MANORBIER COMMUNITY HUB, MANOBIER, PEMBROKESHIRE: GEOPHYSICAL SURVEY

DAT Archaeological Services

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MANORBIER COMMUNITY HUB, MANORBIER, PEMBROKESHIRE: GEOPHYSICAL SURVEY

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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 development.

The geophysical survey recorded several features within the development area; some of which could represent surviving evidence for prehistoric activity.

CRYNODEB GWEITHREDOL

Comisiynwyd Gwasanaethau Archeolegol YAD i gynnal arolwg geoffisegol ar dir ger Ffordd Hounsell, Maenorbŷr, Sir Benfro; tir arfaethedig ar gyfer codi adeilad Hwb Cymunedol newydd.

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

Cofnododd yr arolwg geoffisegol sawl nodwedd yn yr ardal ddatblygu; gallai rhai ohonynt gynrychioli tystiolaeth sydd wedi goroesi ar gyfer gweithgaredd cynhanesyddol.

MANORBIER COMMUNITY HUB, MANORBIER, PEMBROKESHIRE: GEOPHYSICAL SURVEY

SUMMARY

DAT Archaeological Services were commissioned by Archaeology Collective Ltd to undertake a geophysical survey in an area proposed for the construction of a new Community Hub building with associated access, parking, and recreation area. The site is located on land adjacent to Hounsell Road, Manorbier, Pembrokeshire (centred on NGR SS 07426 97902).

The proposed development area lies within a landscape considered rich in archaeology. Approximately 1.5km to the southwest of the development area lies the scheduled monument of the King's Quoit which is a fine example of a well preserved Neolithic chambered tomb (Scheduled Monument PE035, PRN4213). To the northeast, at a distance of 2.6km, the Bier Hill Bronze Age barrow cemetery (Scheduled Monument PE470, PRN47443) is located. Later prehistory is also demonstrated in the area with the presence of the Iron Age promontory fort of Old Castle Head 1.2km to the south (Scheduled Monument PE405, PRN4223). A second Iron Age promontory fort, Skomar Camp, (Scheduled Monument PE545, PRN4210) lies 1.1km to the east. The later medieval Castle of Manorbier is sited just less than 1km to the west (Scheduled Monument PE004, PRN4221) at the southwestern end of the village. Also, within close vicinity of the development area are a series of records that relate to RAF Manorbier, a radar station constructed during the Second World War.

Thus, the potential for buried archaeological remains to survive within the development area of prehistoric or later date was considered high. Therefore a geophysical survey was recommended to provide a better indication of the archaeological potential of the site and if required, enable targeting of any further archaeological mitigation before or during the development.

In total, an area measuring 1.4ha was surveyed. The geophysical survey recorded a sub-circular anomaly and a series of several pit like anomalies all of which could represent archaeological features of prehistoric date. The single sub-circular feature, due to its size and form, suggests it could be the remains of a prehistoric ring ditch that may have surrounded a burial.

Intrusive investigation would be needed to determine the origin and significance of these anomalies.

1. INTRODUCTION

1.1 Project Commission

1.1.1 DAT Archaeological Services were commissioned by Archaeology Collective Ltd to undertake a geophysical survey within an area proposed for residential development, centred on NGR SS 07426 97902 (Figure 1).

1.1.2 The development proposals comprise the construction of a new community hub building with associated access, parking and a recreation area to the south on land adjacent to Hounsell Road, Manorbier, Pembrokeshire.

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. The purpose of the geophysical survey was to provide a better indication of the archaeological potential of the site through the identification of subsurface features which could be indicative of archaeology. This 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). Scheduled Monument (SM). 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.

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	

Table 1: Archaeological and Historical Timeline for Wales

[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

Figure 1: Site location

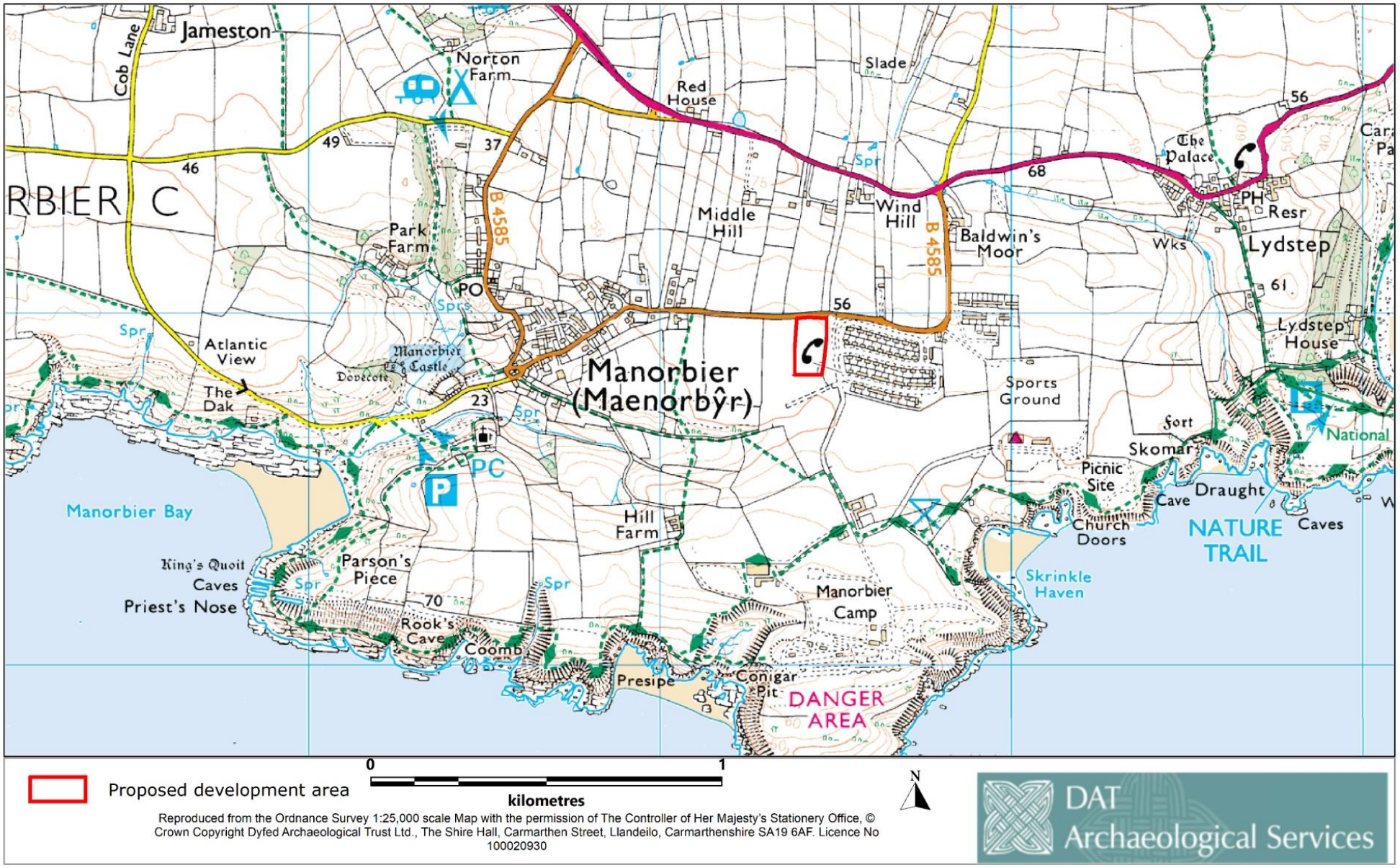

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Figure 2: Proposed development area (outlined in red)

2. THE SITE

2.1 Site Location and Topography

2.1.1 The proposed development area lies just within the western outskirts of the village of Manorbier on the coastal fringe of south Pembrokeshire (Figure 2). The development area is currently undeveloped pasture land which has been used as arable land in the recent past (Photos 1 and 2).

2.1.2 The British Geological Survey records the bedrock beneath the majority of the site as the Pembroke limestone group – formed approximately 329 to 359 million years ago in the Carboniferous Period when the local environment was previously dominated by shallow carbonate seas. At the far southern end of the development area a limestone of similar age but described as a Black Rock Subgroup and Gully Oolite Formation is recorded (BGS online).

Photo 1: View south from the northern entrance of the field across the proposed development area.

Photo 2: View of overgrown area within the southeast corner of the proposed development area.

2.2 Archaeological Potential

2.2.1 The development area lies near several scheduled monuments and other sites dating from the prehistoric periods through to World War 2.

2.2.2 The earliest example of human activity found within proximity to the proposed development comprises a Mesolithic flint working site (PRN4208) found at Hill Farm which is situated approximately 1km to the southwest. The flint assemblage included many flint cores, scrapers and thin blades, all of which were considered to be Mesolithic in date.

2.2.3 Archaeology dating to the Neolithic period is represented by the well-preserved Kings Quoit Chambered Tomb (PRN4213), which is situated 1.5km to the southwest of the proposed development. The Kings Quoit Chambered Tomb is a Scheduled Monument (PE035).

2.2.4 A Bronze Age round barrow cemetery at Bier Hill is located 2.6km to the northeast of the proposed development (PRN47443). The Bier Hill complex comprises five individual mounds arranged in an east-west linear fashion along the line of the Ridge Way. This group is a designated Scheduled Monument (PE470).

2.2.5 Two scheduled Iron Age promontory forts are also found within proximity to the proposed development. These are Old Castle Head (PE405) positioned 1.2km to the south and Skomar Camp (PE545) located around 1.1km to the east.

2.2.6 The medieval castle of Manorbier (PE004) lies less than 1km to the west of the proposed development and is located at the southwestern end of the modern village. The castle was first established by the Normans and is first mentioned in 1146 as being under the ownership of the de Barrys family who were a Norman family who took their name from Barry in south Wales. Due to the natural defensive setting of the castle it has been

suggested that the site would have been an ideal position for an Iron Age fort.

2.2.7 The Grade I listed parish church of St James (LB Ref 5975, PRN4219) in the village dates from the 12th century, and a remnant of the medieval pattern of strip fields still survives to the north of the village, just north of the development area.

2.2.8 During the Second World War RAF Manorbier was established; formed to guard against enemy aircraft and also plot shipping passing through the Bristol Channel. Although little survives above ground of the camp it once covered a large area, in close vicinity to the proposed development area. Several surviving buildings positioned approximately 1.2km to the south are scheduled (PE493).

3. METHODOLOGY

3.1 A fluxgate gradiometer with a DL601 data logger was used to conduct the detailed geophysical survey, which detects variations in the earth's magnetic field. A sample interval of 0.25m (four readings per metre) was used with 0.5m wide traverses across 20m x 20m grids using the zigzag traverse method of collecting data. The gradiometers sensitivity was set to detect a magnetic variation in the order of 0.1 nanoTesla.

3.2 The survey grid was tied into the local Ordnance Survey grid using a Trimble R8s integrated GNSS with TSC3 controller.

3.3 The data was processed using *Terrasurveyor 3.0.35.10* and is 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, have been 'clipped' to remove the extreme values allowing the finer details to show through.

3.4 The processed data has been presented as a grey-scale plot, overlaid on local topographical features. The main magnetic anomalies have been identified and an interpretation of those results is also given where appropriate.

3.5 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 a 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.

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

3.7 As much of the development area as possible was subjected to geophysical survey. The overgrown hedge boundaries that extended into the development area and the overgrown area in the southeastern part of the site as shown in Photo 2 substantially reduced the area accessible for survey; as shown in Figures 3 and 4.

4. RESULTS

4.1 The geophysical survey results are presented as a greyscale plot in Figure 3. In total, an area of 1.4ha was surveyed.

4.2 A general trend of north-south lineations across the survey area has probably been caused by agricultural ploughing over many years.

4.3 Figure 4 shows an interpretation of the survey results, which are discussed by category below:

Ferrous material (Dipoles)

4.4 In geophysical greyscale plots, dipole anomalies are commonly seen across a range of sites, particularly agricultural land. Generally, unless they form a pattern or part of a larger feature they are not thought to be archaeologically significant. They are usually the result of miscellaneous modern ferrous rich debris, such as brick and tile fragments as well as objects such as horseshoes or broken ploughshares, which lie within the topsoil. In rare instances, isolated dipoles may reflect features of archaeological interest, but only further intrusive investigation can verify this.

Magnetic interference

4.5 Magnetic disturbance can occur where the survey encroaches near a field boundary, such as wire-fencing, that contains a ferrous material. In this instance, where the disturbance has occurred a single polarity response has been exhibited. This is particularly evident along the northern boundary of the field. However, the interference is minimal and has not impacted adversely upon the rest of the survey.

Pits

4.6 Evidence for pits is often seen distributed throughout survey areas. Some of these might have an archaeological origin but it is also likely that they could represent a natural feature such as a tree throw (former root bole of a tree shrub). Unless any discernible arrangement or grouping is apparent it is difficult to determine their origin.

Archaeological Features

4.7 (1) Circular ditch – A circular anomaly was recorded within the northern area of the survey and is thought to represent the remains of an excavated circular ditch. The ditch is less clear on its southern side. The feature measures roughly 14.7m in diameter and the ditch has an average width of 2.1m. Within the ditch itself two well-defined magnetic anomalies were recorded; one to the southwest and another in a similar position to the southeast. These pits are very distinctive and their position relative to the ditch and high magnetic readings suggest that they could be evidence of cremation burials.

4.8 (2) Linear ditches – Aligned roughly east to west across the survey area are three, closely spaced linear anomalies which are thought to represent the remains of a series of linear ditches; the remnants of former agricultural field boundaries. Historic mapping (Figure 5) depicts a field boundary in a similar position. Typically all three anomalies measured 0.7m wide.

4.9 (3) Linear ditch – The remains of a strong linear anomaly was recorded running east-west across the centre of the survey area, to the south of linear features (2). This linear ditch had an average width of 1.5m, and although lying somewhat parallel with (2) it may possibly have earlier origins.

4.10 (6) Pit group - The remains of four separate very strong anomalies recorded during the survey at the southern end of the survey area could be a group of pits that may be archaeologically significant.

Natural feature?

4.11 (4) Irregular shaped linear – The remains of an irregular shaped linear feature were recorded to the south of feature (3). This feature had a strong magnetic reading but it is not known with certainty whether the feature is archaeological or geological in origin. The feature runs somewhat parallel with ditch (3) and this lends weight to the possibility that it might be archaeological in origin.

Modern service

4.12 (5) Modern service – The remains of a modern service trench were recorded running on a northwest-southeast alignment. It contains two strong anomalies situated along its course which are considered to be the positions of probable inspection chambers. The service trench had an average width of 1m.

Figure 3: Geophysical survey greyscale plot.

Figure 4: Geophysical survey interpretation

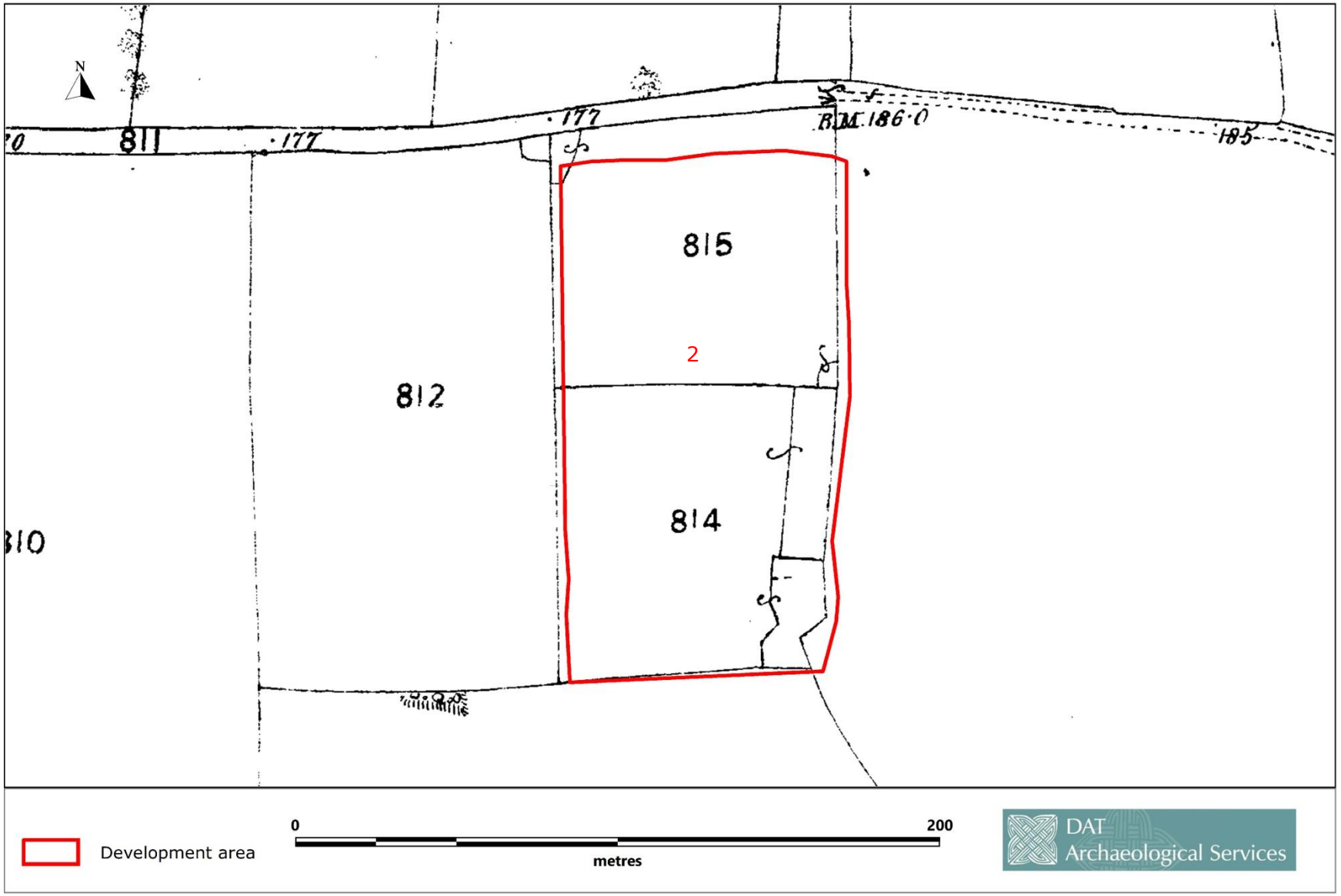

Figure 5: 1st edition Ordnance Survey 25" map of 1905 depicting development area and field boundary running east-west across the middle of the survey area, recorded in results as feature (2).

5. CONCLUSIONS

5.1 Generally the quality of the survey data was good; with little interference from external influences.

5.2 The sub-circular anomaly (1) appears likely to represent the remains of a ring ditch enclosure. This type of feature typically dates widely across prehistory and is often associated with ritual and funerary processes rather than evidence for domestic settlement. Although there is no evidence for a central burial within the ring ditch; this may have been destroyed by ploughing. Examples of later burials placed within the ditches of similar ditched enclosures are recorded, such as at Plas Gogerddan, Ceredigion (Murphy 1992), and the two magnetic anomalies recorded within this circular ditch may be evidence for later cremation burials.

5.3 The series of linear anomalies (2) recorded running east-west across the centre of the survey area are considered to be the remains of former ditches associated with field boundaries and/or a trackway. A field boundary in the same position is shown on historic mapping. The boundary has been removed in recent times to create a larger field.

5.4 Linear anomaly (3) represents the remains of a ditch located to the south and somewhat parallel with feature (2). This anomaly produced a very strong clear magnetic reading which would suggest that this ditch has been excavated some depth into the natural bedrock.

5.5 Anomaly (4) produced a strong magnetic reading but its size and form are not easily interpreted as an archaeological feature and it may be geological in origin.

5.6 A cluster of 4 small anomalies (6) recorded at the southern end of the survey area provided very strong magnetic readings, and possibly represent the remains of pits, that could be archaeologically significant. One of the pits has a very high magnetic reading within its centre. This could be evidence of intense burning from, for example, a hearth or small furnace.

5.7 The results of the geophysical survey suggest there is some potential for archaeological features of prehistoric and post-medieval date to survive within the development area.

5.8 Further intrusive archaeological investigation, in the form of trial trench excavation or full excavation, would be needed to determine the date, character, and significance of the features recorded by the geophysical survey.

6. SOURCES

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Online resources

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7. GLOSSARY

Fluxgate Gradiometer	An instrument used to measure magnetism to search for areas of disturbed ground that may be associated with subsurface archaeological features.
nanoTesla (nT)	A unit of measurement of a magnetic field.
Ferrous object	Metals and alloys that contain iron.
Dipole	An anomaly consisting of a single positive response with an associated negative response forming a 'halo effect'. The negative and positive response is of equal magnitude but opposite polarity and are caused by the same feature. Dipole anomalies are very commonly observed across a range of sites, particularly agricultural land. Generally, unless the dipoles form part of a larger pattern or feature they are regarded as not significant. They are usually the result of modern ferrous rich debris such as brick and tile fragments as well as objects such as horseshoes or broken ploughshares, which lie within the topsoil.

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