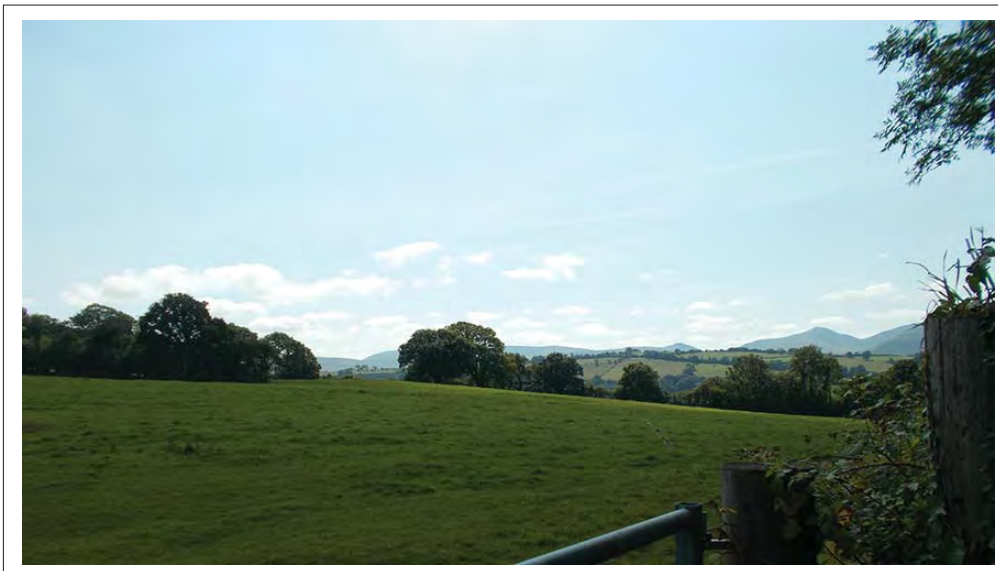


# *Archaeology Wales*

## **Land adjacent to Cerrigcochion Road, Brecon, Powys**

**Planning App No. 16/13596/FUL**

Geophysical Survey



By Philip Poucher

Report No: 1506

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# Archaeology Wales

## Land adjacent to Cerrigcochion Road, Brecon, Powys

Geophysical Survey

Prepared For: PAR Homes

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Date: 4/10/16

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By Philip Poucher

Report No. 1506

**September 2016**

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## **Non-Technical Summary**

*This report results from work carried out by Archaeology Wales Ltd (AW) for PAR Homes. It draws on the results of a geophysical survey undertaken on the site of a proposed development on land adjacent to Cerrigochion Road, Brecon, Powys, SO 0511 2890. The work took place to inform planning decisions relating to the proposed development on the advice of the Archaeologist at the Brecon Beacons National Park Authority.*

*The aim of the geophysical survey was to determine the nature and extent of any buried archaeological features within the proposed development area. The work was undertaken using a Bartington Grad601 gradiometer.*

*A number of linear and discrete features were identified throughout the survey area. The results were dominated by a series of former post-medieval and modern field boundaries, which have been removed in recent years. Several further linear features were identified. These appear largely associated with ploughing or the aforementioned field boundaries, or were the result of interference from modern features or represent naturally-occurring features. Similarly, several discrete features were identified, but these largely appear to be associated with modern features, some of which were visible at ground level, or likely agricultural activity.*

*The one exception is a possible L-shaped linear feature identified towards the northern end of the survey area, which may represent a former enclosure boundary. This is not associated with the known 19<sup>th</sup>/20<sup>th</sup> century field boundary identified in this area. It is possible, however, that this potential enclosure is associated with former late post-medieval agricultural buildings towards the northern end of the site. No associated features were identified within, or adjacent to, this enclosure.*

*The work was carried out to the Standard and Guidance set out by the Chartered Institute for Archaeologists for archaeological geophysical survey (CIfA 2014) and completed in accordance with Geophysical Survey in Archaeological Field Evaluation (English Heritage 2008). The archiving of the geophysical data will follow guidance laid down in Geophysical Data in Archaeology: A Guide to Good Practice 2nd edition (Schmidt 2002).*

# 1 Introduction

## 1.1 Location and scope of work

- 1.1.1 In September 2016, Archaeology Wales Ltd (AW) carried out a geophysical survey on the site of a proposed mixed-use development of residential units and employment space on land adjacent to Cerrigochion Road, Brecon, Powys, NGR SO 0511 2890 (Figs 1 & 2). The work was carried out at the request of PAR Homes (henceforth the client), to inform planning decisions relating to the proposed development, following a recommendation from the Heritage Officer (Archaeology) at Brecon Beacons National Park Authority (BBNPA-HO).
- 1.1.2 The proposed development currently consists of a single amalgamated field of improved pasture located on the northern edge of Brecon. The site covers an area of approximately 5 hectares.
- 1.1.3 A previous Desk-based Assessment (Hankinson 2015) was undertaken by Clwyd-Powys Archaeological Trust, along with a subsequent ASIDOHL (Poucher 2015) and Environmental Impact Assessment by Archaeology Wales, to help inform the planning decision. These reports identified a number of archaeological assets within the site area, comprising find-spots and a former post-medieval agricultural building. The site area itself was considered to have a low archaeological potential, although it lies in an area with a greater archaeological sensitivity. Subsequently, BBNPA-HO requested a programme of archaeological works in order to evaluate the nature, extent, preservation and significance of potential archaeological deposits on this site, and the impact of the proposed development upon them. A staged programme of investigation has been recommended, which in the first instance comprises a Geophysical Survey.
- 1.1.4 Subsequently, a Written Scheme of Investigations (WSI) was prepared by AW at the request of PAR Homes. It provided information on the methodology to be employed by AW during a geophysical survey of the site. The WSI was submitted to, and approved by, BBNPA-HO on behalf of the planning authority prior to the survey being undertaken.
- 1.1.5 The work was managed by Phil Poucher, Project Manager, and the site work was undertaken by Hywel Keen and Jerry Bond. The AW Project Number is 2370 and the Site Code CRB/16/GEO.

## **1.2 Site Description and Geology**

- 1.2.1** The development site lies on the northern edge of the nucleated settlement of Brecon, adjacent to the B4602 (Cerrigcochion Road) that runs north out of Brecon. The land consists of several fields, now amalgamated into a single field of improved but low quality grazing. The field is enclosed by hedgerows, stands of mature trees and post and wire fencing. The B4602 forms the western boundary, a public bridleway (Slwch Lane) forms the southern boundary, hedgerows bordering further agricultural land forms the eastern boundary and educational buildings belonging to Coleg Powys form the northern boundary.
- 1.2.2** The site is located on a west-facing hillside, with land sloping from *c.*190mOD in the north to *c.*175mOD in the south. To the east lies further agricultural land with land rising to the summit of Slwch Tump at 246mOD to the southeast and a television relay mast located *c.*150m to the east of site. To the south, beyond the wooded line of Slwch Lane, lies the War Memorial hospital and then the main nucleated settlement area of Brecon on ground that falls towards the River Usk. To the west on the opposing side of the B4602 lies the modern building complex of Brecon High School along with further urban development. To the north lies modern buildings of Coleg Powys and Ysgol-y-Bannau with the Brecon Leisure Centre and playing fields and further agricultural land beyond that.
- 1.2.3** The underlying bedrock geology of the area consists of interbedded sandstone and argillaceous rocks of the St Maughans Formation, overlain in places with sand and gravel from glaciofluvial ice contact deposits (British Geological Survey 2016).

## **1.3 Archaeological and Historical Background**

The following information is summarised from the Desk-based Assessment (Hankinson 2015) and Environmental Impact Assessment chapter (Poucher 2016):

- 1.3.1** A series of findspots are recorded within the site area, comprising a 17<sup>th</sup> century cloth seal (PRN 117657), an Elizabeth I silver coin dated to 1574 (PRN 120080), a jetton of possible French origin from the 15<sup>th</sup> century (PRN 119623), and a silver coin of Henry III, probably dating to 1218-22 (PRN 120082). At the northern end of the site area lie two buildings of later 19<sup>th</sup> (PRN 132205) and 20<sup>th</sup> century (PRN 132206) dates, that no longer survive above-ground.
- 1.3.2** Cerrigcochion Road, which forms the western boundary to the site, is believed to follow the route of a Roman Road (PRN 47027). Slwch Lane, which forms the

southern boundary to the site, is a hollow-way of possible medieval, and potentially earlier, origin (PRN 132208) that also functioned as the parish boundary marker.

- 1.3.3** Slwch Twmp hillfort (PRN 611/SAM BR063) lies within 400m to the east of the site. This would appear to be an Iron Age hillfort, but more recent examination of Lidar data by the RCAHMW and during the production of the EIA, has identified an extensive area of later enclosures to the north that appear to represent **medieval strip fields. These enclosures lie around the site of St Alud/Eluned's Chapel** (PRN 617), of reputed 5<sup>th</sup> century origin but which is also referred to in the early 12<sup>th</sup> century, which may also indicate an early medieval or medieval re-use of the hillfort. These presence of these sites raise the possibility of further archaeological remains within the general area around the proposed development.

## **2 Aims and Objectives**

### **2.1 Geophysical Survey**

2.1.1 The geophysical survey was undertaken in order to:

- Locate and describe archaeological features that may be present within the development area. The archaeological work was designed to attempt to elucidate the presence or absence of archaeological material that might be affected by the scheme, in particular its character, distribution, extent and relative significance.
- Provide sub-surface data to inform any future on-site works.

## **3 Methodology**

### **3.1 Geophysical Survey**

3.1.1 A Bartington Grad601 gradiometer was used to undertake the survey. Previous research has shown that fired, or cut and backfilled archaeological features such as kilns and hearths, ditches and pits often have an anomalously higher magnetic susceptibility than the surrounding subsoil due to burning and biological processes. Differences in magnetic susceptibility within the subsoil and archaeological features can be detected as changing magnetic flux by an instrument such as a gradiometer. Data from this may be mapped at closely

spaced regular intervals, to produce an image that may be interpreted to locate buried archaeological features (Clark, 1997) (Aspinall *et al*, 2011).

- 3.1.2 Relatively level fields of low pasture, such as this site, provide ideal locations for this type of survey. The surface of the field is relatively uniform allowing rapid traverses and readings to be taken at consistent heights above the ground surface, and the upper plough-soil is generally both neither deep enough to mask features cutting into the underlying subsoil, and unlikely to contain a significance amount of material that could interfere with the magnetic readings. The underlying geology of sandstone, overlain with sand and gravels, is also unlikely to provide a strong magnetic response that could distort the readings.
- 3.1.3 Detailed survey was carried out in grids of 30m x 30m along parallel traverses spaced at 1m intervals, recording data points spaced at 0.25m intervals to a maximum instrument sensitivity of 0.1nT in accordance with English Heritage Guidelines. The survey mode was set to bi-directional (traverses walked alternately south-north/north-south). At regular intervals the data was downloaded in the field onto a laptop computer for storage and assessment. The location of the survey area was then surveyed using a Topcon GTS 725 total station.

## 3.2 Data Processing and Presentation

- 3.2.1 Following the completion of the detailed survey, processing and analysis took place using the TerraSurveyor software package. After downloading, the results were plotted in 2D. The most typical method of visualising the data is as a greyscale image. In a greyscale, each data point is represented as a shade of grey, from black to white at either extreme of the data range. A number of standard operations (including destriping and despiking) were carried out to process the data. The mean level of each traverse of data was reduced to zero and all grids matched so that there were no differences between background levels. The data was then analysed using a variety of parameters and styles and the most useful of these were saved as \*JPEG images and displayed using Adobe Illustrator software. Due to the presence of strong magnetic anomalies, the data displayed was clipped to a range of +/-3 nT to allow finer details to be discerned. The results of the survey were then overlaid onto a digital map of the study area. This was then used to produce interpretation figures.
- 3.2.2 All works were undertaken in accordance with the CIfA's **Standards and Guidance** for a geophysical survey (2014) and current Health and Safety legislation.



## 4 Geophysical Survey Results

### 4.1 Limitations

- 4.1.1 The survey was undertaken during a period of generally dry and cloudy weather.
- 4.1.2 The development site comprises a single field of improved low pasture. The site is bounded by hedgerows, fronted by post-and-wire fencing (see Fig 4 and Appendix 1). The ground slopes gradually down to the west towards the line of the main road.
- 4.1.3 The field is accessed via a metal gateway towards the northwest corner. Beyond this gateway lies an area of hardstanding and modern building remains. The area is also covered with rubble and piles of breeze-blocks. This covers the area marked on modern mapping as yard and buildings along the northern boundary. Due to the presence of this material this area was unsuitable for surveying.
- 4.1.4 Towards the southeast corner of the site stand two mature trees, remnants of a former field boundary. To the east of this, in the corner of the survey area, stood a metal cattle feeding station. The area around this was left un-surveyed due to the likelihood of the metal affecting the magnetic readings and therefore the survey results in its vicinity. Overground services are also carried on telegraph poles across this corner of the site. Survey work was undertaken beneath them, but there is the potential that these services may have affected the magnetic readings in this area.
- 4.1.5 The presence of post-and-wire fencing around the site also prevented surveying to the very edges of the field, as the fence wire would obscure more subtle magnetic readings taken in the vicinity. This was particularly noticeable along the Cerrigochion Road boundary, and the eastern boundary.

### 4.2 Results of the Survey (Figs 5 & 6)

#### 4.2.1 *General*

The survey produced a large number of strong magnetic readings throughout the area, particularly in association with some former field boundaries, but included **a spread of strong 'spikes' throughout the field. Such strong responses are likely** to be associated with modern activity, and may indicate metallic items within the former field boundary ditches and throughout the topsoil. The even spread throughout the area is likely the result of modern agricultural ploughing. Faint

linear striations, orientated roughly northwest to southeast, throughout the survey data is an indicating of ploughing activity throughout the site.

As a result of these strong magnetic readings, the data required varying degrees of processing in order to identify any features of potential archaeological interest.

Four linear features were positively identified, with a further five potential linear features also suggested. A number of discrete magnetic responses are also highlighted.

#### 4.2.2 *Field Boundaries*

Features 01 and 02 are two linear features with very strong, largely dipolar, magnetic readings. The strength of the readings are likely to indicate metallic inclusions within the linear features, which would typically be an indication of modern activity. These two linear features align clearly with field boundaries visible on both historic and modern mapping, indicating they have only recently been removed. The strong responses are therefore likely to be from the modern disturbance and infilling created by their removal.

Feature 03 is a similar linear feature with strong magnetic readings, although somewhat less than Features 1 and 2. This feature also aligns well with a former field boundary, remnants of which are still visible on the ground in the form of two mature trees.

Towards the northern end of the survey area Feature 04 is a faint linear feature running from the area of modern disturbance to the north, to the field boundary represented by Feature 1. Feature 4 aligns with a modern former field boundary visible on modern mapping, but no longer apparent above ground.

#### 4.2.3 *Linear Features*

Towards the northern end of the field a possible L-shaped linear feature is identified as Feature 5. The magnetic readings for this feature were rather faint, as a result it required substantial clipping of the results in order to identify the feature. There is a suggestion that this linear feature runs towards the area of modern disturbance within the northern corner of the field, suggesting a possible association. However, the readings are uncharacteristically faint for a modern feature, and there appears little obvious relationship with the northwest-southeast orientated field boundary (Feature 01), which may suggest this represents an enclosure boundary pre-dating Feature 01. Historic map evidence indicates Feature 01 was established in the late 19<sup>th</sup> century. Indications of a

potential rectilinear feature in the southern corner of this feature is most likely to be the result of disturbance caused by Feature 01.

Similarly faint readings identified a possible nearby linear feature, identified as Feature 06. This feature however appears aligned with the 19<sup>th</sup> century field boundary (Feature 01), and is likely to represent ploughing scars, as further such ploughing scars are suggested in the general results in the vicinity.

Along the western boundary of the site faint readings give a rather diffuse suggestion of a linear feature, identified as Feature 07. On initial appearance the size and slight readings may suggest a possible track or roadway. However, the eastern boundary to this feature is very straight, and corresponds to the edge the survey grid. This suggests that the feature is in fact an artificial product of **discrepancies in the magnetic readings, possibly a 'shadowing' effect as the result** of the high readings from the post-and-wire fence to the west.

A possible curvilinear feature is suggested to the south, identified as Feature 08, adjacent to the field boundary represented by Feature 02. Again, however, the magnetic readings from this feature are very faint, and its location suggests a likely association with the field boundary itself.

A further curvilinear feature is suggested by faint magnetic readings in the south-eastern corner of the site, identified as Feature 09. Given the natural landform in this area, with ground rising to the east, it is possible these readings represent natural features in the underlying subsoil. It may also be of significance that overhead power lines cross the site from the corner of the field to the east, to the telegraph pole (Feature 13). The fact that this magnetic anomaly does partly follow the line of the powerlines so closely is strongly suggestive that it is not an archaeological feature.

A series of linear features have been identified towards the southern end of the surveyed area, identified as Feature 10. These features are represented by very faint magnetic anomalies, and appear both sinuous in nature and follow the natural ground slope. It is likely that these features represent naturally-occurring fluvial channels within the background subsoil.

#### 4.2.4 *Discrete Features*

Several larger discrete features are identified throughout the survey area, identified by their stronger magnetic readings, many of which can also be readily identifiable on the ground surface.

Three features along the western side of the survey area relate to recent geotechnical boreholes, all identified as Feature 11.

A metal water trough, lying underneath mature trees that form a remnant of a former field boundary, is identified as Feature 12.

A telegraph pole is identified at the eastern edge of the site as Feature 13.

Three further discrete features are not as readily identifiable at ground level. Towards the western edge of the site lies a strong magnetically positive reading, identified as Feature 14. The strength of the response suggests a metallic item, rather than a cut feature. Typically such features are likely to be modern in origin. To the east a similar magnetically positive reading is identified close to the corner of the former field enclosure, identified as Feature 15. The readings suggest there is a greater potential for this to represent a cut feature, of unknown function, although its location close to a former field corner suggests a possible association with those post-medieval field boundaries. Further to the east a very strong magnetically dipolar response is identified as Feature 16. The strength of the response indicates a metallic item, or items, likely to be modern in origin. Although not confirmed on the ground, the readings are very similar to the geotechnical boreholes visible to the west.

## **5 Interpretation and Discussion**

- 5.1.1** The prevalence of strong magnetic readings throughout the survey area is problematic, as strong readings have the potential to mask the presence of archaeological features. However, more subtle features are discernible after standard processing techniques have been used to examine the data, which suggests that significant archaeological remains have not been missed.
- 5.1.2** The site is largely dominated by a series of post-medieval and modern field boundaries, represented as Features 01-04, which have only been removed in recent years. Many of the remaining linear features appear to be of limited archaeological interest. Due to its location and alignment, Feature 06 is likely to represent a particularly prominent ploughing scar. Feature 07 is most likely to be a discrepancy in the recorded data, given that its eastern edge corresponds to the edge of the survey grids. Feature 08 appears to most likely be associated with the adjacent field boundary. Feature 09 corresponds very closely to overhead powerlines, and is therefore unlikely to represent an archaeological feature. Feature 10 would appear to represent a series of naturally-occurring water channels. The main exception would appear to be Feature 05, the form of which may suggest it represents an enclosure boundary, but one that does not align with the general late post-medieval and modern field boundaries. There is

a possibility however that it is connected with the collection of late post-medieval and modern agricultural buildings to the north, and no associated features are identified in the vicinity of this potential enclosure.

- 5.1.3** A spread of discrete features recorded throughout the survey area (Features 11-16) appear largely to relate to modern features, Feature 11, 12 and 13 are all visible on the ground as modern geo-technical boreholes, a water trough and a telegraph pole. Features 14 and 16 are not as readily identifiable, but are likely to represent modern metallic items or activity. Feature 15 may represent a cut feature, although its location close to the corner of a former field suggests it is likely to be associated with post-medieval agricultural activity.
- 5.1.4** In light of the findings further trial trenching is not considered necessary, and any potential features of archaeological interest can be protected via a planning condition which requires an Archaeological Watching Brief during construction.
- 5.1.5** Following approval, copies of this report will be sent to BBNPA and for deposition in the regional Historic Environment Record, held and maintained by Clwyd-Powys Archaeological Trust, Welshpool.

## **6 Bibliography and References**

Aspinall, A, Gaffney, C & Schmidt, A. 2011, *Magnetometry for Archaeologists*. Altamira, London

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Websites

British Geological Society online map resource  
(<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>)

# *Archaeology Wales*

## **Figures**

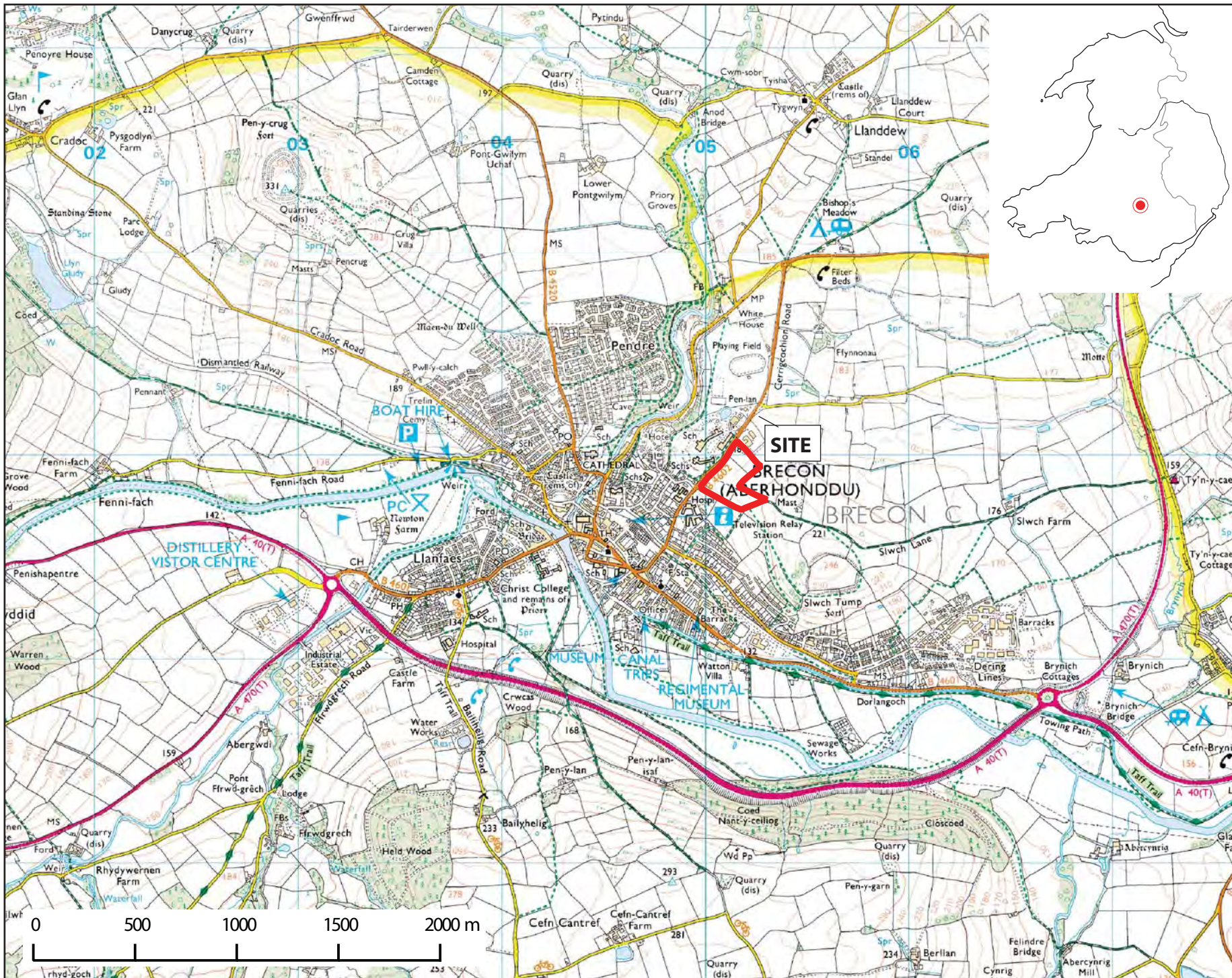


Figure 1: Site location plan.  
1:25,000 @ A4

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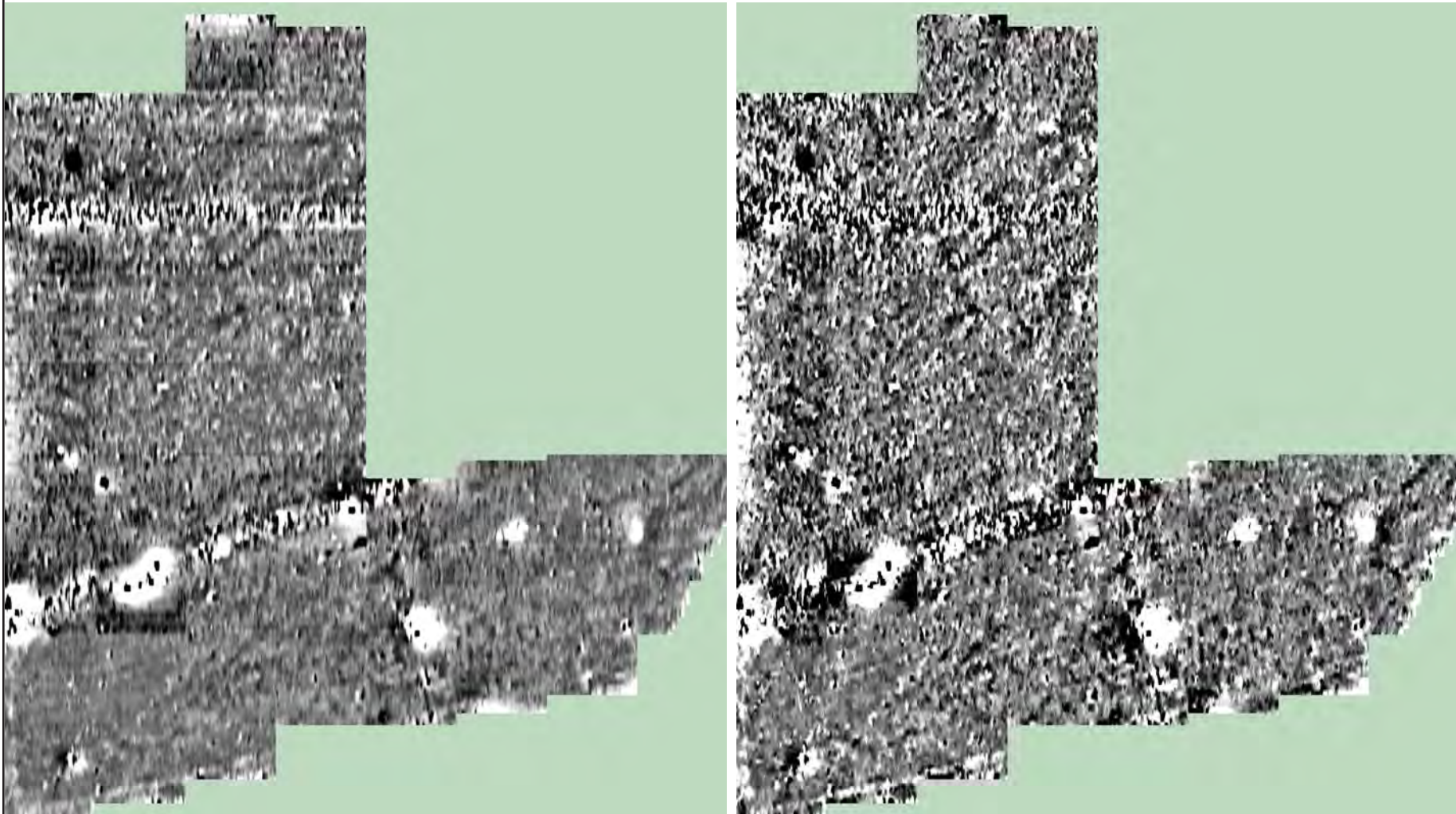




Figure 2: Location map, showing the outline of the proposed development site, and extent of area to be surveyed, in red. 1:2500 @ A4

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Processed data (compressed & destriped), clipped to +/- 3nT

Processed data (compressed & destriped), clipped to +/- 1.5nT

0m 100m

Figure 3: Geophysical survey results presented as grey-scale plots



Figure 4: Geophysical survey results (clipped to +/- 3nT) located within the proposed development site (outlined in red).

1:2500 @ A4

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Figure 5: Interpretation layer. Features and numbers referred to in the main text.

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Photo 1: View north across the site. Cerrigochion road runs to the left, Coleg Powys buildings are visible just beyond the northern boundary



Photo 2: View east, towards the southeast corner of the site, showing the overhead powerlines crossing the site.



Photo 3: View south, showing the mature trees and water trough (Feature 11)



Photo 4: View southeast across the site towards the television relay mast. The dark line of a former field boundary is visible emerging from the bottom left.

# *Archaeology Wales*

## **Appendix I**

### **Written Scheme of Investigations**

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Written Scheme of Investigation  
For a Geophysical Survey:  
Land adjacent to Cerrigcochion Road,  
Brecon, Powys

Prepared for:  
PAR Homes

Project No: 2370

7<sup>th</sup> September 2016

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## NON TECHNICAL SUMMARY

*This Written Scheme of Investigation (WSI) details the proposal for geophysical survey of land adjacent to Cerrigochion Road, Brecon, Powys. It has been prepared by Archaeology Wales Limited for PAR Homes.*

### 1. Introduction

The proposed development comprises plans for a mixed-use development of residential units and employment space on land adjacent to Cerrigochion Road, Brecon, Powys (henceforth – the site), centred on NGR SO 0511 2890 (Figure 1 and 2). The local planning authority is the Brecon Beacons National Park Authority (henceforth – BBNPA), and the planning application number is 16/13596/FUL.

The recommendations for a geophysical survey on the site have been proposed by the Heritage Officer (Archaeology) of BBNPA, in their capacity as archaeological advisor to BBNPA. These recommendations are made in response to a desk based assessment, ASIDOHL and Environmental Impact Assessment of the site, submitted to accompany the planning application. These documents highlight the archaeological sensitivity of the area, and the Heritage Officer has requested a programme of archaeological works in order to evaluate the nature, extent, preservation and significance of any archaeological deposits that may survive on this site, and the impact of the proposed development upon them. A staged programme of investigation has been recommended, which in the first instance comprises a Geophysical Survey of the site.

This WSI has been prepared by Philip Poucher, Archaeology Wales Ltd (Henceforth - AW) at the request of PAR Homes. It provides information on the methodology that will be employed by AW during a geophysical survey of the site. This WSI is to be approved by the local planning authority, prior to the survey being undertaken.

All work will conform to the Standard and Guidance for Geophysical Survey (CIfA December 2014) and be undertaken by suitably qualified staff to the highest professional standards.

### 2 Site Description & Archaeological Background

The site lies on the northern edge of the nucleated settlement of Brecon, adjacent to the B4602 (Cerrigochion Road) that runs north out of Brecon. The land consists of several fields, now amalgamated into two main fields, of improved but low quality grazing. The fields are enclosed by hedgerows, stands of mature trees and some post and wire fencing. The B4602 forms the western boundary, a public bridleway (Slwch Lane) forms the southern boundary, hedgerows bordering further agricultural land forms the eastern boundary and educational buildings belonging to Coleg Powys form the northern boundary.

The site is located on a west-facing hillside, with land sloping from c.190mOD in the north to c.175mOD in the south. To the east lies further agricultural land with land rising to the summit of Slwch Tump at 246mOD to the southeast and a television relay mast located c.150m to the east of site. To the south, beyond the wooded line of Slwch Lane, lies the War Memorial hospital and then the main nucleated settlement



area of Brecon on ground that falls towards the River Usk. To the west on the opposing side of the B4602 lies the modern building complex of Brecon High School along with further urban development. To the north lies modern buildings of Coleg Powys and Ysgol-y-Bannau with the Brecon Leisure Centre and playing fields and further agricultural land beyond that.

The underlying bedrock geology of the area consists of interbedded sandstone and argillaceous rocks of the St Maughans Formation, overlain in places with sand and gravel from glaciofluvial ice contact deposits.

A previous Archaeological Desk-Based Assessment and Environmental Impact Assessment have been undertaken, which detail the historical and archaeological background to the site. In summary, a number of specific archaeological sites and areas of archaeological potential have been identified within or in close proximity to the proposed development area.

A series of findspots are recorded within the site area, comprising a 17<sup>th</sup> century cloth seal (PRN 117657), an Elizabeth I silver coin dated to 1574 (PRN 120080), a jetton of possible French origin from the 15<sup>th</sup> century (PRN 119623), and a silver coin of Henry III, probably dating to 1218-22 (PRN 120082). At the northern end of the site area lie two buildings of later 19<sup>th</sup> (PRN 132205) and 20<sup>th</sup> century (PRN 132206) dates, that no longer survive above-ground.

Cerrigcochion Road, which forms the western boundary to the site, is believed to follow the route of a Roman Road (PRN 47027). Slwch Lane, which forms the southern boundary to the site, is a holloway of possible medieval, and potentially earlier, origin (PRN 132208) that also functioned as the parish boundary marker.

Slwch Twmp hillfort (PRN 611/SAM BR063) lies within 400m to the east of the site. This would appear to be an Iron Age hillfort, but more recent examination of Lidar data by the RCAHMW and during the production of the EIA, has identified an extensive area of later enclosures to the north that appear to represent medieval strip fields. These enclosures lie around the site of **St Alud/Eluned's Chapel (PRN 617)**, of reputed 5<sup>th</sup> century origin but which is also referred to in the early 12<sup>th</sup> century, which may also indicate an early medieval or medieval re-use of the hillfort. These presence of these sites raise the possibility of further archaeological remains within the general area around the proposed development.

### 3 Objectives

The primary objective of the work will be locate and describe, by means of geophysical survey, archaeological features that may be present within the development area. The proposed archaeological work will attempt to elucidate the presence of absence of archaeological material that might be affected by the scheme, in particular its character, distribution, extent and relative significance.

A report will be produced that will provide information which is sufficiently detailed to allow informed planning decisions to be made that can safeguard the archaeological resource. The information could then be used to determine further archaeological investigation or appropriate mitigation strategies for any archaeological remains within the area to be implemented prior to or during the proposed development.

#### 4 Methodology for geophysical survey

The area to be surveyed will include all of the accessible development area (see the attached plan, Figure 2). On-site adjustments may be required to avoid areas of magnetic interference or inaccessibility.

The site will be located by GPS. All survey points will be located with a total station or similar survey equipment and plotted onto an O.S. base map.

The on-site survey will be undertaken in a single phase lasting approximately four days. This will be followed by report production.

The survey will be carried out using a Bartington Grad601 Magnetometer. This is chosen as an efficient and effective method of locating archaeological anomalies on this type of site. The machine consists of two high stability fluxgates gradiometers suspended on a single frame, accurately aligned, that can detect localised magnetic anomalies compared with the general magnetic background. When mapped in a systematic manner this allows changes in the magnetic field resulting from differing features in the soil to be plotted. Strong magnetic anomalies will be generated by iron-based objects or areas of heat-activity, such as hearths and kilns. More subtle anomalies may be generated by changes, typically in the iron-oxide content, of underlying soils, compared to the natural subsoil. This helps to detect infilling material of features such as ditches and pits, as well as overlying material such as wall lines.

Relatively level fields of low pasture, such as this site, provide ideal locations for this type of survey. The surface of the field is relatively uniform allowing rapid traverses and readings to be taken at consistent heights above the ground surface, and the upper ploughsoil is generally both neither deep enough to mask features cutting into the underlying subsoil, and unlikely to contain a significant amount of material that could interfere with the magnetic readings. The underlying geology of sandstone, overlain with sand and gravels, is also unlikely to provide a strong magnetic response that could distort the readings.

Each survey area will be divided into 30m square grids along a common alignment. Within each grid, parallel traverses 1m apart will be walked at rapid pace along the same orientation. Instrument readings will be logged at 0.25m intervals, with an average cycle of 4 using an ST1 internal sample trigger. Incomplete survey lines resulting from irregular area boundaries or obstacles will be completed using the **"dummy log" key**.

Further survey information will be completed on the relevant pro-forma sheet. All data will be downloaded in the field into a laptop computer. The location of the grid corners will be recorded using a total station or similar survey equipment so that results can be accurately placed onto an OS map.

A composite of each detailed survey area will be created and processed using the software package *Terrasurveyor v.3*. A variety of processing tools will be used to enhance any potential archaeology. The final results will be presented at an appropriate scale tied to the Ordnance Survey National Grid.

## 5 Monitoring

The Heritage Officer at BBNPA will be contacted approximately one week prior to the commencement of site works, and subsequently once the work is underway.

Any changes to this WSI that AW may wish to make after approval will be communicated to the Heritage Officer for approval on behalf of the Planning Authority.

BBNPA will be given access to the site so that they can monitor the progress of the work, they will be kept regularly informed about developments, both during the site works and subsequently during the post-fieldwork programme.

## 6 Stage 4 - Archiving and Reporting

### *Site archive*

An ordered and integrated project archive will be prepared in accordance with the National Monuments Record agreed structure and be deposited within an appropriate body upon completion of the work.

### *Final reporting*

The client report will contain, as a minimum, the following elements:

- Concise non-technical summary of the results
- Description of, and reasoning behind, geophysical survey technique
- Detailed plans of the site and survey results
- Site illustrations, related to Ordnance Datum
- Written description
- Written interpretation of results along with illustrated interpreted site plan
- Statement of local and regional context
- Conclusions as appropriate
- Bibliography
- A copy of the AW Specification

Copies of the report will be sent to the Client, and a copy of the report will be sent to the Heritage Officer (Archaeology) at BBNPA for approval. Following approval a copy will also be sent to BBNPA and the regional Historic Environment Record. Digital copies will be provided in pdf format if required.

A summary report of the work will be submitted for publication to a national journal no later than one year after the completion of the work.

## 7 Resources and timetable

### Standards

The field evaluation will be undertaken by AW staff using current best practice.

AW is an CIfA Registered Archaeological Organisation and all work will be undertaken to the standards and guidelines of the CIfA.

### Staff

The project will be undertaken by suitably qualified AW staff, supervised by Hywel Keen. Overall management of the project will be undertaken by Philip Poucher.

### Equipment

The project will use a Bartington Grad601 set to standard specifications.

### Timetable of archaeological works

The work will be undertaken at the convenience of the client. No start date has yet been agreed, but it is anticipated that work will commence shortly after approval of this WSI. It is anticipated that the fieldwork element could take in the region of four days.

### Insurance

AW holds Public Liability Insurance through Aviva Insurance Ltd, with a £5,000,000 Limit of Indemnity (expires 05/12/16), Employers Liability Insurance through Aviva Insurance Ltd, with a £10,000,000 Limit of Indemnity (expires 05/12/16) and Professional Indemnity Insurance through Hiscox Insurance Company Ltd, with a £1,000,000 Limit of Indemnity (expires 05/12/16).

### Arbitration

In the event of any dispute arising out of this Agreement (including those considered as such by only one of the parties) either party may forthwith give to the other notice in writing of such a dispute or difference and the same shall be and is hereby referred **for decision in accordance with the Rules of the Chartered Institute of Arbitrators'** Arbitration scheme for the Institute for Archaeologists applying at the date of this Agreement.

### Health and safety

All members of staff will adhere to the requirements of the *Health & Safety at Work Act*, 1974, and the Health and Safety Policy Statement of AW.

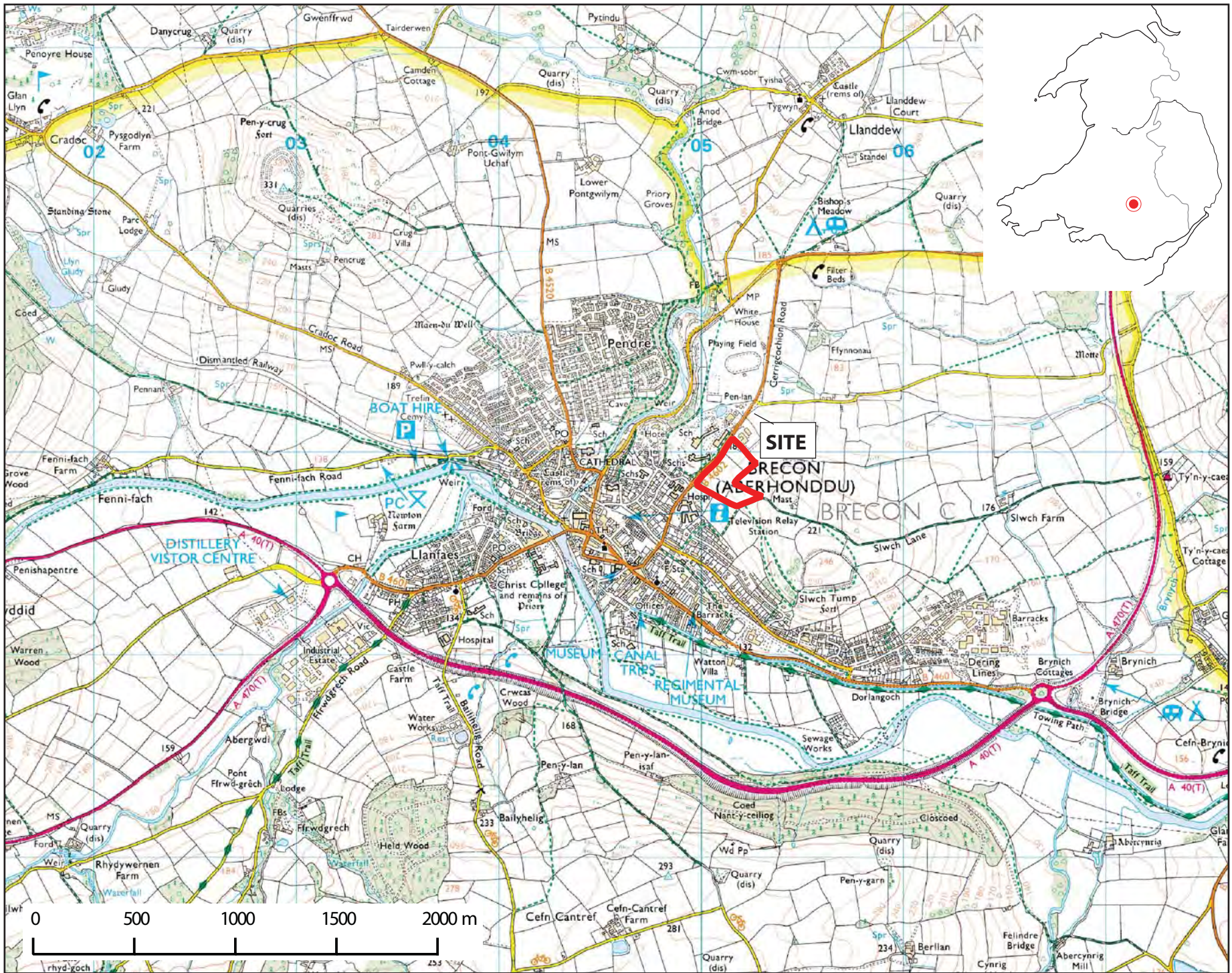


Figure 1: Site location plan.  
1:25,000 @ A4

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Figure 2: Location map, showing the outline of the proposed development site, and extent of area to be surveyed, in red. 1:2500 @ A4

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