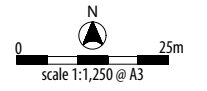


TYPE OF ANOMALY	INTERPRETATION
● dipolar isolated	ferrous material
● magnetic disturbance	ferrous material
● magnetic enhancement	quarrying?
— linear trend	agricultural
—	geological variation
● magnetic enhancement	geology
● magnetic enhancement	archaeology?
— negative trend	archaeology - bank?
● magnetic enhancement	archaeology - ditch

ABBREVIATIONS			
GV	geological variation	Q	quarry
P	pit	RD	ring-ditch

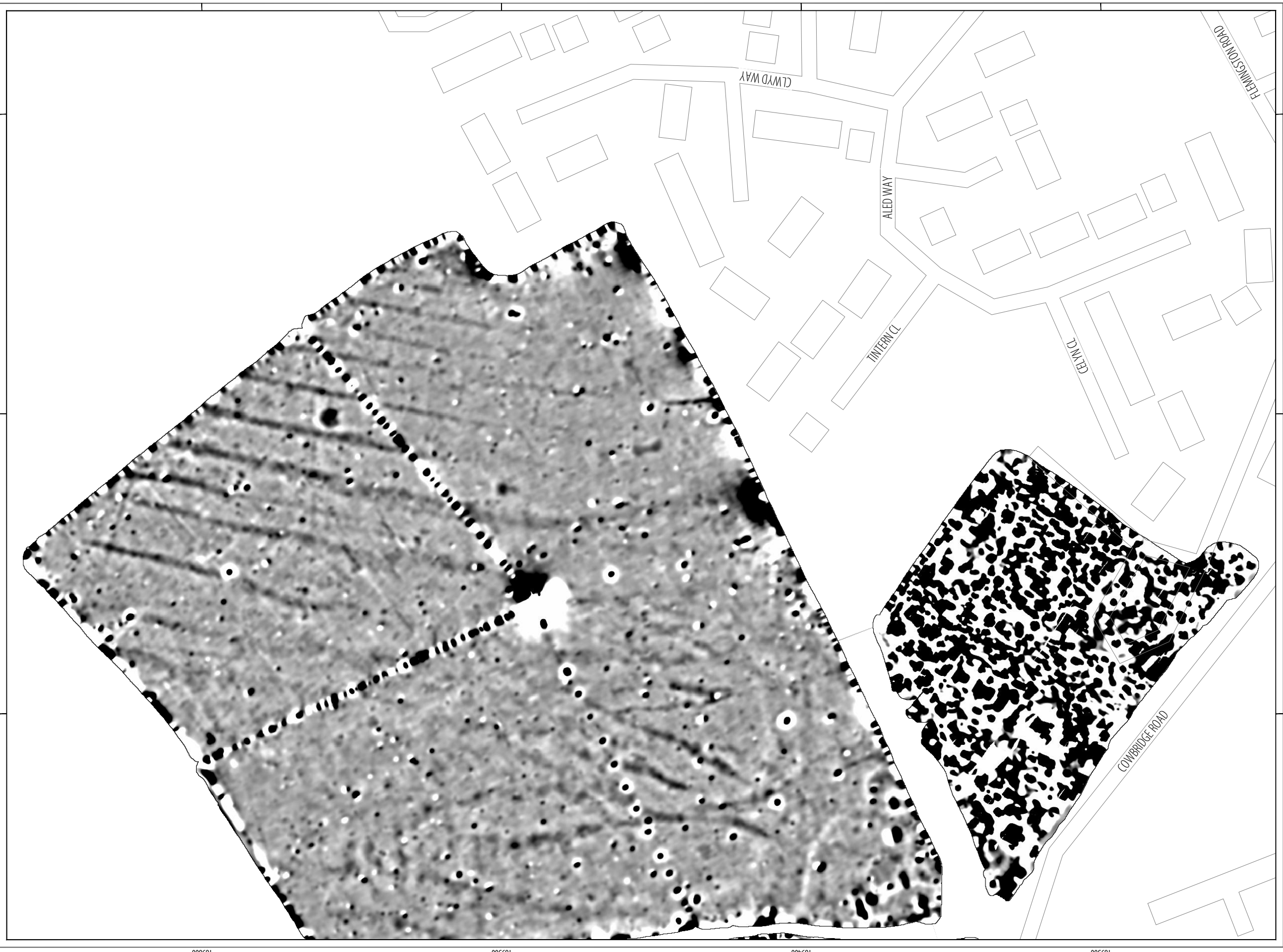


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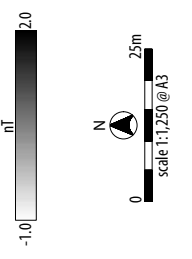
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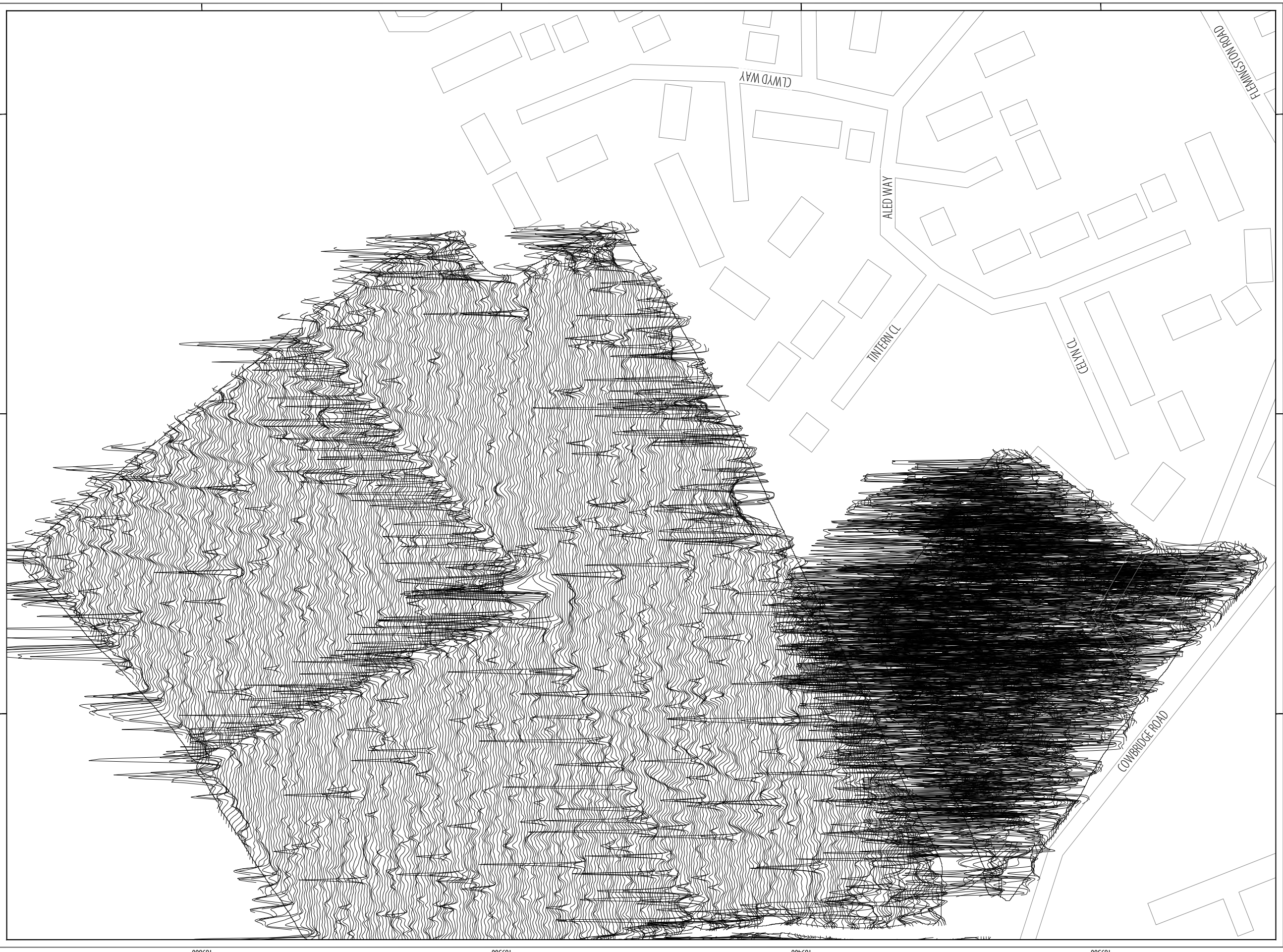
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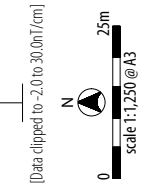
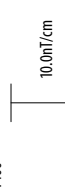
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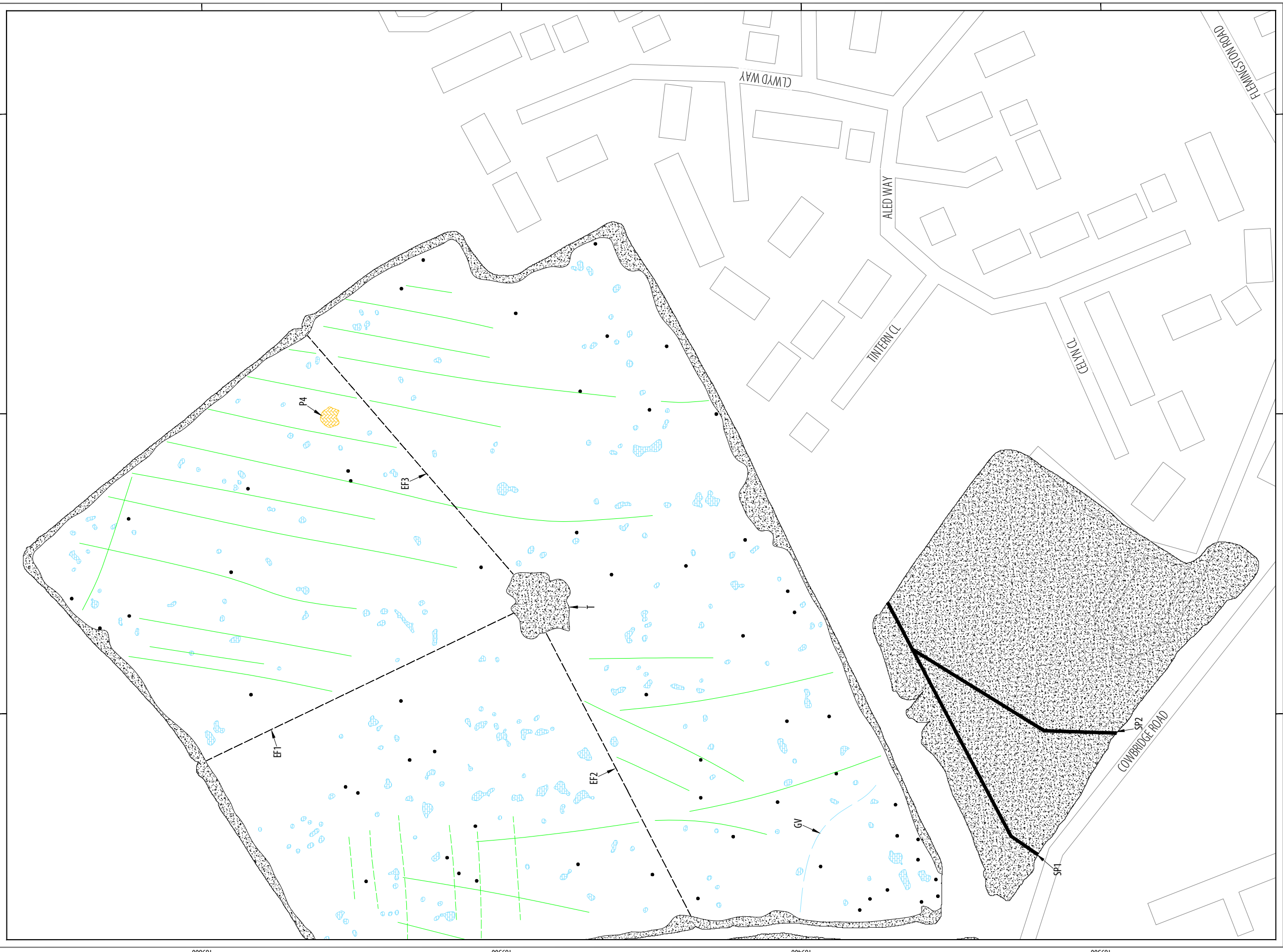


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ILLUS 11 XY trace plot of magnetometer data; Sector 2



TYPE OF ANOMALY	INTERPRETATION	TYPE OF ANOMALY	INTERPRETATION	ABBREVIATIONS	PROJECT	CLIENT
<ul style="list-style-type: none"> ● dipolar isolated ● magnetic disturbance — dipolar linear — dipolar linear — linear trend — linear trend 	<ul style="list-style-type: none"> ● ferrous material ● ferrous material ● service pipe — electric fence — ridge and furrow — agricultural 	<ul style="list-style-type: none"> — magnetic enhancement — magnetic enhancement — archaeological? 	<ul style="list-style-type: none"> — electric fence — geological variation — P — SP — T 	<ul style="list-style-type: none"> ● pit ● service pipe ● trough 	<p>CRSA/01 Cowbridge Road St Athan Vale of Glamorgan</p>	<p>Edenstone Homes</p>
<p>HEADLAND ARCHAEOLOGY Unit 16, Hillside, Beeston Road Leeds LS11 8ND 0113 387 6430 www.headlandarchaeology.com</p>			<p>NORTH</p> <p>0 25m scale 1:1,250 @ A3</p>			

ILLUS 12 Interpretation of magnetometer data; Sector 2

7 APPENDICES

APPENDIX 1 MAGNETOMETER SURVEY

Magnetic susceptibility and soil magnetism

Iron makes up about 6% of the Earth's crust and is mostly present in soils and rocks as minerals such as maghaemite and haematite. These minerals have a weak, measurable magnetic property termed magnetic susceptibility. Human activities can redistribute these minerals and change (enhance) others into more magnetic forms so that by measuring the magnetic susceptibility of the topsoil, areas where human occupation or settlement has occurred can be identified by virtue of the attendant increase (enhancement) in magnetic susceptibility. If the enhanced material subsequently comes to fill features, such as ditches or pits, localised isolated and linear magnetic anomalies can result whose presence can be detected by a magnetometer (fluxgate gradiometer).

In general, it is the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of topsoils, subsoils and rocks into which these features have been cut, which causes the most recognisable responses. This is primarily because there is a tendency for magnetic ferrous compounds to become concentrated in the topsoil, thereby making it more magnetic than the subsoil or the bedrock. Linear features cut into the subsoil or geology, such as ditches, that have been silted up or have been backfilled with topsoil will therefore usually produce a positive magnetic response relative to the background soil levels. Discrete feature, such as pits, can also be detected.

The magnetic susceptibility of a soil can also be enhanced by the application of heat. This effect can lead to the detection of features such as hearths, kilns or areas of burning.

Types of magnetic anomaly

In the majority of instances anomalies are termed 'positive'. This means that they have a positive magnetic value relative to the magnetic background on any given site. However some features can manifest themselves as 'negative' anomalies that, conversely, means that the response is negative relative to the mean magnetic background.

Where it is not possible to give a probable cause of an observed anomaly a '?' is appended.

It should be noted that anomalies interpreted as modern in origin might be caused by features that are present in the topsoil or upper layers of the subsoil. Removal of soil to an archaeological or natural layer can therefore remove the feature causing the anomaly.

The types of response mentioned above can be divided into five main categories that are used in the graphical interpretation of the magnetic data:

Isolated dipolar anomalies (iron spikes)

These responses are typically caused by ferrous material either on the surface or in the topsoil. They cause a rapid variation in the

magnetic response giving a characteristic 'spiky' trace. Although ferrous archaeological artefacts could produce this type of response, unless there is supporting evidence for an archaeological interpretation, little emphasis is normally given to such anomalies, as modern ferrous objects are common on rural sites, often being present as a consequence of manuring.

Areas of magnetic disturbance

These responses can have several causes often being associated with burnt material, such as slag waste or brick rubble or other strongly magnetised/fired material. Ferrous structures such as pylons, mesh or barbed wire fencing and buried pipes can also cause the same disturbed response. A modern origin is usually assumed unless there is other supporting information.

Linear trend

This is usually a weak or broad linear anomaly of unknown cause or date. These anomalies are often caused by agricultural activity, either ploughing or land drains being a common cause.

Areas of magnetic enhancement/positive isolated anomalies

Areas of enhanced response are characterised by a general increase in the magnetic background over a localised area whilst discrete anomalies are manifest by an increased response (sometimes only visible on an XY trace plot) on two or three successive traverses. In neither instance is there the intense dipolar response characteristic exhibited by an area of magnetic disturbance or of an 'iron spike' anomaly (above). These anomalies can be caused by infilled discrete archaeological features such as pits or post-holes or by kilns. They can also be caused by pedological variations or by natural infilled features on certain geologies. Ferrous material in the subsoil can also give a similar response. It can often therefore be very difficult to establish an anthropogenic origin without intrusive investigation or other supporting information.

Linear and curvilinear anomalies

Such anomalies have a variety of origins. They may be caused by agricultural practice (recent ploughing trends, earlier ridge and furrow regimes or land drains), natural geomorphological features such as palaeochannels or by infilled archaeological ditches.

APPENDIX 2 SURVEY LOCATION INFORMATION

An initial survey base station was established using a Trimble VRS differential Global Positioning System (dGPS). The magnetometer data was georeferenced using a Trimble RTK differential Global Positioning System (Trimble R8s model).

Temporary sight markers were laid out using a Trimble VRS differential Global Positioning System (Trimble R8s model) to guide the operator and ensure full coverage. The accuracy of this dGPS equipment is better than 0.01m.

The survey data were then super-imposed onto a base map provided by the client to produce the displayed block locations. However, it should be noted that Ordnance Survey positional accuracy for digital map data has an error of 0.5m for urban and floodplain areas, 1.0m for rural areas and 2.5m for mountain and moorland areas. This potential error must be considered if coordinates are measured off hard copies of the mapping rather than using the digital coordinates.

Headland Archaeology cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party.

APPENDIX 3 GEOPHYSICAL SURVEY ARCHIVE

The geophysical archive comprises:

- › an archive disk containing the raw data in XYZ format, a raster image of each greyscale plot, and a PDF of the report

The digital archive will be submitted to The National Monuments Record of Wales (NMRW) in accordance with the RCAHMS Guidelines for Archiving of Archaeological Projects (V13, 2013). The project will also be archived in-house in accordance with recent good practice guidelines (http://guides.archaeologydataservice.ac.uk/g2gp/Geophysics_3). The data will be stored in an indexed archive and migrated to new formats when necessary.



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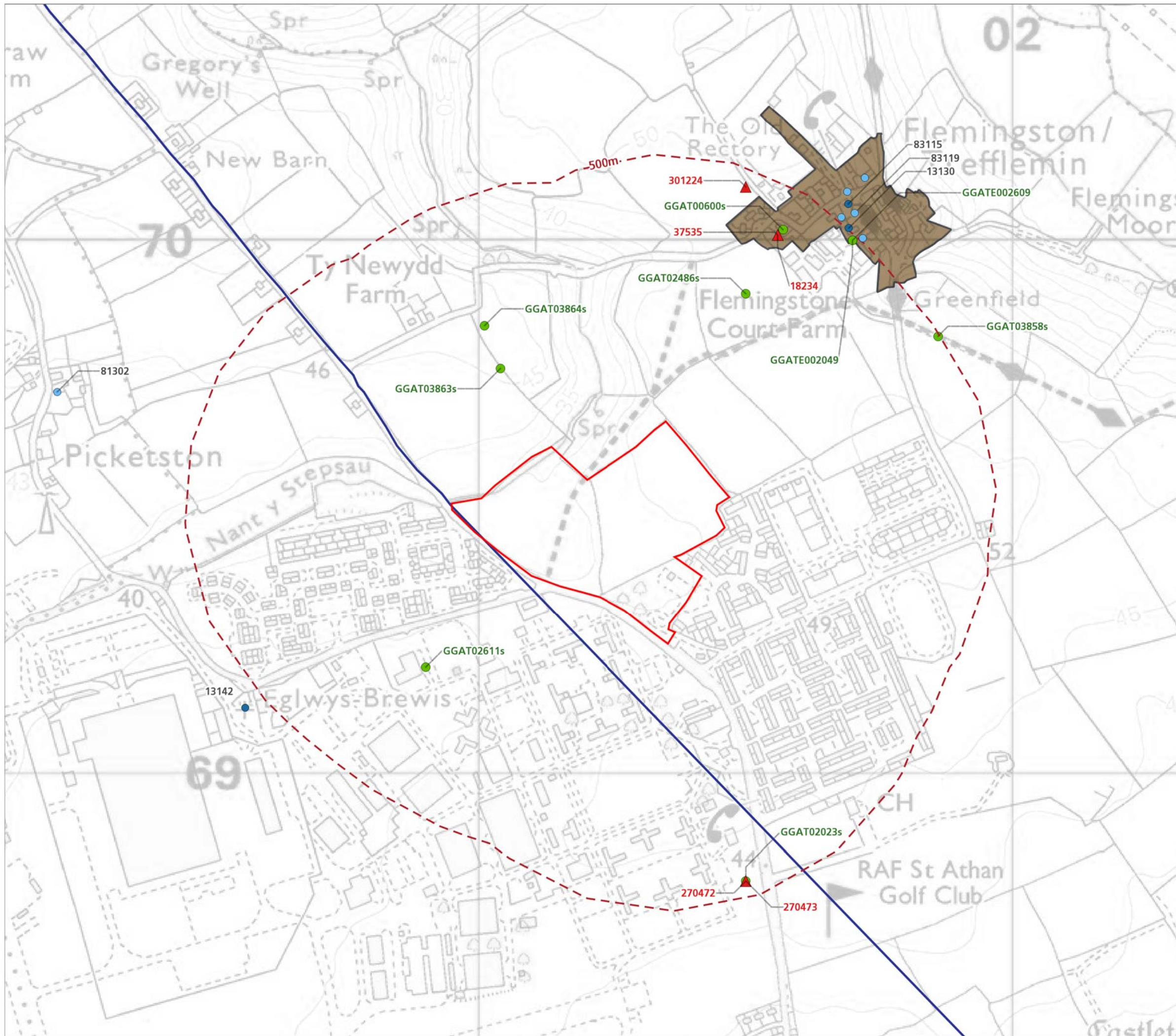
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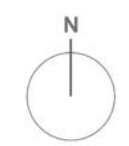
Plans

- Plan EDP 1** Known Heritage Assets
(EDP3504/02 30 September 2016 LH/RS)
- Plan EDP 2** Archaeological remains recorded during archaeological evaluation at the Defence Technical College and Aerospace Business Park, St Athan, (Wessex Archaeology, 2010)
(EDP3504/03 29 September 2016 LH/RS)
- Plan EDP 3** 1840 Tithe Map of Flemingston Parish
(EDP3504/04 29 September 2016 LH/RS)
- Plan EDP 4** 1878 Ordnance Survey Map
(EDP3504/05 29 September 2016 LH/RS)
- Plan EDP 5** 1971 Ordnance Survey Map
(EDP3504/29 14 September 2016 LH/RS)
- Plan EDP 6** Aerial photograph (WAG RAF 106 G UK 844 frame 4107 25 SEP 1945)
(EDP3504/07 29 September 2016 LH/RS)
- Plan EDP 7** Aerial photograph (WAG RAF 1 PRU 2470 Frame 122 06 JUL 1992)
(EDP 3504/08 29 September 2016 LH/RS)

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- Site Boundary
 - 500m Detailed Study Area
 - Conservation Area
 - Roman Road
 - ▲ RCAHMW data
 - HER Monuments
- Listed Building**
- Grade II*
 - Grade II



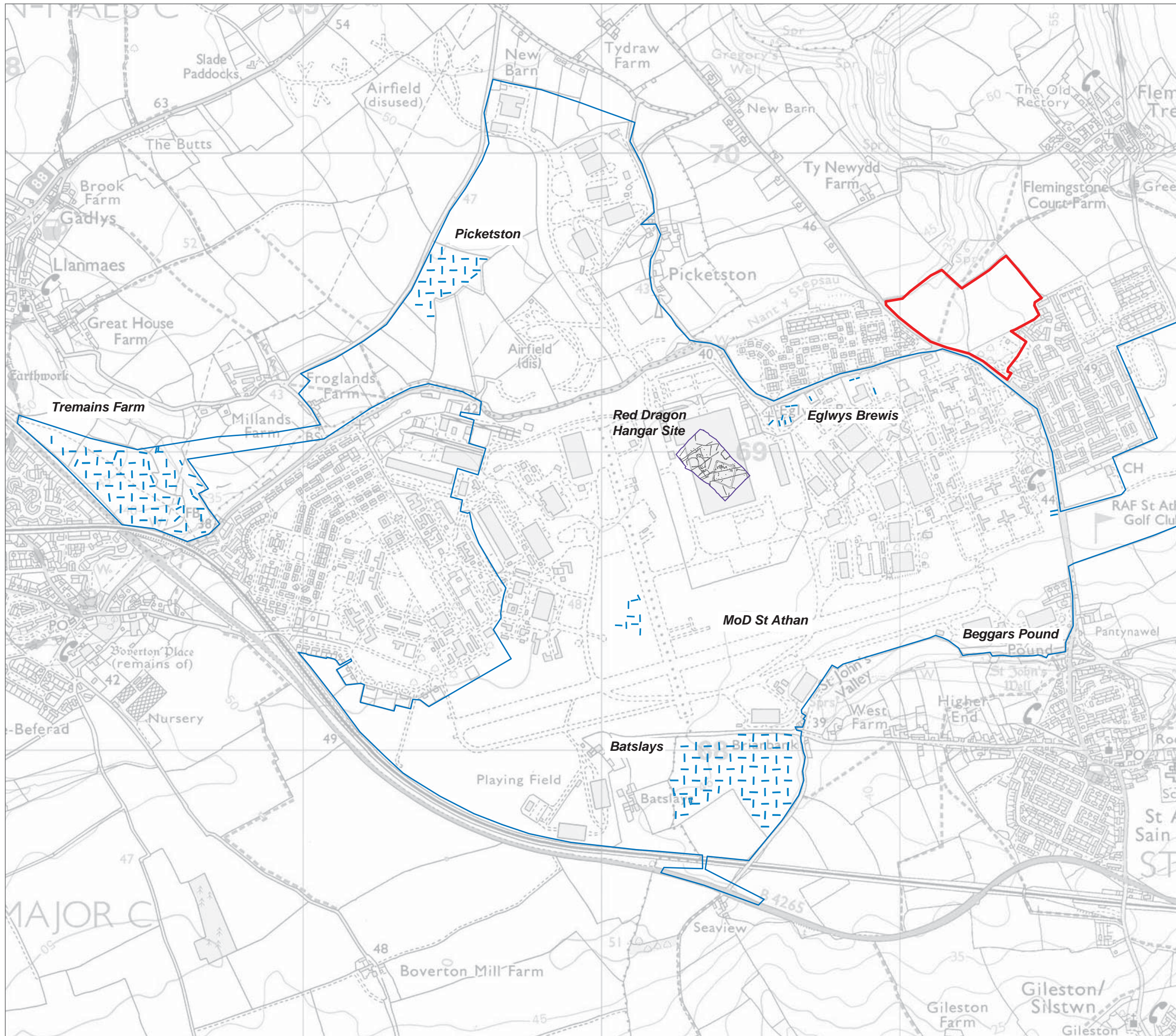
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 e info@edp-uk.co.uk www.edp-uk.co.uk

client
Edenstone Homes

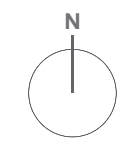
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Land off Cowbridge Road, St Athan, Vale of Glamorgan

drawing title
Plan EDP 1: Known Heritage Assets

date	30 SEPTEMBER2016	drawn by LH
drawing number	EDP3504/02	checked RS
scale	1:7,000 at A3	QA LH



- Site Boundary
- Boundary of Archaeological Evaluation Area
- Previous Excavation Area
- Previous Evaluation Trench



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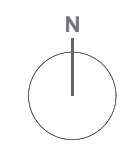
drawing title

**Plan EDP 2: Archaeological Remains recorded during
 archaeological evaluation at the Defence Technical
 College and Aerospace Business Park, St Athan
 (Wessex Archaeology, 2010)**

date	29 SEPTEMBER 2016	drawn by	LH
drawing number	EDP3504/03	checked	RS
scale	Refer to scale bar	QA	LH



 Approximate Site Boundary



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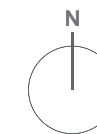
project title
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drawing title
Plan EDP 3: 1840 Tithe Map of Flemington Parish

date	29 SEPTEMBER 2016	drawn by	LH
drawing number	EDP3504/04	checked	RS
scale	Not to scale	QA	LH



 Approximate Site Boundary



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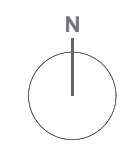
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**Plan EDP 4: 1878 Ordnance Survey
 Map**

date	29 SEPTEMBER 2016	drawn by	LH
drawing number	EDP3504/05	checked	RS
scale	Not to scale	QA	LH



 Approximate Site Boundary



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client

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project title

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drawing title

Plan EDP 5: 1971 Ordnance Survey Map

date	29 SEPTEMBER 2016	drawn by	LH
drawing number	EDP3504/06	checked	RS
scale	Not to scale	QA	LH