultural activity across the site, these anomalies may be by-products of such activity.

In addition to these linear anomalies, there is a weak curvilinear anomaly in the east of the site that may relate to a Bronze Age round barrow or a Late Iron Age to Romano-British roundhouse. Given that there is evidence for activity dating to both these periods within the vicinity of the site, it is not clear what period this anomaly relates to.

The former field boundaries that have been identified by this survey are corroborated by mapping dating to 1899. However, some of the weak trends that share a similar alignment to these may relate to further field boundaries that are not directly evident on available historical mapping.

An area of strong increased magnetic response has been identified on the southern boundary of the site. This may be associated with the construction of the embankment for the M20 to the south. However, due to the number of services identified in the area, this increased magnetic response may be another service.

Acknowledgements

Wessex Archaeology would like to thank Quinn Estates Ltd for commissioning the geophysical survey. The assistance of Alex Kalorkoti is gratefully acknowledged in this regard.

The fieldwork was undertaken by Pamela Warne and Jake Bishop. Brett Howard processed and interpreted the geophysical data, produced illustrations, and wrote the report. The geophysical survey was quality controlled by Nicholas Crabb and the project was managed, on behalf of Wessex Archaeology, by Tom Richardson.



Land at Main Road, Sellindge, Kent

Detailed Gradiometer Survey Report

1 INTRODUCTION

1.1 Project background

1.1.1 Wessex Archaeology was commissioned by Quinn Estates Ltd to carry out a geophysical survey at Main Road, Sellindge, Kent, TN25 6ET (centred on NGR 610900 137900) (**Figure 1**). The survey forms part of an ongoing programme of archaeological works being undertaken in support of a planning application for the development of the site as residential dwellings, office space, and industrial units, with associated access roads and landscaping. A public recreation ground, nature reserve, greenway, and bridle path will also form part of the development.

1.2 Scope of document

1.2.1 This report presents a brief description of the methodology followed by the detailed survey results and the archaeological interpretation of the geophysical data.

1.3 The site

1.3.1 The geophysical survey area is located immediately to the east of the village of Sellindge to the north of the M20, in the county of Kent. It is equidistant between the town of Ashford, 8 km to the north-west, and Folkestone, 8 km to the east.

1.3.2 The survey comprises 19 ha of agricultural land, currently utilised for crop. The site is bounded by residential development to the west and north-west, further agricultural land to the east and north-east, and the M20 to the south.

1.3.3 The site is on a south-east facing incline sloping from 75 m above Ordnance Datum (aOD) at the northern edge to 62 aOD at the southern edge.

1.3.4 The solid geology predominantly comprises Mudstone, Siltstone and Sandstone of the Sandgate Formation. However, there is a narrow band of Sandstone of the Folkestone Formation in the northern (upslope) part of the site. In the central and southern portion of the site this is overlain by superficial Head deposits clay and silt. Alluvial deposits are recorded adjacent to the Brook to the south-east of the site (BGS 2022).

1.3.5 The soils underlying the site are likely to consist of argillic gley soils of the 841e (Parkgate) association (SSEW SE Sheet 6 1983). Soils derived from such geological parent material have been shown to produce magnetic contrasts acceptable for the detection of archaeological remains through magnetometer survey.

2 ARCHAEOLOGICAL BACKGROUND

2.1 Introduction

2.1.1 The archaeological and historical background was assessed in a prior desk-based assessment (DBA) (SWAT Archaeology 2016), which considered the recorded historic environment resource within a 500 m radius study area of the proposed development. This



used information from the Kent Historic Environment Record (HER) and the National Heritage List for England (NHLE). The findings of the DBA are summarised below, and any additional sources of information are referenced, as appropriate.

2.2 Archaeological and historical context

- 2.2.1 There are no scheduled monuments located within the study area but there are a small number located slightly beyond this. This includes Horton Priory to the north of the site (NHLE 1018878), Westenhanger Castle to the west (NHLE 1020761), and a number of Bronze Age funerary monuments forming a barrow cemetery to the south of the village of Barrow Hill (NHLE 1475132; 1475133).
- 2.2.2 Within and surrounding the village of Sellindge, there are 11 listed buildings. These predominantly comprise Grade II listed domestic and agricultural properties of post-medieval date, the nearest of which is Rhodes House (NHLE 1344203), directly west of the site.
- 2.2.3 There are few records pertaining to early prehistoric periods within the study area. A possible palaeochannel has been identified 200 m to the south of the site, during an evaluation of land at Cedars. This has some broad geoarchaeological potential for the recovery of palaeoenvironmental material should this comprise any well-preserved peat deposits. However, given that the site is located beyond the alluvial floodplain of the East Stour River, it is not likely that this extends into the site. However, deposits mapped as Head can contain and/or bury stable land surfaces, archaeological features, and palaeoenvironmental remains.
- 2.2.4 As mentioned previously, a barrow cemetery, dating from around the Early Bronze Age is located to the south of the site, surrounding the village of Barrow Hill. This comprises the buried and earthwork remains of seven barrows (NHLE: 1475132), the closest of which was identified in Mount field, 300 m south of the site. As the site is located in a similar position overlooking the East Stour River, it is possible that the site may fall within this funerary landscape.
- 2.2.5 There is some evidence for Iron Age activity within Sellindge, with the findspots of several coins identified through metal detecting, including one coin of the Cantii tribe, and three gold coins, 200 m west of the site. Similarly, although the site lies three miles north of the village of Lympne, a known Roman settlement, there has been only one recorded find from this period in the area. This find is a copper alloy bead uncovered 200 m south-west of the site.
- 2.2.6 Numerous geophysical surveys and archaeological evaluations have taken place 300 m south-west of the site at Otterpool (Wessex Archaeology 2020, 2021a-b; Headland Archaeology 2018a-b; Sumo 2018a-c; Magnitude 2018; Oxford Archaeology 2018a-b). These identified an area of Romano-British settlement centred around an villa, as well as some Bronze Age or earlier ditches.
- 2.2.7 There are no records dating to the early medieval period, but the name *Sellindge* may be Anglo-Saxon in origin and first appears in the Domesday Book.
- 2.2.8 Multiple finds have been uncovered within the 500 m search radius of the site including during an evaluation 200 m west of the site. In addition, Talbot House, a medieval hall house, was 100 m to the south of the site before relocation and Lees cottages, 300 m north-west of the site (NHLE: 1367112) also dates to this period.



2.2.9 The London to Dover Railway runs 300 m to the south-east of the site and two crash sites, one of a Supermarine Spitfire I and Supermarine Spitfire II, are within 500 m of a nodal point 100 m to the north-west of the site.

3 METHODOLOGY

3.1 Introduction

3.1.1 The geophysical survey was undertaken by Wessex Archaeology's in-house geophysics team between 31 January – 4 February 2022. Field conditions at the time of the survey were adequate for survey. An overall coverage of 15.3 ha was achieved, due to obstruction caused by field boundaries, and scrub land toward the south-west.

3.1.2 The methods and standards employed throughout the geophysical survey conform to that set out in the Written Scheme of Investigation (WSI) (Wessex archaeology 2018), as well as to current best practice, and guidance outlined by the Chartered Institute for Archaeologists' (CIfA 2014) and European Archaeologiae Consilium (Schmidt *et al.* 2015).

3.2 Aims and objectives

3.2.1 The aims of the survey comprise the following:

- To determine, as far as is reasonably possible, the nature of the detectable archaeological resource within a specified area using appropriate methods and practices; and
- To inform either the scope and nature of any further archaeological work that may be required; or the formation of a mitigation strategy (to offset the impact of the development on the archaeological resource); or a management strategy.

3.2.2 In order to achieve the above aims, the objectives of the geophysical survey are:

- To conduct a geophysical survey covering as much of the specified area as possible, allowing for on-site obstructions;
- To clarify the presence/absence of anomalies of archaeological potential; and
- Where possible, to determine the general nature of any anomalies of archaeological potential.

3.3 Fieldwork methodology

3.3.1 The cart-based gradiometer system used a Leica Captivate RTK GNSS instrument, which receives corrections from a network of reference stations operated by the Ordnance Survey (OS) and Leica Geosystems. Such instruments allow positions to be determined with a precision of 0.02 m in real-time and therefore exceeds European Archaeologiae Consilium recommendations (Schmidt *et al.* 2015).

3.3.2 The detailed gradiometer survey was conducted using SenSys FGM650/3 gradiometers mounted at 1 m intervals on either a non-magnetic cart or on a hand-held frame with an effective sensitivity of 0.03 nT.

3.3.3 Data was collected at 0.25 m intervals or better along transects spaced 1 m apart, in accordance with European Archaeologiae Consilium recommendations (Schmidt *et al.* 2015). Data was collected in the zigzag method.



3.4 Data processing

- 3.4.1 Data from the survey were subjected to minimal correction processes. These comprise a 'Destripe' function (± 5 nT thresholds), applied to correct for any variation between the sensors, and an interpolation used to grid the data and discard overlaps where transects have been collected too close together.
- 3.4.2 Further details of the geophysical and survey equipment, methods and processing are described in **Appendix 1**.

4 GEOPHYSICAL SURVEY RESULTS AND INTERPRETATION

4.1 Introduction

- 4.1.1 The geophysical survey has identified magnetic anomalies across the site. Results are presented as a series of greyscale plots and archaeological interpretations at a scale of 1:2000 (**Figures 2 and 3**). The data are displayed at -2 nT (white) to +3 nT (black) for the greyscale image.
- 4.1.2 The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous responses, burnt or fired objects, and magnetic trends (**Figure 3**). Full definitions of the interpretation terms used in this report are provided in **Appendix 2**.
- 4.1.3 Numerous ferrous anomalies are visible throughout the dataset. These are presumed to be modern in provenance and are not referred to, unless considered relevant to the archaeological interpretation.
- 4.1.4 It should be noted that small, weakly magnetised features may produce responses that are below the detection threshold of magnetometers. It may therefore be the case that more archaeological features may be present than have been identified through geophysical survey.
- 4.1.5 Gradiometer survey may not detect all services present on site. This report and accompanying illustrations should not be used as the sole source for service locations and appropriate equipment (e.g. CAT and Genny) should be used to confirm the location of buried services before any trenches are opened on site.

4.2 Gradiometer survey results and interpretation

- 4.2.1 In the western part of the site, directly north of Springfield Cottage, there is a rectilinear arrangement of positive anomalies at **4000**. This comprises north-east to south-west orientated linear anomalies, together with a more amorphous strong anomaly, collectively covering a 28 m by 8 m area. The linear anomalies indicate ditches that may be associated with an enclosure. The amorphous anomaly is most likely a pit feature, possibly comprising multiple pits. Given the strength of the anomaly, this may relate to burnt or fired material. It is possible that these anomalies relate to an area of settlement activity, possibly associated with the Bronze Age and Iron Age/Romano-British activity noted in the surrounding area. However, the full extent of the features likely lie outside of the survey area, making confident interpretation difficult.
- 4.2.2 In the east of the site, there is a weakly positive penannular anomaly at **4001**, which is open on the south-eastern side. It is 11 m in diameter and comprises a 2 m wide ditch-like feature. This may be associated with a Bronze Age round barrow, but the slightly segmented appearance may suggest that it is comprised of a series of pit-like features, potentially relating to a Late Iron Age to Romano-British roundhouse. However, the anomaly is very weak and further investigation would be required to confirm its precise origin.



- 4.2.3 In the centre of the site, two positive curvi-linear trends are similar in form to **4001**. However, these are extremely weak and are more likely associated with natural variations in the subsurface.
- 4.2.4 Extending north-eastwards from **4001** is a weakly positive linear anomaly at **4002**. This is 47 m long by 2 m wide and is most likely related to a ditch feature. Given the proximity to **4001**, it may be associated, but it is equally likely that it relates to later agricultural activity.
- 4.2.5 In the centre of the site, there is a weak positive linear anomaly at **4003**, which is 69 m in length. It is on a broadly north – south orientation, intersecting perpendicularly at its southern extremity with a 21 m long linear anomaly on an east – west orientation. These anomalies are both 2 m in width and indicate ditch-like features. It is possible that they relate to part of a former field system. It is not possible to provide a date from the geophysical data alone and this may be relatively modern in origin.
- 4.2.6 Approximately 25 m west of **4003**, is a further weakly positive rectilinear anomaly at **4004**. It is 'L-shaped', measuring 12 m long on its north-east to south-west axis before turning 90 degrees to the north-west and continuing for 22 m. It is 2 m wide indicating a further ditch-like feature, which may be associated with the remains of a partial enclosure. However, its relatively isolated nature makes confident interpretation difficult, and it may relate to modern agricultural activity.
- 4.2.7 In the most southerly portion of the site there is a strong positive linear anomaly at **4005**. This is 22 m long by 2 m wide on a broadly north – south orientation. This indicates a ditch, however there is a lot of increased magnetic response in the area, prohibiting any further contextual information. However, given the lower-lying and roadside position, it may relate to modern drainage.
- 4.2.8 There is a strong dipolar linear anomaly evident in the west of the site at **4006**. This is 80 m long on a north – south orientation. This anomaly has been interpreted as a service, however further trends are also recorded continuing to the north (**4007**), suggesting that this may follow the line of a former field boundary. It appears to extend from an existing boundary situated to the north, and satellite imagery of the site also appear to show cropmarks that could relate to a former field boundary, albeit not evident on available historical maps.
- 4.2.9 There are a small number of additional linear anomalies identified across the site that are associated with former field boundaries. These are comprised of weakly positive responses, together with some stronger dipolar anomalies that likely relate to ferrous material. The longest of these is located in the northern portion of the site at **4008**. This is orientated on a broadly east – west orientation, turning slightly towards the north in the eastern extent. In the south of the site, there is a north – south aligned example at **4009**, and a further weak positive anomaly in the easternmost field at **4010**. Each of these have been identified on 1889 OS mapping.
- 4.2.10 In the southern part of the site, numerous strong dipolar linear anomalies are associated with modern services (**4011 – 4014**). Many of these run toward the M20, south of the site, and are likely associated with pipes or cables.
- 4.2.11 An area of strong increased magnetic response has been identified along the southern boundary of the site at **4015**. This is likely related to groundworks associated with the construction of the embankment of the M20 to the south of the site. However, it could also relate to further modern services in the area. In addition, the circular area at **4016** corresponds with the presence of a pylon for an overhead powerline.



5 DISCUSSION

- 5.1.1 The geophysical survey has not identified any anomalies that can confidently be interpreted as archaeology. However, several anomalies are considered possible archaeology. These are predominantly associated with linear ditch features and former field boundaries. Some of these may relate to partially ditched enclosures part of a wider field system or area of settlement possibly associated with Iron Age or Romano-British activity noted in the surrounding area. However, due to the weak nature of the anomalies and the extensive modern agricultural activity across the site, these anomalies may be by-products of such activity.
- 5.1.2 In addition to these linear anomalies, there is a weak curvilinear anomaly in the east of the site that may relate to a Bronze Age round barrow, but the slightly segmented appearance, may suggest that it is comprised of a series of pit-like features, potentially relating to a Late Iron Age to Romano-British roundhouse. Given that there is evidence for activity dating to both these periods within the vicinity of the site, it is not clear what period this anomaly relates to.
- 5.1.3 The former field boundaries that have been identified by this survey are corroborated by mapping dating to 1899. However, some of the weak trends that share a similar alignment to these may relate to further field boundaries that are not directly evident on available historical mapping.
- 5.1.4 An area of strong increased magnetic response has been identified on the southern boundary of the site. This may be associated with the construction of the embankment for the M20 to the south. However, due to the number of services identified in the area, this increased magnetic response may be another service.



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Wessex Archaeology, 2022. *Written Scheme of Investigation for Archaeological Geophysical Survey; Land at Main Road, Sellindge, Kent*. Project ref: 252440.02

Cartographic and documentary sources

Ordnance Survey 1983 *Soil Survey of England and Wales Sheet 6, Soils of Midland and Western England*. Southampton.

Online resources

British Geological Survey Geology of Britain Viewer (accessed February 2022)
<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

Historic England (HE) website <http://historicengland.org.uk>, (accessed February 2022)

Old Maps (accessed February 2022) <https://www.old-maps.co.uk>



APPENDICES

Appendix 1: Survey Equipment and Data Processing

Survey methods and equipment

The magnetic data for this project were acquired using a non-magnetic cart fitted with four SenSys FGM650/3 magnetic gradiometers. The instrument has four sensor assemblies fixed horizontally 1 m apart allowing four traverses to be recorded simultaneously. Each sensor contains two fluxgate magnetometers arranged vertically with a 1m separation and measures the difference between the vertical components of the total magnetic field within each sensor array. This arrangement of magnetometers suppresses any diurnal or low frequency effects.

The gradiometers have an effective resolution of 0.03 nT over a ± 100 nT range, and measurements from each sensor are logged at intervals of 0.25 m. The data are transmitted to, and recorded by, MonMX software. The program also receives measurements from a GPS system, which is fixed to the cart at a measured distance from the sensors, providing real time locational data for each data point.

The cart-based system relies upon accurate GPS location data which is collected using a Leica Captivate system with rover and base station. This receives corrections from a network of reference stations operated by the Ordnance Survey and Leica Geosystems, allowing positions to be determined with a precision of 0.02m in real-time and therefore exceed the level of accuracy recommended by European Archaeologiae Consilium recommendations (Schmidt *et al.* 2015) for geophysical surveys.

Data may be collected with a higher sample density where complex archaeological anomalies are encountered, to aid the detection and characterisation of small and ephemeral features. Data may be collected at up to 0.125 m intervals along traverses spaced up to 0.25m apart.

Post-processing

The magnetic data collected during the detail survey are downloaded from the SenSys cart system for processing and analysis using both commercial and in-house software. This software allows for both the data and the images to be processed in order to enhance the results for analysis; however, it should be noted that minimal data processing is conducted so as not to distort the anomalies.

The cart-based system generally requires a lesser amount of post-processing than the handheld Bartington Grad 601-2 fluxgate gradiometer instrument. This is largely because mounting the gradiometers on the cart reduces the occurrence of operator error; caused by inconsistent walking speeds and deviation in traverse position due to varying ground cover and topography.

Typical data and image processing steps may include:

- GPS DeStripe – Determines the median of each transect and then subtracts that value from each datapoint in the transect. May be used to remove the striping effect seen within a survey caused by directional effects, drift, etc.
- GPS Base Interpolation – Sets the X & Y interval of the interpolated data and the track radius (area around each datapoint that is included in the interpolated result).



- Discard Overlaps - Intended to eliminate a track(s) that have been collected too close to one another. Without this, the results of the interpolation process can be distorted as it tries to accommodate very close points with potentially differing values.

Typical displays of the data used during processing and analysis:

- XY Plot – Presents the data as a trace or graph line for each traverse. Each traverse is displaced down the image to produce a stacked profile effect. This type of image is useful as it shows the full range of individual anomalies. XY plots can be made available upon request.
- Greyscale – Presents the data in plan view using a greyscale to indicate the relative strength of the signal at each measurement point. These plots can be produced in colour to highlight certain features but generally greyscale plots are used during analysis of the data.



Appendix 2: Geophysical Interpretation

The interpretation methodology used by Wessex Archaeology separates the anomalies into four main categories: archaeological, modern, agricultural, and uncertain origin/geological.

The archaeological category is used for features when the form, nature and pattern of the anomaly are indicative of archaeological material. Further sources of information such as aerial photographs may also have been incorporated in providing the final interpretation. This category is further sub-divided into three groups, implying a decreasing level of confidence:

- Archaeology – used when there is a clear geophysical response and anthropogenic pattern.
- Possible archaeology – used for features which give a response, but which form no discernible pattern or trend.

The modern category is used for anomalies that are presumed to be relatively modern in date:

- Ferrous – used for responses caused by ferrous material. These anomalies are likely to be of modern origin.
- Modern service – used for responses considered relating to cables and pipes; most are composed of ferrous/ceramic material although services made from non-magnetic material can sometimes be observed.

The agricultural category is used for the following:

- Former field boundaries – used for ditch sections that correspond to the position of boundaries marked on earlier mapping.
- Ridge and furrow – used for broad and diffuse linear anomalies that are considered to indicate areas of former ridge and furrow.
- Ploughing – used for well-defined narrow linear responses, usually aligned parallel to existing field boundaries.
- Drainage – used to define the course of ceramic field drains that are visible in the data as a series of repeating bipolar (black and white) responses.

The uncertain origin/geological category is used for features when the form, nature and pattern of the anomaly are not sufficient to warrant a classification as an archaeological feature. This category is further sub-divided into:

- Increased magnetic response – used for areas dominated by indistinct anomalies which may have some archaeological potential.
- Trend – used for low amplitude or indistinct linear anomalies.
- Superficial geology – used for diffuse edged spreads considered to relate to shallow geological deposits. They can be distinguished as areas of positive, negative, or broad bipolar (positive and negative) anomalies.



Appendix 3: OASIS form

Project Details:

Project name	Land at Main Road, Sellindge, Kent				
Type of project	Detailed gradiometer survey (Field evaluation)				
Project description	<p>The anomalies of archaeological potential indicate the possibility of partial ditched enclosures. However, due to the weak nature of the anomalies and the extensive agricultural activity across the site, it is possible that these anomalies are by-products of this agricultural activity, or further archaeological evidence has been destroyed by said activity.</p> <p>Several former field boundaries have been identified in the data and have been corroborated by historic mapping. However, there is some evidence to suggest that other, potentially older, field boundaries may have been identified in the data which are not directly evident on historic mapping.</p> <p>An area of strong increased magnetic response was identified on the southern boundary of the site. This may be associated with the construction of the embankment for the M20 to the south. However, due to the number of services identified in the area, it is possible this increased magnetic response may be another service.</p> <p>Several linear and curvilinear trends are evident in the data across the site. These anomalies are too weak and indistinct to confidently interpret but may indicate further anthropogenic activity on the site.</p>				
Project dates	Start: 31 January 2022		End: 4 February 2022		
Previous work	DBA – SWAT Archaeology				
Future work	Not known				
Project Code:	252440	HER event no.	N/A	OASIS form ID:	wessexar1-504819
		NMR no.	N/A		
		SM no.	N/A		
Planning Application Ref.	Y16/1122/SH				
Site Status	None				
Land use	Agricultural - Arable				
Monument type	N/A	Period	N/A		

Project Location:

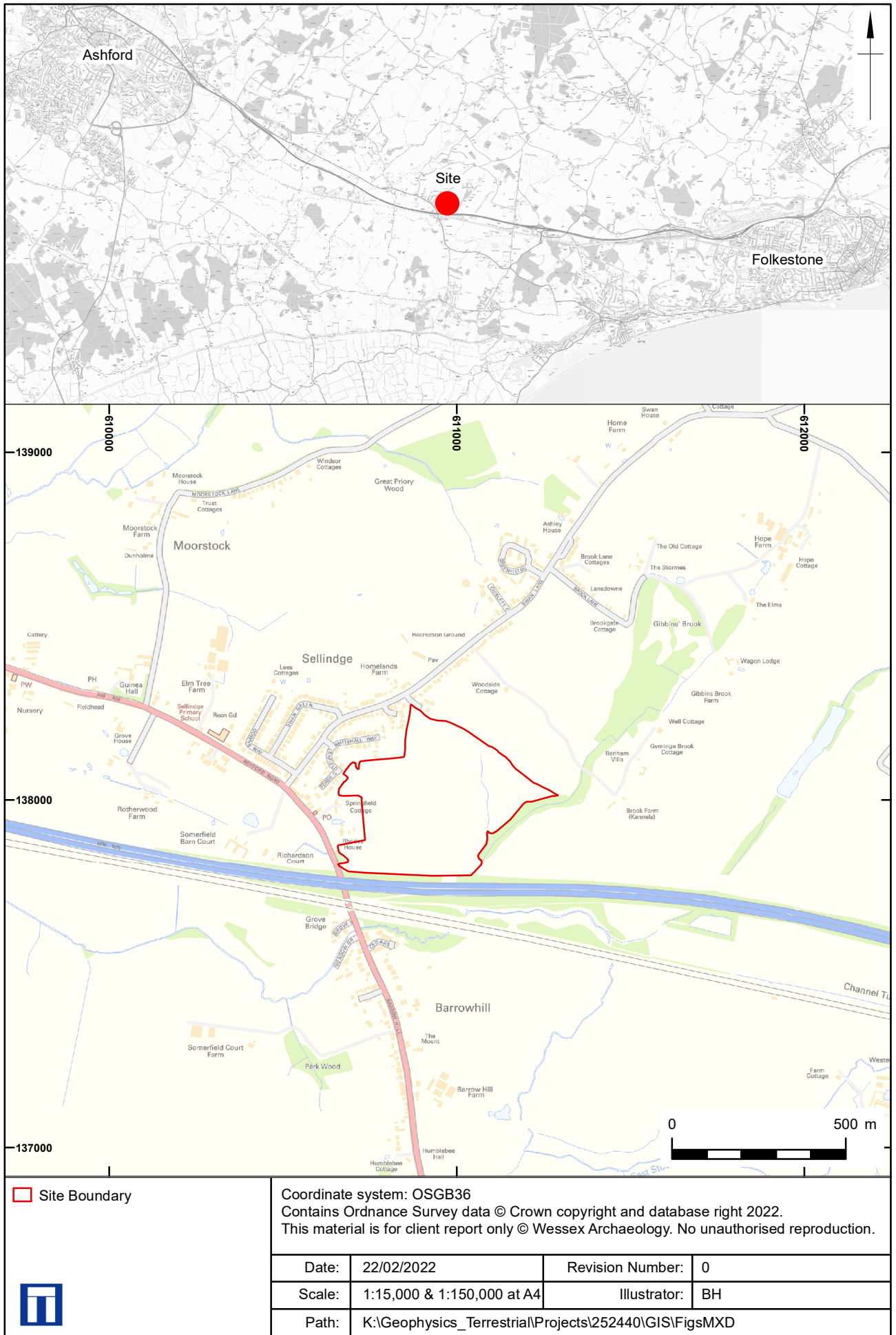
Site Address	Main Road, Sellindge, Kent,			Postcode	TN25 6ET
County	Kent	District	Folkestone and Hythe	Parish	Sellindge
Study Area	19 ha	Height OD	75 - 62 m aOD	NGR	610900 137900

Project Creators:

Name of Organisation	Wessex Archaeology			
Project brief originator	Quinn Estates Ltd	Project design originator	Client	
Project Manager	Tom Richardson	Project Supervisor	Pamela Warne	
Sponsor or funding body	Quinn Estates Ltd	Type of Sponsor	Client	

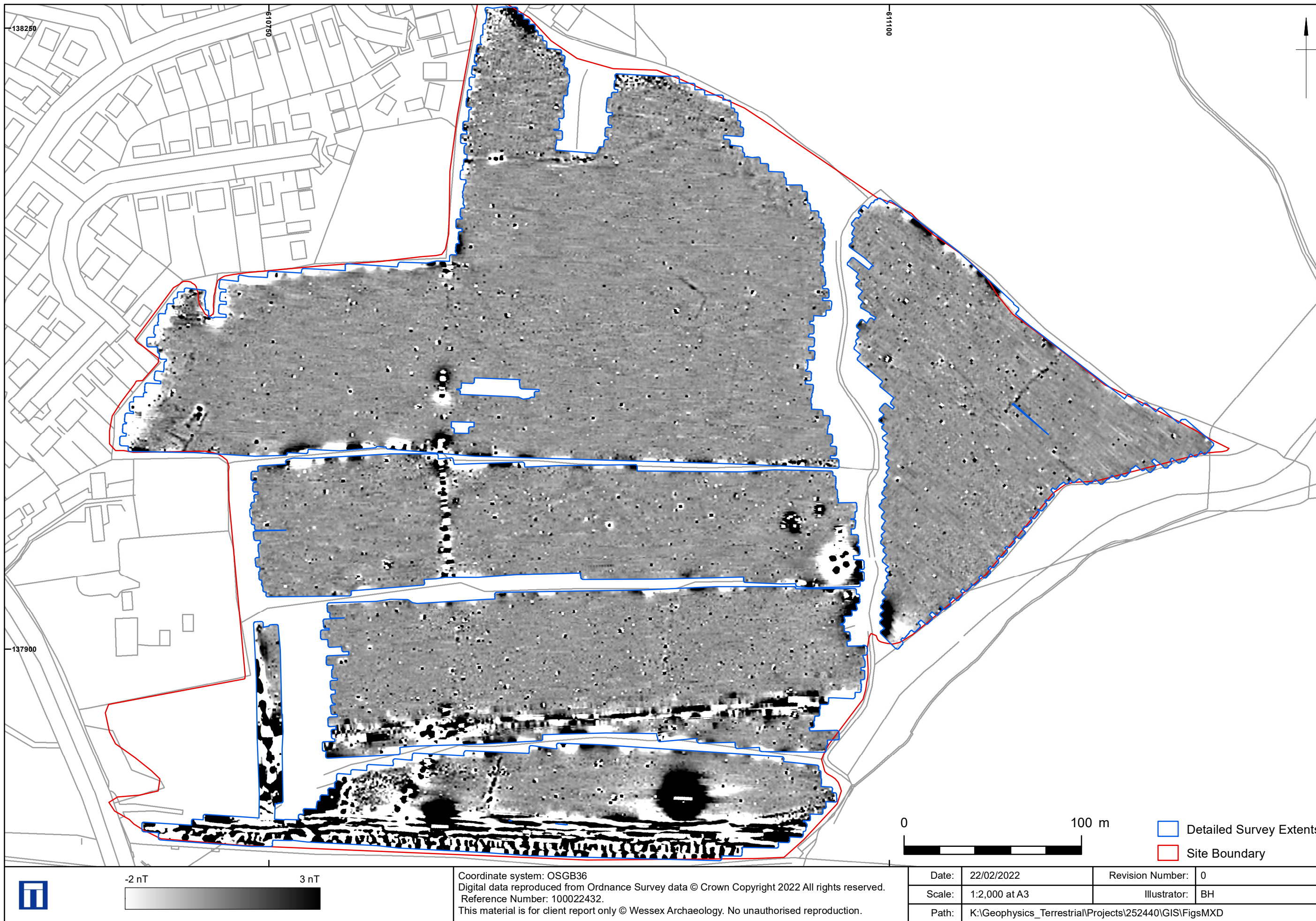
Project Archive and Bibliography:

Physical archive	N/A	Digital Archive	Geophysical survey and report	Paper Archive	N/A
Report title	Land at Main Road, Sellindge, Kent			Date	2022
Author	Wessex Archaeology	Description	Unpublished report	Report ref.	252440.03



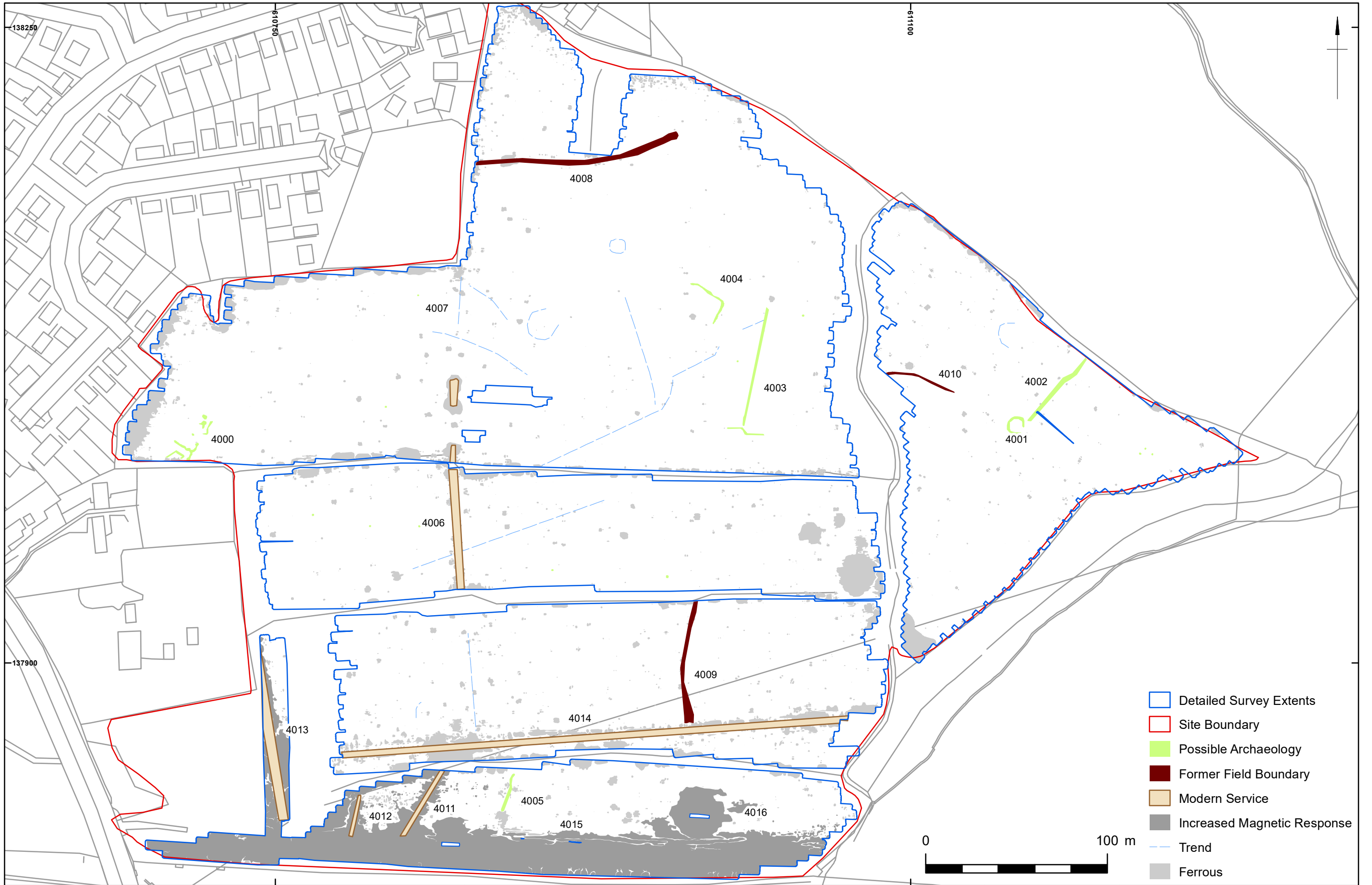
Site location and survey extent

Figure 1



Detailed gradiometer survey results: greyscale plot

Figure 2



Coordinate system: OSGB36
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Detailed gradiometer survey results: interpretation

Figure 3



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