AB HERITAGE
ARCHAEOLOGICAL CONSULTANCY

Land North of The Rosary, Partridge Green

Geophysics and Walkover Survey Report

Client: THE MANSER PRACTICE

AB Heritage Project No:10463

Date:30/01/2015

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Geophysics and Walkover Survey Report

Client	**The Manser Practice**
Project Number	**10463**
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CONTENTS

1. INTRODUCTION

1.1 Site Location & Description

1.1.1 The proposed development site (hereafter referred to as The Site) is located on the north-eastern edge of the modern village of partridge Green, and approximately c.175mto the north of The Rosary at centre point NGRTQ 18704 194568.

1.1.2 The Site survey area is split into two fields [North and South], which are demarcated by a wooden fence running east-west across the site, just to the north following the line of the fence there is a line of mature trees. To the north, east and west sides the field boundaries are marked by a line of trees, with hedge row growing in-between. The western boundary is reinforced by the presence of a raised bank supporting a public footpath. The south boundary is a wooden fence set infront of a line of trees. The entrance to the site is located in the southwest of the site, nearby a private entrance linking a house to the field. All fields are currently all under pasture and relatively flat and were able to be surveyed.

1.2 Geology & Topography

1.2.1 The proposed development site lies at a low level c.10mAboveOrdnance Datum (AOD).

1.2.2 The overlying soils have been classified as alluvium (British Geological Survey: Geology of Britain Viewer), that is sedimentary clays, silt, sand and gravel. Alluvial deposits do have the potential to mask archaeological features.

1.2.3 The underlying geology is made up of the Weald Clay Formation which is a sandstone/mudstone formed 125 – 135 million years ago. The Weald Clay Formation indicates that the previous environment was dominated by swamps, estuaries and river deltas. It is unlikely the underlying geology will have an effect on the quality of the data.

2. GEOPHYSICSAIMS & METHODOLOGY

2.1 Aims of Works

2.1.1 Geophysical survey is a programme of non-intrusive archaeological work. The aims of this geophysical survey were to:

- Identify any geophysical anomalies of possible archaeological origin within the specified survey area;
- Accurately locate these anomalies and present the findings in map form; and
- Provide recommendations for any further archaeological work(s) necessary to contribute to the mitigation of the impacts of proposed development on these potential features.

2.1.2 The results of the geophysical survey are provided in this report,along with an interpretation of findings.

2.2 Methodology of Works Summary

Site Specific Information

2.2.1 A magnetometry survey was undertaken across the site of proposed development from, Monday the 19th of January to Wednesday the 21st of January 2015, covering an area of c.5ha hectares.

2.2.2 The AB Heritage staff members who undertook the works were Glenn Rose (Senior Project Archaeologist),Kerry Kerr-Peterson (Assistant Project Archaeologist), and James Dunn (Archaeological Technician). The weather conditions for the work were mainly dry and sunny throughout the survey, with occasional short light showers; this would have had no material impact on the survey.

2.2.3 All data capture downloaded periodically on site for a data quality check.

Equipment

2.2.4 The magnetic survey equipment used was one Bartington Grad-601-2 (dual fluxgate magnetometer).Please see Appendix A which contains a detailed methodology for the works undertaken; however briefly, Table 1, below, shows site specific information on how the magnetometer was set up:

Table 1: Setting Parameters of Magnetometer

Grid Size	30x30 metres
Data Capture Distances	0.5 x 0.25
Sensors	2
Sensitivity	0.1nT

2.2.5 AGPS was used to setup and reference the survey site using a Trimble GeoXR which has a sub-centimetre accuracy suitable for this survey.

2.3 Known Constraints

2.3.1 The site is bounded by trees and dense shrubbery with some metallic fencing within the vegetation; these are likely to create an area of magnetic disturbance 1-2m from the boundary.

2.3.2 At the southern end of the south field there was a large metal framed trampoline, which obstructed some transects and may have caused an area of magnetic disturbance c-2-3m. In addition, in the eastern end of the site there was an area of overgrown vegetation which obstructed transects.

PLATE 1: View of the southern edge of the south field looking west

2.3.3 Running east-west across the centre of the site was a wooden fence with metal wire. At the western edge of this of boundary there was a make shift electric fence that was not active during the survey. This may have caused an area of magnetic disturbance c.1-2m from the fence in this area.

PLATE 2: View of the electronic fence

3. GEOPHYSICSRESULTS & INTERPRETATIONS

3.1 Results

3.1.1 All results have been sub-classified into two plots (North and South) and defined by AB numbers which are mapped within the interpretation plot Figure 4.

3.1.2 One bi-polar linear feature [**AB 1**] runs through the entire site from the south western corner to the north east corner, stretching to a distance of c. 280m with associated magnetic disturbance [**AB 3**]

Plot 1 (Northern Field)

3.1.3 A Bi-polar linear feature [**AB1**] runs north west to south east along the eastern boundary in the north eastern side of the site, with a length of c.50m. Di-Polar anomalies [**AB 4]** in a amorphous pattern are situated within Plot 1,with a higher density situated within the western side of the site.

Plot 2 (Southern Field)

3.1.4 A series of c. 5m equidistantly spaced low positive linear features [**AB2**]run in an east to west direction.

3.1.5 A Bi-polar anomaly runs along the southern boundary in an east to west direction c. 100m in length , with associated magnetic disturbance [**AB 3**]. Di-polar [**AB 4**] anomalies are randomly distributed over the field, but are noticeably more dense in the eastern side of plot 2.

3.2 Interpretation

3.2.1 Interpretation of the results of geophysical survey is based on professional judgement as to the likely/probable cause of an anomaly or reading. For example, strong dipolar discrete anomalies of small size are often associated with ferrous debris or similarly magnetic debris. In addition, where a positive linear anomaly is recorded, which has a negative anomaly associated alongside either side of it, is often likely to relate to the line of a modern service.

Table 1: Interpretation of Geophysical Anomalies

AB No	Appearance	Potential Cause
AB 1	Alternating positive Negative Linear (Bi-polar)	Modern Utilities
AB 2	Equidistant Positive Linear	Agricultural activity
AB3	Magnetic Disturbance	Ferrous/magnetic objects or disturbed geology
AB 4	Di-polar (Positive with associated negative)	Magnetic debris

4. WALKOVER SURVEY

4.1.1 A site walk over was carried out on the 20th of January 2015 coinciding with the geophysical survey. This comprised an inspection of the site and identification of any features present, which were recorded via GPS location and then photographed. A map of identified features can be seen on Figure 4, and for the purposes of this walkover the site is split into Plot1 (Southern Field) and Plot 2 (Northern Field).

4.2 Plot 1 (Southern Field)

4.2.1 Plot 1 was under short grass pasture at the time of the site walk over. The boundaries consist of a former railway embankment along the western side with a concrete post and wire fence, a wooden stake and wire fence along the northern and southern sides and a wooden fence adjacent to a mature tree line along the eastern side. A small wooded area is present in the western corner of the field.

4.2.2 A small brick stack (**AB 6, Photo 1**) is located in the southwest corner of the field. This comprises 6 courses of mortar bonded bricks. The stack appears to have originally been higher and has been reduced in height. It has a square central shaft running down the interior of the stack. The depth of the shaft is unknown.

Photo 1: Remains of brick stack (AB 6), viewed from the northeast

4.2.3 The remains of a small, square low lying earthwork (**AB 7, Photo 2**) is located in the southwest corner of Plot 1. The structure is approximately 3m by 3m and appears to have an entrance in the eastern and western corners. It is constructed from a mixture of angular flint blocks, bricks and concrete. The function of this structure is unclear, it may have an agricultural purpose or it could be related to the former adjacent railway line.

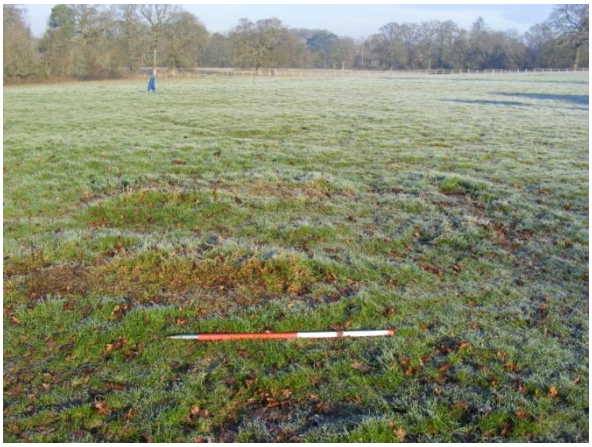

Photo 2: Remains of square structure (AB 7) viewed from the southeast

4.2.4 A shallow linear, positive earthwork is visible on the southwest side of Plot 1 (**AB 8, Photo 3**). This is approximately 3m wide and runs southeast – northwest for approximately 100m. There is a gap of approximately 20m and then it continues on the same alignment for approximately 3m up to the fence line and appears to continue for a approximately 2m on the other side of the fence, into Plot 2. This earthwork may be related to modern disturbance created by the insertion of modern services.

Photo 3: View towards the earthwork (AB 8) from the southeast

4.3 Plot 2 (Northern Field)

4.3.1 Plot 2 was also under short grass pasture at the time of the site visit. The boundaries consist of a former railway embankment along the western side with a concrete post and wire fence, a wooden stake and wire fence along the northern and southern sides and a wooden fence adjacent to a mature tree line along the eastern side. A small wooden area is present in the northeast corner of the field, adjacent to the railway embankment and the stream on the northern side.

4.3.2 A shallow negative linear earthwork (**AB 9, Photo 4**) is present along the line of the former field boundary. It runs east – west for a length of approximately 60m and is up to 2m wide. It deepens towards the southwest, where the banks are clearly visible and runs up to a brick

culvert (**AB 10**) with a small arch at the base (AB Heritage 2014, **AB 39**). This is likely to be the ditch associated with the former field boundary

Photo 4: Former field boundary ditch (AB 9) and culvert (AB 10), viewed from the northeast

4.3.3 Another brick culvert (**AB 11**) is located in the northwest corner of the field, where the stream is carried beneath the railway embankment. A mound of masonry rubble in the form of blocks of concrete and mortared bricks (**AB 12, Photo 5**) is located immediately behind the culvert (**AB 10**) at the southwest corner of the field.

Photo 5: Mound of masonry (AB 12) adjacent to the railway embankment, viewed from the north

4.3.4 A sub circular hollow earthwork (**AB 13, Photo 6**) is located adjacent to the former field boundary in Plot 2. The hollow earthwork is approximately 5m in diameter and is quite regular in shape. The origins of this feature are unclear.

Photo 6: Sub circular hollow (AB 13), viewed from the southwest

Table 2 Field Walk Features

AB No	Feature	Photo Numbers
AB 6	A small brick stack	1
AB 7	A small square low level earthwork	2
AB 8	A shallow Linear Positive Earthwork	3
AB 9	Shallow negative linear (former field boundary ditch)	4
AB 10	Brick Culvert	4
AB 11	Brick Culvert	-
AB 12	Masonry Rubble	5
AB 13	Sub Circular hollow earthwork	6

5. CONCLUSION

5.1.1 A Geophysical and Walkover Survey was undertaken by AB Heritage at land north of The Rosary, Partridge Green, West Sussex, on Monday 19th January to Wednesday 21st January 2015. The purpose of this was to understand the potential for any archaeological remains to survive undisturbed and, where possible, identify the form, function and extent of any remains.

5.1.2 The geophysical survey identified no archaeological features within the site. This may have been impacted by ploughing [**AB 5**] and modern disturbances[**AB1, 3, 4**] that was detected throughout the site.

5.1.3 The walkover survey, however, did find a number of features not recorded within the geophysical survey, which may include possible field boundaries [**AB 9**], and positive and negative earthworks [**AB 7-8, 13**]. It was confirmed though that in the main these were modern surface features [**AB 6- 7, 10-12**] with limited archaeological value.

5.1.4 Overall, based on the results of both surveys, it was concluded that there is a low potential for the survival of complex/significant below ground archaeology across the majority of the site. However, it is recommended that some targeted investigation be undertaken on specific earthwork features [**AB 7-9 & 13**] recorded during the walkover survey. This conclusion would need to be confirmed with the West Sussex Senior Archaeologist, John Mills.

6. ARCHIVE

6.1.1 The Site Archive will contain the following, as a minimum:

Table 3: Site Archive Data

Archive	Format
Raw Geophysical Data files	XYZ and Text
Processed geophysical data files and Photos	JPEG, BMAP
Archaeological Interpretation	Shape Files ARC GIS
Final Report	PDF
Final Images	PDF

6.1.2 A physical and digital archive will be stored in a suitable format at AB Heritage Limited offices in Taunton, Somerset.

7. REFERENCES

BGS (British Geological Society) 2014.*Geology of Britain viewer.*http://mapapps.bgs.ac.uk/geologyofbritain/home.html.

EH (English Heritage) 2014. The National Heritage List for England.http://www.english-heritage.org.uk/professional/protection/process/national-heritage-list-for-england/

IFA, 2011.Standard and Guidance for archaeological geophysical survey.IFA

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Appendices

Appendix 1 Technical Information on Geophysical Survey

FLUXAGTE MAGNETOMETRY SURVEY

The magnetic survey is carried out using a fluxgate gradiometer, which is a passive instrument consisting of two sensors mounted vertically 1m apart. The instrument is carried about 30cm above the ground surface and the top sensor measures the Earth's magnetic field, whilst the lower sensor measures the same field but is also more affected by any localised buried field. The difference between the two sensors will relate to the strength of a magnetic field created by a buried feature, if no field is present the difference will be close to zero as the magnetic field measured by both sensors will be the same.

Factors affecting the magnetic survey may include soil type, local geology, previous human activity, disturbance from modern services etc.

Survey equipment

The Bartington Grad 601-2 dual magnetic gradiometer is capable of surveying to an accuracy of 0.1 nanotesla (nT).

Sample interval and depth of scan

The magnetometer data is collected in 30mx30m grids at a resolution of 0.5m x 0.25m. This sample density is recommended for site evaluation (English Heritage, 2008). This equates to 7200 points per 30mx30m grid. The magnetometer has a typical depth of penetration of 0.5m to 1.0m. This would be increased if strongly magnetic objects are buried within the site.

Data capture and processing

The readings are logged continually by the data logger during the survey, which is then downloaded on site to a site laptop. At the end of each job, data is transferred to the office PC's for processing and presentation.

This 'regular xy' data is then downloaded into specialist data processing software, at user defined sample intervals (in this case 0.5 m by 0.25 m). This is processed as standard magnetometer data.

GPS METHODOLOGY

An RTK GPS (Real-time Kinematic Global Positioning System) can locate a point on the ground to sub-cm accuracy, a far greater accuracy than a standard GPS unit. An RTK system uses a base station receiver and a number of mobile units (rovers). The base station takes measurements from satellites in view and then broadcasts them along with its known position to the rover receivers. The rover receiver also collects measurements from the satellites in view and processes them with the base station data. The rover then computes its location relative to the base.

During such a survey a Trimble GeoXR Differential Global Positioning System (dGPS), capable of Real Time Kinematic (RTK) is used to set out a nominal grid prior to the survey. This increases the accuracy and efficiency of the survey. The data is then downloaded from the unit on the day, using a USB stick.

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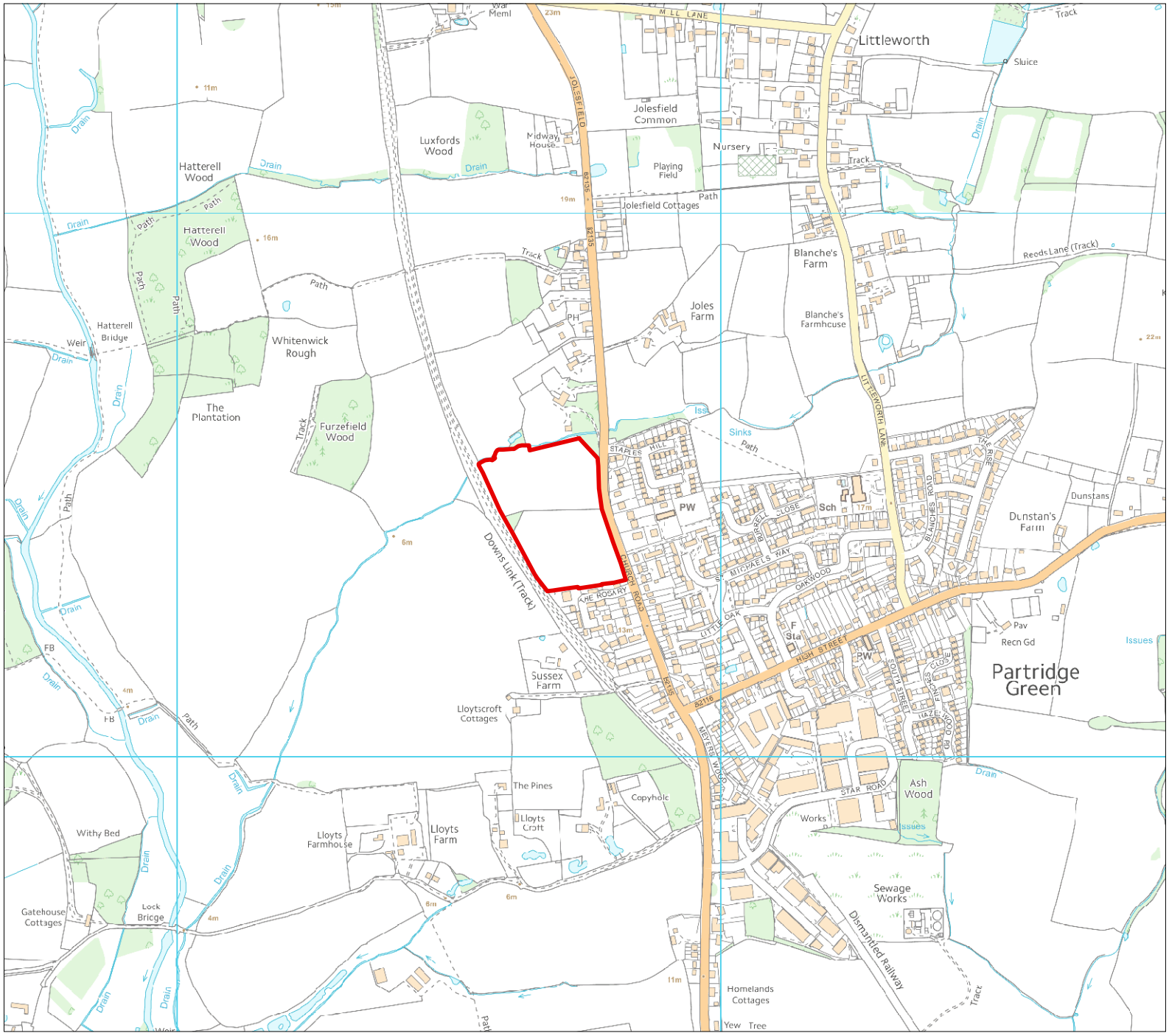

Legend

Site Boundary

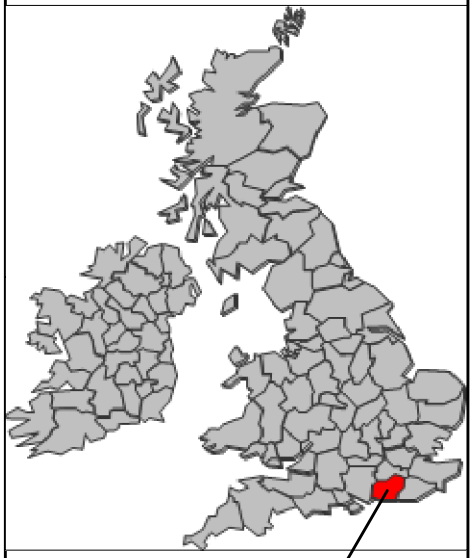

Figure1: Site Location

Project: The Rosary, West Sussex

Date: 02/02/15	Job Number: 10463
Drawn by: ZE	Approved by: GR

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Legend

Site Boundary

+2

Plotting Perameters

-2

Figure 2: Raw Geophysical Data

Project: The Rosary, West Sussex

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Legend

Site Boundary

+10

Plotting Perameters

-10

Figure 3: Processed Geophysical Data

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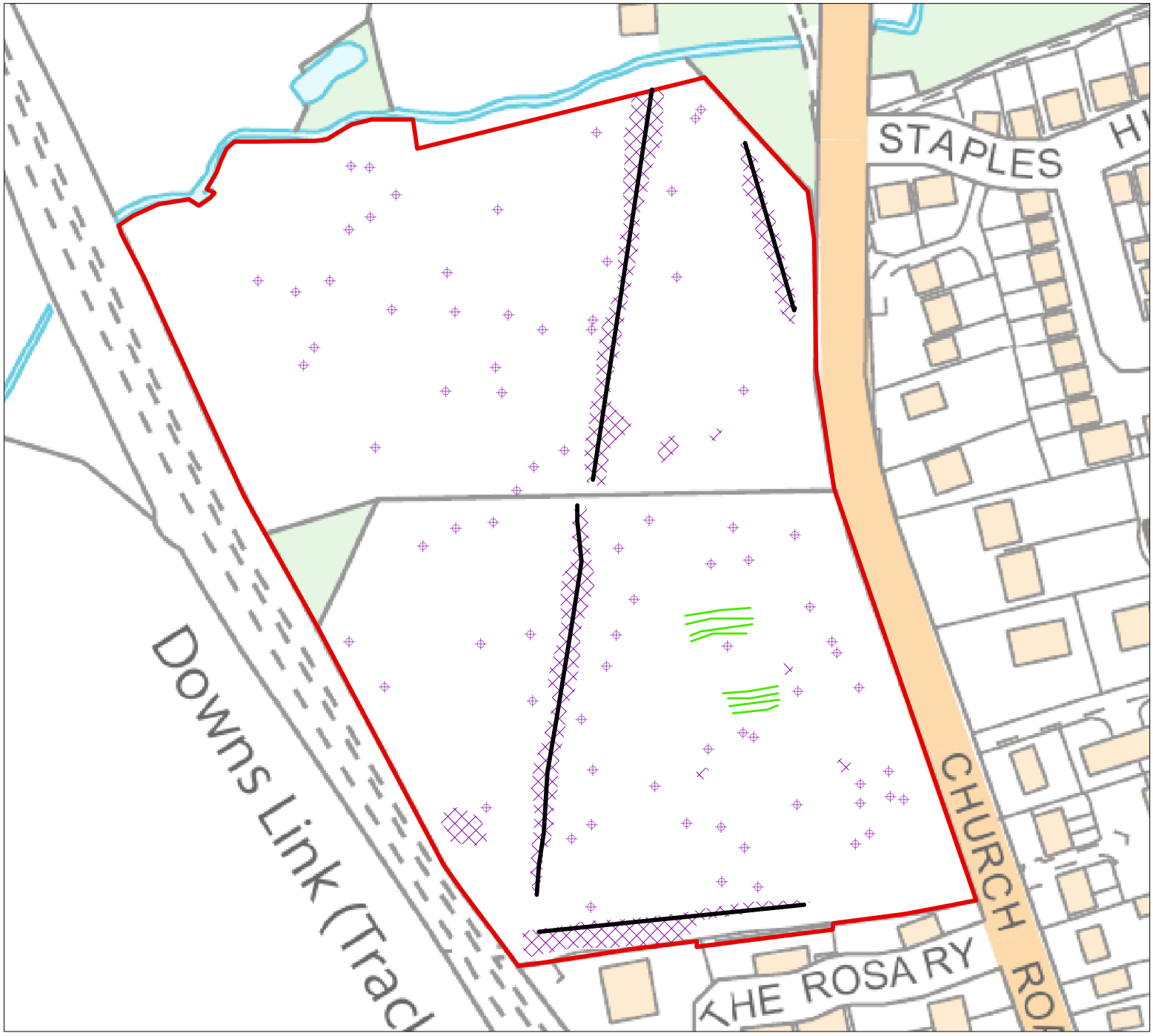

Legend

- Services [AB1]
- Magnetic Disturbance [AB2]
- Di-Polar Anomalies
- Possible Agricultural linear [AB4]
- Site Boundary

Figure 4: Interpretation of Geophysical Data

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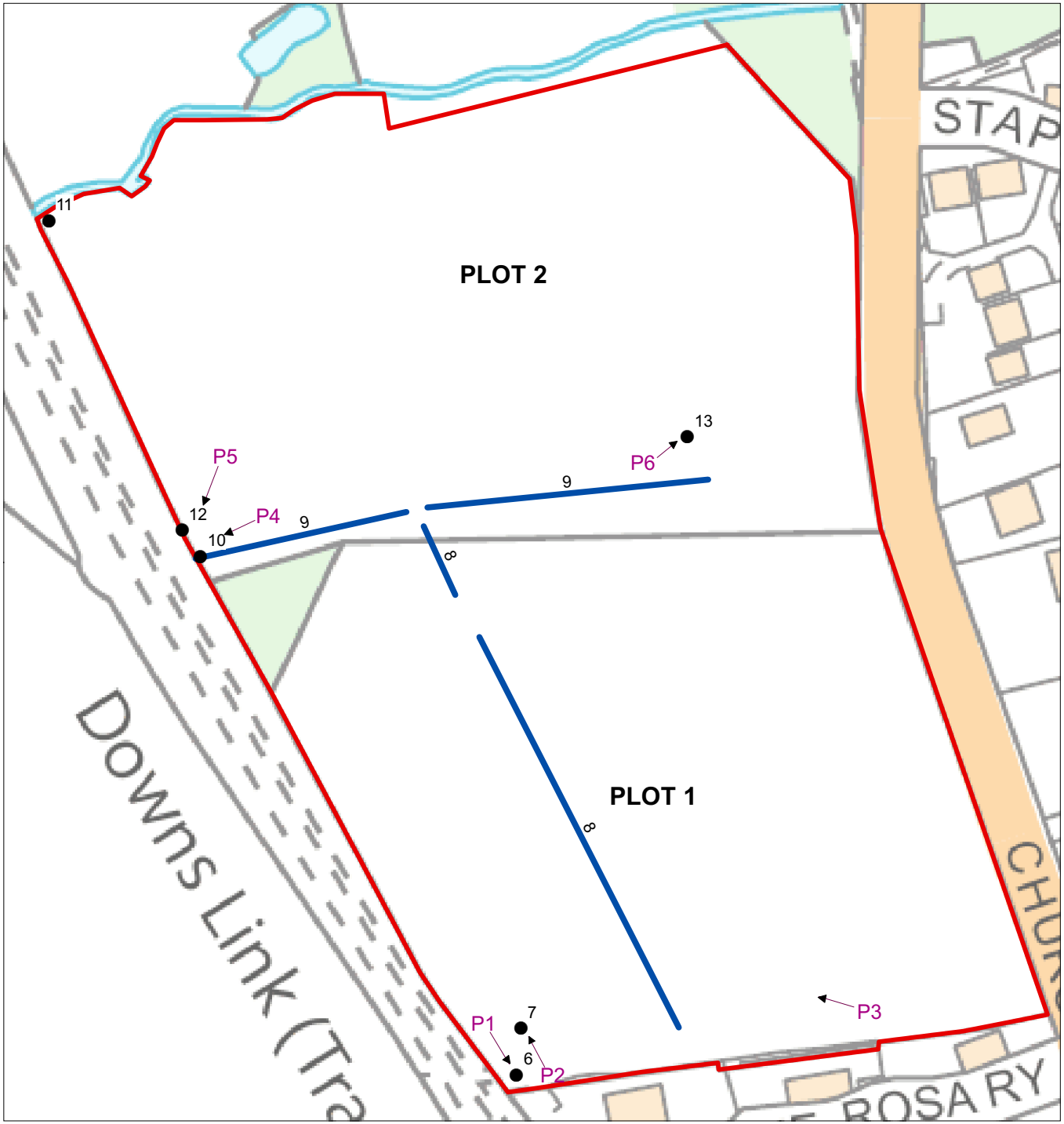

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Legend

Features (refer to [AB] numbers in report)

Site Boundary

P: Photo number referred to in report

0 25 50 100 m

Figure 5: Walkover Survey Plan

Project: The Rosary, West Sussex

Date: 29/01/15	Job Number: 10463
Drawn by: ZE	Approved by: GR

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