PROPOSED FLOOD BUND, AMMANFORD, CARMARTHENSHIRE: GEOPHYSICAL SURVEY 2021

DAT Archaeological Services

Prepared by Dyfed Archaeological Trust
For: Ove Arup & Partners.

REGISTERED ORGANISATION CIfA

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PROPOSED FLOOD BUND, AMMANFORD, CARMARTHENSHIRE: GEOPHYSICAL SURVEY 2021

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EXECUTIVE SUMMARY

DAT Archaeological Services were commissioned to undertake a geophysical survey on land near Ammanford, Carmarthenshire proposed for the construction of a new flood bund.

The purpose of the survey was to provide a better indication of the archaeological potential of the site and if required, enable targeting of any further archaeological mitigation requirements before or during the proposed development.

The results of the geophysical survey did not reveal evidence of potential archaeology within the development area.

CRYNODEB GWEITHREDOL

Comisiynwyd Gwasanaethau Archeolegol YAD i ymgymryd arolwg geoffisegol ar dir ger Rhydaman, Sir Gaerfyrddin ar gyfer adeiladu bwnd llifogydd newydd.

Pwrpas yr arolwg oedd rhoi gwell arwydd o botensial archeolegol y safle ac, os oes angen, galluogi targedu unrhyw ofynion lliniaru archeolegol pellach cyn neu yn ystod y datblygiad arfaethedig.

Ni ddatgelodd canlyniadau'r arolwg geoffisegol dystiolaeth o archeoleg bosibl yn yr ardal ddatblygu.

PROPOSED FLOOD BUND, AMMANFORD, CARMARTHENSHIRE: GEOPHYSICAL SURVEY 2021

SUMMARY

DAT Archaeological Services were commissioned by Ove Arup & Partners Ltd to undertake a geophysical survey on land near Ammanford, Carmarthenshire proposed for the construction of a new flood bund, centred on NGR SN 6234 1313. The site covers an area of approximately 1.8 hectares and is situated on the floodplain of the Afon Loughor to the northwest of Ammanford town.

Following a desk-based assessment by DAT Field Services in 2018 a geophysical survey was recommended due to the moderate potential for Bronze Age remains to survive within the area, given the proximity of known prehistoric burnt mounds and round barrows.

In total, an area measuring 1.21ha was surveyed. Generally, the quality of the survey data was good, but no evidence of potential archaeological features was recorded within the development area.

1. INTRODUCTION

1.1 Project Commission

1.1.1 DAT Archaeological Services were commissioned by Ove Arup & Partners Ltd to undertake a geophysical survey on land near Ammanford, Carmarthenshire proposed for the construction of a new flood bund, centred on NGR SN 6234 1313 (Figure 1). The site covers an area of approximately 1.8 hectares and is situated on the floodplain of the Afon Loughor to the northwest of Ammanford town. The site is bordered by the Afon Loughor to the north, the Heart of Wales railway line to the east and Shands Road, a minor road, to the west.

1.1.2 A Historic Environment Desk-Based Assessment was previously prepared by DAT Archaeological Services (Enright 2018) and highlighted the moderate potential for Bronze Age remains within the development area, given the proximity of known prehistoric burnt mounds and round barrows.

1.1.3 The geophysical survey was undertaken using a fluxgate gradiometer which detects subtle variations in the earth's magnetic field, which can indicate the presence of buried features such as ditches, pits, walls or postholes, which are not visible on the ground surface.

1.1.4 The purpose of the geophysical survey was to provide a better indication of subsurface features which could be indicative of archaeology.

1.1.5 The results of the survey will allow for an informed decision on whether any further archaeological mitigation is required or not before or during the development programme.

1.2. Scope of the Project

1.2.1 The aim of the project was:

- To identify the presence/absence of any potential archaeological deposits through an initial gradiometer survey;
- To establish the character and extent of any potential archaeological remains within the site area that could be affected by the proposed works;
- To prepare a report and archive on the results of the geophysical survey.

1.3 Report Outline

1.3.1 This report provides a summary and discussion of the geophysical survey and its results and puts those results within their regional and national context.

1.4 Abbreviations

1.4.1 Sites recorded on the regional Historic Environment Record (HER) are identified by their Primary Record Number (PRN) and located by their National Grid Reference (NGR). Sites recorded on the National Monument Record (NMR) held by the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) are identified by their National Primary Record Number (NPRN). Altitude is expressed to Ordnance Datum (OD). References to cartographic and documentary evidence and published sources will be given in brackets throughout the text, with full details listed in the sources section at the rear of the report.

1.5 Illustrations

1.5.1 Printed map extracts are not necessarily produced to their original scale.

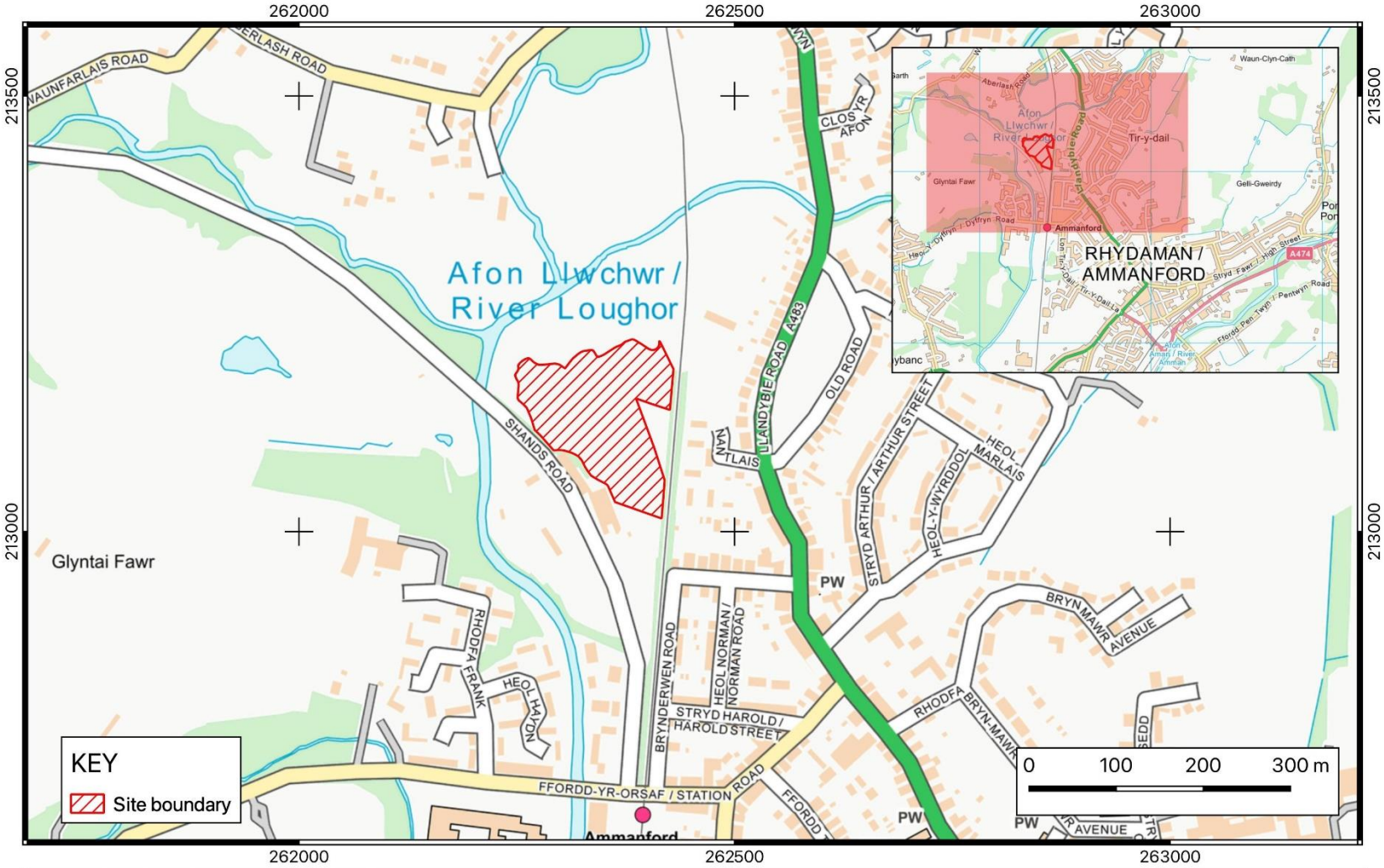
1.6 Timeline

1.6.1 The following timeline (Table 1) is used within this report to give date ranges for the various archaeological periods that may be mentioned within the text.

***Table 1**: Archaeological and Historical Timeline for Wales*

Period	Approximate date	
Palaeolithic –	*c*.450,000 – 10,000 BC	**Prehistoric**
Mesolithic –	*c*. 10,000 – 4400 BC	
Neolithic –	*c*.4400 – 2300 BC	
Bronze Age –	*c*.2300 – 700 BC	
Iron Age –	*c*.700 BC – AD 43	
Roman (Romano-British) Period –	AD 43 – *c.* AD 410	**Historic**
Post-Roman / Early Medieval Period –	*c*. AD 410 – AD 1086	
Medieval Period –	1086 – 1536	
Post-Medieval Period[1] –	1536 – 1750	
Industrial Period –	1750 – 1899	
Modern –	20th century onwards	

[1] The post-medieval and industrial periods are combined as the post-medieval period on the Regional Historic Environment Record as held by Dyfed Archaeological Trust



Proposed Flood Bund, Ammanford, Carmarthenshire
Source: OS Open Data Hub. Miniscale: A simple overviw map of the Great Britain. Credit OS,ONS.

DAT Archaeological Services

Figure 1: Site location

2. THE SITE

2.1 Site Location and Topography

2.1.1 The development site is situated on the floodplain of the Afon Loughor to the northwest of Ammanford town. The site is bordered by Afon Loughor to the north, the Heart of Wales railway line to the east and Shands road to the west. The development area is currently undeveloped pasture and common ground (Photo 1).

2.1.2 The British Geological Survey records the superficial deposits beneath the site as river terrace deposits – sand and gravel formed up to three million years ago in an environment dominated by rivers. The bedrock geology is recorded as sedimentary rock formed approximately 318 to 319 million years ago in swamps, estuaries and deltas.

Photograph 1: View of development area at time of survey

2.2 Archaeological Potential

2.2.1 A Historic Environment Desk-Based Assessment prepared by DAT Archaeological Services (Enright 2018) highlighted the potential for Bronze Age remains to survive within the development area.

2.2.2 The following extract from the desk-based assessment summaries the impact of the proposed flood defences:

Much of the proposed flood defence scheme lies within urbanised areas, dating from the mid-1800s onwards. This urbanisation has already directly impacted upon the landscape with the construction of buildings, car parks, services, landscaped gardens and even existing river defences. All of these previous developments could potentially have destroyed or damaged any surviving historical assets and has seriously changed the rural nature of the landscape that once existed.

The areas that are not currently built upon are likely to have been used over the years as nothing more than meadowland and pasture. They have probably always been prone to flooding and although some ground improvements and ploughing may have occurred, they are likely to have

remained relatively undisturbed due to this flood risk. These areas are where there is the greatest potential for encountering remains of burnt mounds.

3. METHODOLOGY

3.1 Data Collection

3.1.1 The geophysical survey was conducted by an experienced surveyor using a fluxgate gradiometer with two sensors at 1m spacing and with a DL601 data logger. The gradiometers sensitivity was set to detect a magnetic variation in the order of 0.1 nanoTesla.

3.2.2 Data was collected within a controlled grid that the surveyors physically marked out on the ground to within 0.1m+/- accuracy. The survey grid was tied into the local Ordnance Survey (OS) grid using a Trimble R8s integrated GNSS system with a TSC3 controller.

3.2 Ground Coverage

3.2.1 Geophysical methods rely on a contrast in the physical properties between the buried archaeological remains and the surrounding soil. Therefore, in order to best characterise archaeological features, it is often necessary to survey a large enough area that not only captures any possible targets but also incorporates a sufficient area of natural background response. Typically, the size of the survey area is constrained by external influences that can adversely impact the survey data (i.e. chain-linked fences, telegraph poles, modern field boundaries, etc). To minimise the affect these can have a distance of up to 5m from field boundaries is maintained, a greater distance may be required for larger modern ferrous objects such as pylons.

3.3 Resolution

3.3.2 Data was collected in 30m x 30m grids using the zigzag traverse method with a sample interval (x-axis) of 0.25m (four readings per metre) and a line separation (y-axis) of 1m.

3.4 Data Processing

3.4.1 The data was processed using *Terrasurveyor 3.0.36.1* and is presented with a minimum of processing.

3.4.2 Typically, the data is "de-striped" to remove any striping effect caused by an imbalance between the two sensors. It is then "clipped" to remove high values caused by ferrous objects, which tend to hide fine details and obscure archaeological features, allowing finer details to show through.

3.4.3 Other processing functions may include "de-staggering" the data. This is to correct line displacement errors caused by variations in the traversal rate resulting in the sensors being in the incorrect position when taking a reading. Finally, the data may be "interpolated" followed by a "low pass filter". The gradiometer collects readings every 0.25m along the transect (x-axis) and 1.0m (or 0.25m in the higher resolution surveys), this results in an imbalanced grid, so by interpolating the data and choosing to match the x and y-axis by an increased factor the grid becomes more balanced. The "low pass filter" is used cautiously to smooth the data without removing any archaeology.

3.5 Data Presentation and Interpretation

3.5.1 Data is presented with a minimum of processing as a grey-scale plot overlaid on local topographical features. The main magnetic anomalies have been identified using a combination of the grey-scale plots at different stages of processing and XY traces which aid in interpretation by allowing for visualisation of the magnitude and form of a geophysical anomaly.

3.5.2 The results have been compared to available sources (satellite imagery, aerial photographs, historic maps etc.) to increase confidence levels, and an interpretation of the results has been formulated. In some instances, it is possible to provide a very specific interpretation to geophysical anomalies, i.e. where its character or form is well documented, its existence was known about before the survey, or corroborative evidence can be found. In other cases, a broader categorisation of interpretation is required (outlined in Table 2). Often, looking at the results as a whole and the environs within which they sit provides greater context and aids in interpreting individual features.

Table 2: *Categories of interpretation for geophysical anomalies.*

Archaeological features	
Archaeology	Where the character and form of response are clearly archaeological in origin or corroborative evidence exists (i.e. historical sources, excavation, etc.). These are typically made up of linear/curvilinear/rectilinear anomalies. This category also includes pits with a discernible arrangement, grouping or association with an archaeological feature to suggest an archaeological origin.
Industrial/area of burning	Where an anomaly has a strong magnetic response that could be evidence of kilns, heaths etc, their shape, form and context may aid interpretation. Caution should be observed as often a similar response can be produced from modern ferrous material.
Possible archaeological feature	
Possible archaeology	Where an archaeological response is favoured, but the response is weak or incomplete and lacks any distinguishing characteristics akin to an archaeological feature. This category also includes possible pits with no discernible pattern, grouping or association with an archaeological feature. They may be of archaeological origin, but they are also likely to represent natural features such as a tree throws (former root bole of a tree shrub).
Area of enhanced magnetic activity	An area that exhibits increased magnetic variations with no discernible pattern or cause. This may have an archaeological origin or a result of the geological variation.
Agricultural features	
Former field boundary	Typically a linear anomaly often seen as a positive response (bank) flanked either side by a negative (response) ditches. These can usually be attributed to former boundaries depicted on historical maps.
Ridge and furrow	A series of regular linear anomalies with consistent broad spacing. If they run parallel with existing field boundaries this might suggest a recent activity.

Plough lines	A series of regular linear anomalies with consistent narrow spacing. If they run parallel with existing field boundaries this might suggest a recent activity.
Field drains	A series of regularly spaced linear anomalies.
Non-archaeological features	
Magnetic interference	Typically an external source that affects the survey data. Usually occurs along the edges of surveys near fences containing ferrous material or around pylons and from subsurface utilities.
Ferrous	These may be associated with an artefact of archaeological interest but generally unless they form a pattern or a part of a larger feature they are regarded as not significant. They are usually the result of miscellaneous modern ferrous-rich debris, such as brick and tile fragments, and objects such as horseshoes or broken ploughshares, which lie within the topsoil and result in a dipole response.
Natural / Geology	These natural variations can cause significant variations in magnetic readings.

4. RESULTS AND DISCUSSION

4.1 The geophysical survey results are presented as a grey-scale plot overlaid on a topographical map in Figure 2. The interpretation of the results is provided in Figure 3. In total, an area of 1.21ha was surveyed.

4.2 In general, the quality of the survey data was good with little interference from external sources except around the edges of the survey area where the survey has encroached near boundaries containing metal wiring.

4.3 *Archaeological Features*

4.3.1 No features of specified archaeological origin were identified during the survey.

4.4 *Possible Archaeological Features*

4.4.1 No features of possible archaeological origin were identified during the survey.

4.5 *Agricultural Feature*

4.5.1 No features with an agricultural origin were identified during the survey.

4.6 *Non-Archaeological features*

Magnetic interference

4.6.1 Evidence of magnetic interference typically occurs around the perimeter of the survey area where it has encroached to close to field boundaries that contain ferrous materials. This is particularly evident along the western edge of the survey area.

4.6.2 To the north of the centre of the survey area a large area of magnetic interference has been observed. The location of this corresponds to a manhole cover.

Ferrous (Point)

4.6.3 Discrete dipole anomalies can be seen throughout the survey area and are likely caused by modern ferrous material located within the topsoil.

Natural (Discrete)

4.6.4 These discrete anomalies are commonly seen throughout surveys and often, without sufficient evidence, it is difficult to attribute such features with an archaeological origin and they are often regarded as likely representing natural or geological features. They are likely to be the result of a natural phenomenon such as infilled tree throws (former root bole of a tree shrub). If these are not natural then individual pits could be a possible explanation, but without greater context such as a discernible arrangement, grouping or relation to a larger archaeological feature this seems unlikely. Only a subset of these features has been plotted.

Natural (Linear)

4.6.5 Located in the northeast corner of the survey area four faint linear anomalies were recorded. One of these linears (1) correlates to a commonly used footpath but the remaining three have no obvious cause. The response along each linear is diffused and weak. They likely represent the routes of other former footpaths.

5. SUMMARY OF RESULTS

5.1 Generally, the quality of the survey data was good; there was limited magnetic variation across the survey and little or no interference from external sources which could have adversely affected the survey data.

5.1 The geophysical survey has provided no evidence of potential buried archaeology. The results suggest that the proposed flood defences are unlikely to impact on any significant buried archaeological features or deposits.

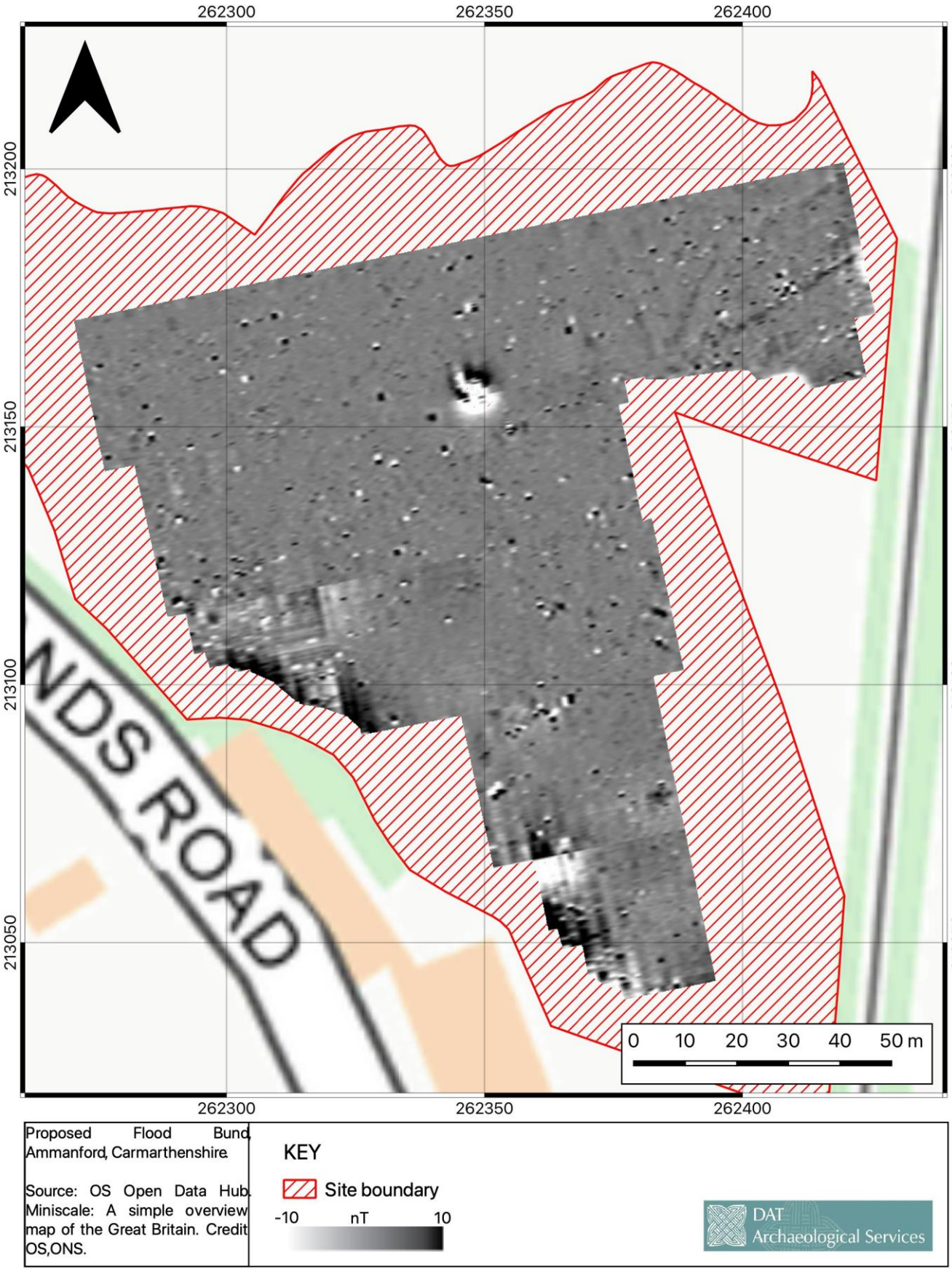


Figure 2: Grey-scale plot of geophysical survey results.

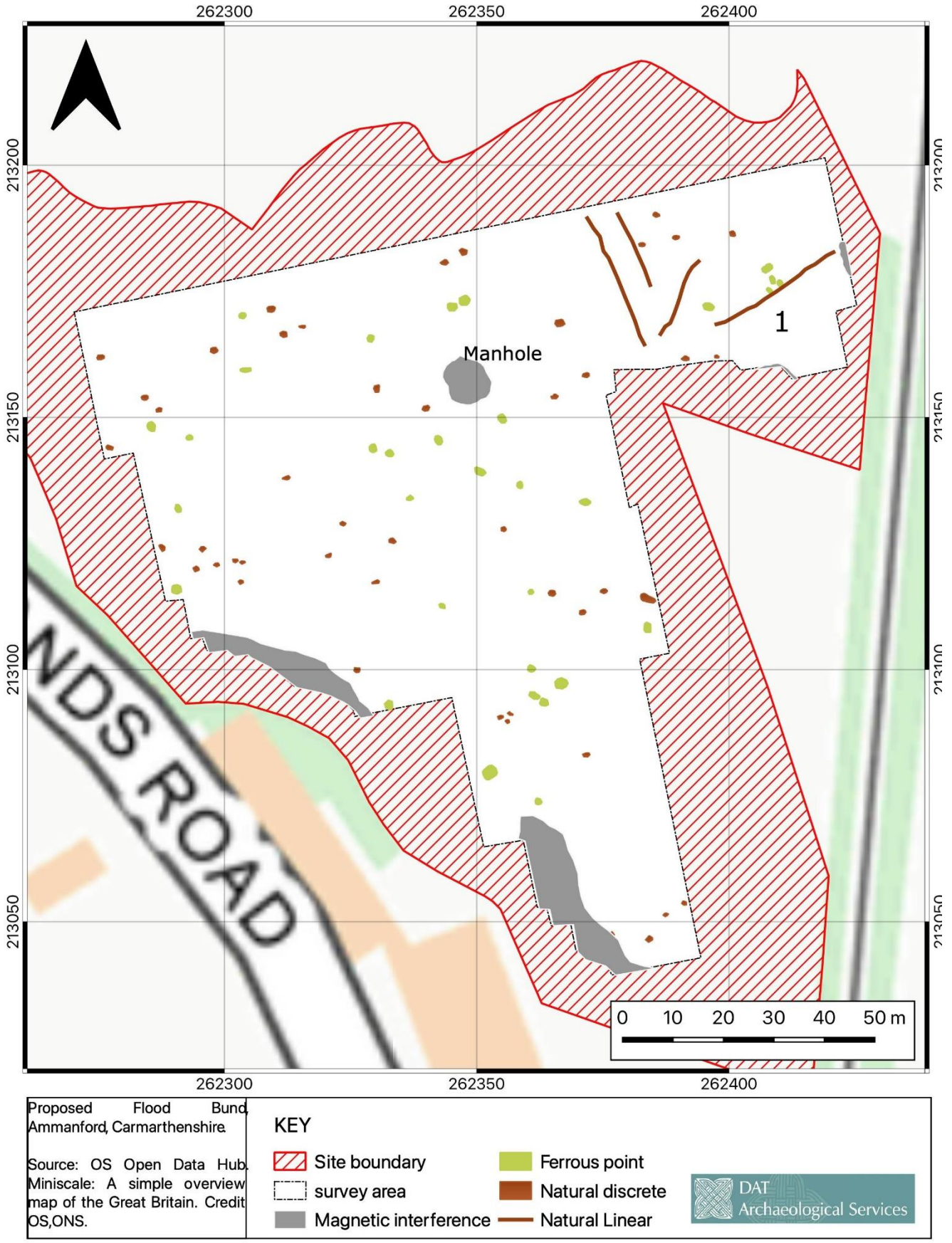


Figure 3: Interpretation plot of geophysical survey results.

6. SOURCES

Published

CIfA, 2014 *Chartered Institute of Field Archaeologists Standards and Guidance for Archaeological Geophysical Survey*

Enright, C, 2018 *Flood Risk Defences, Ammanford, Carmarthenshire: Historic Environment Desk-Based Assessment*, DAT Unpublished Report No 2018/56

National Standard and Guidance for Collecting and Depositing Archaeological Archives in Wales 2017. http://www.welshmuseumsfederation.org/en/news-archive/resources-landing/Collections/national-standard-and-guidance-for-collecting-and-depositing-archaeological-archives-in-wales-2017.html

Online resources

British Geological Survey [online] Date Accessed 14th February, 2020.http://mapapps.bgs.ac.uk/geologyofbritain/home.html.

APPENDIX I:

PROPOSED FLOOD BUND, AMMANFORD, CARMARTHENSHIRE: GEOPHYSICAL SURVEY WRITTEN SPECIFICATION

1. INTRODUCTION

1.1 DAT Archaeological Services have been commissioned by Ove Arup & Partners Ltd to prepare a written scheme of investigation (WSI) for a programme of geophysical survey on land near Ammanford, Carmarthenshire proposed for the construction of a new flood bund, centred on NGR SN 6234 1313 (Figure 1). The site covers an area measuring approximately 1.8 hectares and is situated on the floodplain of the Afon Loughor to the northwest of Ammanford town. It is bordered by the Afon Loughor to the north, a railway line to the east and a minor road to the west.

1.2 Following discussions with the archaeological advisor to Carmarthenshire Planning Authority, Dyfed Archaeological Trust–Development Management (DAT-DM) it is understood that a geophysical survey has been recommended prior to works commencing.

1.3 The results of the survey will be used to inform subsequent design considerations of the proposed development so that they can aim to avoid impacts upon any archaeological remains or that further archaeological mitigation can be implemented before such remains are disturbed.

1.4 Information has been supplied by the client that most of the development area is reasonably level, currently laid to grass, frequently mown and free of large metal objects (Photo 1).

1.5 This written scheme of investigation outlines the methodology through which DAT Archaeological Services will undertake a geophysical survey within the area proposed for development.

1.6 This document has been prepared for the client and is specifically prepared for DAT Archaeological Services to undertake the required archaeological works. The WSI cannot be used by any third party.

1.7 The written scheme of investigation is in accordance with the *Standard and Guidance* for archaeological geophysical survey (Chartered Institute for Archaeologists (CIfA 2014).

1.8 DAT Archaeological Services has considerable experience of this type of project and always operates to best professional practice. DAT Archaeological Services is the contractual arm of Dyfed Archaeological Trust that has its own Health and Safety Policy, and all works are covered by appropriate Employer's Liability and Public Liability Insurances. Copies of all are available on request.

1.9 Dyfed Archaeological Trust is a ***CIfA Registered Organisation*** and all permanent staff are CSCS registered.

2. PREVIOUS WORK

2.1 The development area has been subjected to a desk-based assessment (Enright 2018[2]) whose conclusions were summarised as:
In the rural flood plains of the proposed risk defences the potential for Roman remains is considered low. If such remains were found their archaeological importance would be high.

The potential for Bronze Age remains within the development area is considered moderate, given the proximity of known burnt mounds and round barrows. Further sites identified from this period during the development would be considered of high archaeological importance.

The potential of finding significant (and non-agricultural) remains in the development area from the Early Medieval, post-medieval or modern periods is low. Any buried remains encountered during the development from these periods would be of low to medium importance depending on the rarity of the site types.

A geophysical survey prior to development within open land areas could be useful for identifying possible buried archaeological features, particularly burnt mounds which may exhibit a strong thermoremanent magnetisation, detectable to a magnetic survey.

The information gained from a geophysical survey could be used to inform any decision on further archaeological mitigation.

3 AIMS AND OBJECTIVES OF THE PROJECT

3.1 This document provides a scheme of works for:
The implementation of geophysical survey within an area proposed for development of a new flood bund to the northwest of Ammanford, Carmarthenshire. A report and archive of the results will be prepared.

3.2 The following tasks will be completed:

- Provision of a WSI to outline the methodology for the geophysical survey which DAT Archaeological Services will undertake (this document);
- To identify the presence/absence of any potential archaeological deposits through gradiometer survey,
- To produce an archive and report of any results.

[2] ***Enright, C, 2018*** **Flood Risk Defences, Ammanford, Carmarthenshire: Historic Environment Desk-Based Assessment,** ***DAT Unpublished Report No 2018/56***

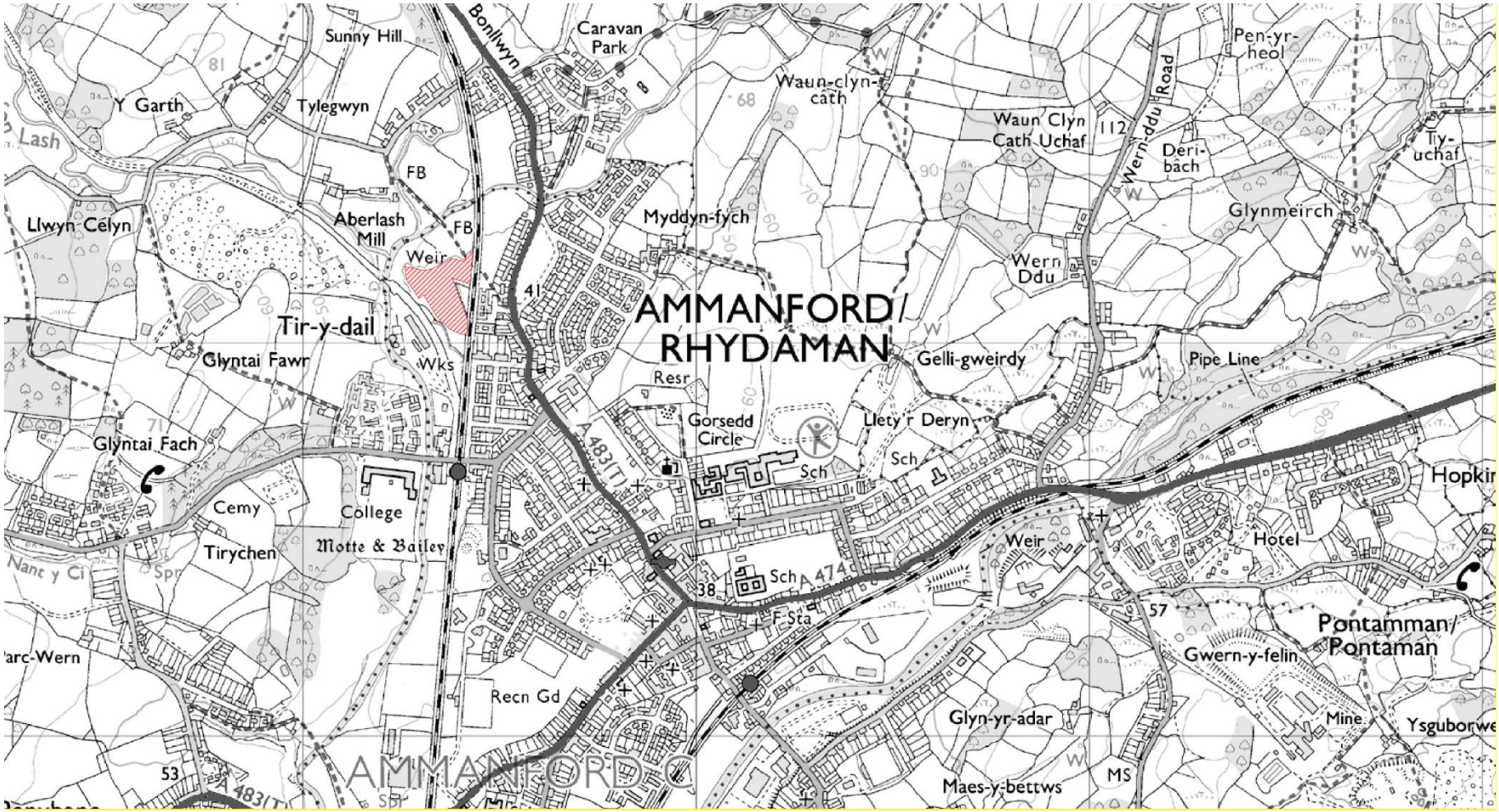


Figure 1: Location map showing the area proposed for geophysical survey (shaded in red).

Photo 1: View across area proposed for flood bund (©DAT 2018)

4 GEOPHYSICAL SURVEY METHODOLOGY

4.1 The results of the geophysical survey should provide further information of the archaeological potential of the site through the identification of subsurface features which could be indicative of archaeology. The aim of the survey is to assess, characterise and locate surviving below ground archaeology.

4.2 The survey will be carried out using a Bartington Grad601-2 dual Fluxgate Gradiometer, which uses a pair of Grad-01-100 sensors. These are high stability fluxgate gradient sensors with a 1.0m separation between the sensing elements, giving a strong response to deeper anomalies.

4.3 The instrument detects variations in the earth's magnetic field caused by the presence of iron in the sub-surface material. This is usually in the form of weakly magnetised iron oxides, which tend to be concentrated in the topsoil. Features cut into the subsoil and backfilled or silted with topsoil therefore contain greater amounts of iron and can therefore be detected with the gradiometer. There are also other processes and materials that can produce detectable anomalies. The most obvious is the presence of pieces of iron in the soil or immediate environs, which usually produce very high readings. Features such as hearths or kilns also produce strong readings because fired clay acquires a permanent thermo-remnant magnetic field upon cooling.

4.4 The Bartington Grad601 is a hand-held instrument and readings are taken automatically as the operator walks at a constant speed along a series of fixed length traverses. The sensor consists of two vertically aligned fluxgates set 1.0m apart. Their Mumetal cores are driven in and out of magnetic saturation by an alternating current passing through two opposing driver coils. As the cores come out of saturation, the external magnetic field can enter them producing an electrical pulse proportional to the field strength in a sensor coil. The high frequency of the detection cycle produces what is in effect a continuous output (Clark 1996).

4.5 The gradiometer can detect anomalies down to a depth of approximately one metre. The magnetic variations are measured in nanoTeslas (nT). The earth's magnetic field strength is about 48,000 nT; typical archaeological features produce readings of below 15nT although burnt features and iron objects can result in changes of several hundred nT. The instrument is capable of detecting changes as low as 0.1nT.

4.6 The gradiometer includes an on-board data-logger. Readings in the surveys will be taken along parallel traverses of one axis of a grid made up of 30m x 30m squares. The traverse intervals will be set 0.5m apart. Readings are logged at intervals of 0.25m along each traverse giving 3200 readings per grid square (medium resolution on 0.5m traverses),

4.7 A Trimble GPS will be used to set out the survey grid and to tie the survey grid into the local Ordnance Survey grid. The grid will be marked out with the use of temporary bamboo canes and small plastic pegs. All markers will be removed from site once the surveys are complete.

4.8 Processing will be performed using *TerraSurveyor 3.0*. The data will be presented with a minimum of processing. The presence of high values caused by ferrous objects, which tend to hide fine details and obscure archaeological features, will be 'clipped' to remove the extreme values allowing the finer details to show through.

4.9 The processed data will be presented as grey-scale plots overlaid on local topographical features. Raw data and trace plots (x-y) will also be provided. The main magnetic anomalies will be identified and plotted onto the local topographical features as a level of interpretation.

4.10 The resulting survey results and interpretation diagrams should not be seen as a definitive model of what lies beneath the ground surface, not all buried features will provide a magnetic response that can be identified by the gradiometer. In interpreting those features that are recorded the shape is the principal diagnostic tool, along with comparison with known features from other surveys. The intensity of the magnetic response could provide further information, a strong response for example indicates burning, high ferric content or thermoremnancy in geology. The context may provide further clues but the interpretation of many of these features is still largely subjective.

4.11 All measurements given will be approximate as accurate measurements are difficult to determine from fluxgate gradiometer surveys. The width and length of identified features can be affected by its relative depth and magnetic strength.

4.12 The interpretation diagrams will be used to identify the presence/absence of any potential archaeological deposits and features, and will help decide whether further archaeological mitigation is necessary in this area, following discussions with the archaeological advisor to the planning authority.

5 POST-FIELDWORK REPORTING AND ARCHIVING

5.1 An archive will be prepared if it meets the requirements of the Dyfed Archaeological Trust archive retention policy (2018). If it does, then data recovered during the evaluation will be collated into a site archive structured in accordance with the specifications in Archaeological Archives: a guide to best practice in creation, compilation, transfer and curation (Brown 2011), and the procedures recommended by the National Monuments Record, Aberystwyth. The National Standards for Wales for Collecting and Depositing Archaeological Archives produced by the Federation of Museums and Art Galleries of Wales will also be adhered to. Digital archives will be collated using the Royal Commission on the Ancient and Historical Monuments of Wales systems (2015) and deposited with the RCAHMW. The Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs) shall be followed.

5.2 The results of the fieldwork will be assessed in local, regional and wider contexts.

5.3 The results will be used to inform subsequent design considerations of the proposed development so that they can aim to avoid impacts upon any archaeological remains or that further archaeological mitigation can be implemented before such remains are disturbed.

5.4 A summary of the project results, excluding any confidential information, may be prepared for wider dissemination (e.g. Archaeology in Wales and special interest and period-specific journals).

5.5 The report will be prepared to follow the Standard and Guidance for Archaeological Geophysical Survey (CIfA S&G: AWB 2014).

5.6 Digital copies of the report will be provided to the client, as well as the Dyfed Archaeological Trust - Development Management.

6 STAFF

6.1 The project will be managed by Fran Murphy MCIfA.

6.2 The on-site works will be undertaken by experienced archaeologists, from DAT Archaeological Services.

7 QUALITY ASSURANCE

7.1 DAT Archaeological Services has considerable experience of undertaking all categories of archaeological fieldwork and always operates to best professional practice; adhering to CIfA guidelines where appropriate. The Trust is a Registered Organisation with CIfA and all staff abide by their code of conduct and adhere to their relevant standards and guidance.

7.2 DAT Archaeological Services operate robust internal monitoring procedures that ensure that the standard of each project is maintained from commencement to completion.

8 MONITORING

8.1 The fieldwork may require monitoring by the archaeological advisor to the planning authority, Dyfed Archaeological Trust – Development Management, who should be told of the commencement of the works. The fieldwork may also need to be monitored by the Head of DAT Archaeological Services.

8.2 All parties should be provided with free access to the site at any time during the geophysical survey.

9 HEALTH AND SAFETY

9.1 All permanent DAT Archaeological Services staff are CSCS[3] registered.

9.2 Service information should be obtained prior to the start of the works.

9.3 A health and safety risk assessment must be prepared prior to the works commencing to ensure that all potential risks are minimised.

[3] ***Construction Skills Certification Scheme (Health and Safety Tested)***

9.4 All site inductions, H&S procedures, H&S constraints and site rules of the client or any on-site contractor will be made known to the archaeological contractor at the start of the works.

9.5 All relevant health and safety regulations must be followed, including compliance with Welsh Government guidelines on working practices during the current Covid-19 Pandemic, and guidance issued by CIfA.

9.6 CIfA advise that Registered Organisations should ensure they are familiar with the latest *Site Operating Procedures*, published by the Construction Leadership Council (Version 4, updated 18th May 2020) and the latest *Covid-19 Working Advice Ver.1.1*, published by Prospect (5th May 2020), which addresses potential issues relating to archaeological site work. These procedures will be attached to the project risk assessment. If the site cannot operate in line with this guidance then the project archaeologist will not be allowed to attend.

9.7 The project risk assessment details the precautions put in place to reduce the spread of Covid-19 Coronavirus during fieldwork.

9.8 Safety helmets, safety boots and high visibility vests are to be used by all site personnel as necessary. The site contractors will make all archaeological staff aware of any additional PPE that may be required and provide it. Archaeological staff must not enter any area where there is a considered to be a health and safety risk that has not or is not being appropriately mitigated against.

9.9 DAT Archaeological Services staff must ensure that their presence on site is communicated to all relevant site staff, especially machine operators.

10 ARBITRATION

10.1 Any dispute or disagreement arising out of a contract in relation to this work shall be referred for a decision to the Chartered Institute of Archaeologist's arbitration scheme.

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