

CADW PROJECT DAT 122 POSSIBLE ROMAN FORT, WISTON PEMBROKESHIRE: GEOPHYSICAL SURVEY 2012



Prepared by Dyfed Archaeological Trust
For CADW



ymddiriedolaeth archaeolegol

DYFED
archaeological trust

DYFED ARCHAEOLOGICAL TRUST

RHIF YR ADRODDIAD / REPORT NO. 2013/19
RHIF Y PROSIECT / PROJECT RECORD NO. 105423

CHWEFROR 2013
FEBRUARY 2013

CADW PROJECT DAT 122 POSSIBLE ROMAN FORT, WISTON, PEMBROKESHIRE: GEOPHYSICAL SURVEY 2012

Gan / By

Philip Poucher

Paratowyd yr adroddiad yma at ddefnydd y cwsmer yn unig. Ni dderbynnir cyfrifoldeb gan Ymddiriedolaeth Archaeolegol Dyfed Cyf am ei ddefnyddio gan unrhyw berson na phersonau eraill a fydd yn ei ddarllen neu ddibynnu ar y gwybodaeth y mae'n ei gynnwys

The report has been prepared for the specific use of the client. Dyfed Archaeological Trust Limited can accept no responsibility for its use by any other person or persons who may read it or rely on the information it contains.



Llywodraeth Cynulliad Cymru
Welsh Assembly Government

Ymddiriedolaeth Archaeolegol Dyfed Cyf
Neuadd y Sir, Stryd Caerfyrddin, Llandeilo, Sir
Gaerfyrddin SA19 6AF
Ffon: Ymholiadau Cyffredinol 01558 823121
Adran Rheoli Treftadaeth 01558 823131
Ffacs: 01558 823133
Epost: info@dyfedarchaeology.org.uk
Gwefan: www.archaeolegdyfed.org.uk

Dyfed Archaeological Trust Limited
The Shire Hall, Carmarthen Street, Llandeilo,
Carmarthenshire SA19 6AF
Tel: General Enquiries 01558 823121
Heritage Management Section 01558 823131
Fax: 01558 823133
Email: info@dyfedarchaeology.org.uk
Website: www.dyfedarchaeology.org.uk

Cwmni cyfyngedig (1198990) ynghyd ag elusen gofrestredig (504616) yw'r Ymddiriedolaeth.
The Trust is both a Limited Company (No. 1198990) and a Registered Charity (No. 504616)
CADEIRYDD CHAIRMAN: C R MUSSON MBE B Arch FSA MIFA.
CYFARWYDDWR DIRECTOR: K MURPHY BA MIFA

**POSSIBLE ROMAN FORT, WISTON, PEMBROKESHIRE:
GEOPHYSICAL SURVEY 2012**

CONTENTS	PAGE
SUMMARY	1
INTRODUCTION	2
Project Commission	2
Scope of the Project	2
Report Outline	2
Abbreviations	2
Timeline	3
THE SITE	4
Location and archaeological potential	4
METHODOLOGY	5
Limitations	5
Processing, presentation and interpretation	5
RESULTS	6
Geophysical interpretation	6
CONCLUSION	11
ACKNOWLEDGEMENTS	13
ARCHIVE DEPOSITION	13
SOURCES	13
APPENDIX 1 – METHODOLOGY AND INSTRUMENTATION	28
FIGURES	
Figure 1: Location map	14
Figure 2: Extract from the 1 st edition 1:2500 Ordnance Survey map of 1889	15
Figure 3: Geophysical survey results as greyscale plot	16
Figure 4: Geophysical survey results as red to blue plot	17
Figure 5: Geophysical survey results overlaid on topographical detail	18
Figure 6: Interpretation layer of geophysical survey results	19
Figure 7: Highlighted defensive ditches on interpretation layer	20
Figure 8: Highlighted possible entranceways on interpretation layer	20
Figure 9: Highlighted possible Principia on interpretation layer	21
Figure 10: Highlighted internal features on interpretation layer	21
Figure 11: Highlighted external features on interpretation layer	22
Figure 12: Highlighted later enclosure on interpretation layer	22

Figure 13:	Highlighted later roads and tracks on interpretation layer	23
Figure 14:	Lidar image of the site	27
Table 1:	Archaeological and historical timeline	3

PHOTOS

Photo 1:	Aerial photograph of the site taken 1955	24
Photo 2:	Aerial photograph of site taken in 1986 looking south	24
Photo 3:	Aerial photograph showing cropmarks south of site	25
Photo 4:	Aerial photograph showing Wiston	25
Photo 5:	Recent RCAHMW aerial photograph of the site	26
Photo 6:	Recent RCAHMW aerial photograph of the site	26
Photo 7:	Photograph looking SE across the site	27

POSSIBLE ROMAN FORT, WISTON, PEMBROKESHIRE: GEOPHYSICAL SURVEY 2012

SUMMARY

A possible Roman Fort has previously been suggested at this site (SN 026 187), near Wiston in Pembrokeshire, due to the presence of a large U-shaped ditch or hollow approximately 35m wide and 140m long with two perpendicular arms, and its location close to the remains of a Roman Road. The wide nature of the ditch/hollow, the fact that the site is labelled 'Old Quarry' on the Ordnance Survey maps and the shape of the site meant that the Roman fort interpretation has been dismissed in the past. However, recent Lidar data shows the arms of the ditch continuing further to the west than is shown on maps and aerial photographs, and that they may turn to form a rectangular enclosure with a possible entrance on the south side facing the Roman road.

Cadw commissioned Dyfed Archaeological Trust to undertake the geophysical survey of the site in the hope of identifying and characterising possible buried archaeological remains and determining if this is the site of a Roman fort. The fieldwork was undertaken in July 2012.

The geophysical survey revealed a complex range of archaeological activity throughout the surveyed area, these included features characteristic of the remains of a Roman Fort, namely the shape and size of the site along with its distinctive defensive ditches and possible central entranceways. These features appear convincing enough to confirm this as the site of a Roman fort.

A variety of archaeological features were revealed on the interior of the fort. Despite the clarity of the readings it is not immediately apparent as to what these various features relate to. There appears to be some possible structural remains, the suggestion of further internal defences and enclosures and the presence of several hearths or kilns amongst other unidentifiable features. Typical Roman fort features, such as barrack blocks, granaries and road layouts (amongst others), are not clearly represented on the geophysical survey results, although it is suggested that the central Principia may be identifiable.

A large (c.35m square) central enclosure was identified, not aligned with the fort defences, suggesting this represents post-Roman occupation of the site. The function and exact date of this enclosure is unknown. It is suggested it may be similar in form to other known Early Medieval sites in Southwest Wales, but its alignment and size does not accord closely with these other sites. This re-use, and apparent ploughing marks within the fort, may have served to obscure some of the earlier Roman-period features.

The survey included a relatively small area to the north of the fort defences, within which some possible linear features may suggest the presence of a vicus. A trackway was also recorded, relating to the later quarry along the eastern side of the site.

This fort represents the most westerly Roman fort so far identified within Wales. However, further more intrusive archaeological work would be required to establish a firm date for the site as well as to characterise the numerous features identified, the state of preservation, and explain the apparent lack of many of the typical internal features of a Roman fort.

INTRODUCTION

Project commission

A possible Roman Fort has previously been suggested at this site (SN 026 187), near Wiston in Pembrokeshire, due to the presence of a large U-shaped ditch or hollow approximately 35m wide and 140m long with two perpendicular arms, and its location c.50m to the north of the remains of a Roman Road. The wide nature of the ditch/hollow, the fact that the site is labelled 'Old Quarry' on the Ordnance Survey maps and the shape of the site meant that the Roman fort interpretation has been dismissed in the past, and it is recorded on the Dyfed Historic Environment Record simply as an 'Earthwork' (PRN 5683). However, recent Lidar data shows the arms of the ditch continuing further to the west than is shown on maps and aerial photographs, and that they may turn to form a rectangular enclosure with a possible entrance on the south side facing the Roman road. A 1st century coin and other Roman finds have also been recovered by metal-detectorists close to the site. Therefore the suggestion that this site may be a Roman fort could be correct.

No Roman forts are known west of Carmarthen, and the site also lies on agricultural land and therefore experiences slow degradation common to all sites in that environment. It was proposed that a geophysical survey of the site, covering approximately 3ha, was needed to characterise the nature of the site. It may be seen as the first stage of a larger project aimed at fully characterising the nature, extent, significance and condition of any archaeological remains associated with the possible fort.

Cadw provided grant aid to Dyfed Archaeological Trust to undertake the geophysical survey of the site in the hope of identifying and characterising possible buried archaeological remains. The fieldwork was undertaken in July 2012.

Scope of the project

The project aim was to characterise by geophysical survey, using a gradiometer, possible buried archaeological features in the area of, and in particular relating to, the possible Roman fort. The information from the survey could then be used as the first stage in a larger project to determine the exact character, survival and depth of any identified remains.

In addition to clarifying the character of the site, the project offered an opportunity to address two objectives, identified in the Roman Wales section of the 'Introducing a Research Framework for the Archaeology of Wales', namely archaeology of the early campaign years and interaction between Roman occupiers and the indigenous population. The work will also allow the enhancement of the Dyfed Historic Environment Record (HER).

Report outline

Because of the limited nature of this project, together with the considerable archaeological evidence in the wider area, this report is restricted solely to the results of the geophysical survey.

Abbreviations

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). Gradiometer readings are measured in nanoTesla (nT).

Timeline

The following table illustrates the approximate dates for the archaeological periods discussed in this report:

PERIOD	APPROXIMATE DATE
PALAEOLITHIC	c.120,000 BC – c.10,000 BC
MESOLITHIC	c.10,000 BC – c.4400 BC
NEOLITHIC	c.4400 BC – c.2300 BC
BRONZE AGE	c.2300 BC – c.700 BC
IRON AGE	c.700 BC – c.43 AD
ROMAN	c.43 AD – c.410 AD
EARLY MEDIEVAL	c.410 AD – c.1086
MEDIEVAL	c.1086 – c.1536
POST MEDIEVAL	c.1536 – c.1900
MODERN	c.1900 onwards

Table 1: Archaeological and historical timeline

THE SITE

Location and Archaeological Potential

The site is located on a slight plateau c.500m to the northeast of Wiston, in Pembrokeshire (Figure 1 - SN 026 187). The land rises gradually to the south on to a ridge on which the village of Wiston is sited. Immediately to the east of the site the ground falls away into a small local scrub-covered valley along which a stream flows.

The field in which the site is located is bounded by hedgerows. Churchill Farm lies immediately to the north and a road between Wiston and Clarbeston Road runs roughly north – south to the west of the field. The eastern limit of the site itself is defined by a U-shaped hollow approximately 35m wide and 140m long aligned north-northwest – south-southeast.

The underlying geology consists of an outcrop of sandstone of the Cethings Sandstone Member, in an area generally characterised by mudstones.

Several aerial photographs of the site exist from the 1980s. The line of the Roman road west from Carmarthen has been traced as far west as this area by studying aerial photographs. The possibility that this site may represent a Roman Fort has been suggested in the past, but it has largely been dismissed as a former quarry and earthwork and the site has not previously been archaeologically investigated.

The hollow has clearly been quarried in the past, and is marked as an 'old quarry' on the 1st edition Ordnance Survey map of 1889. The current landowner and farmer of the field, Mr Morris, stated that the hollow was formerly used (within his lifetime) as a convenient area to enclose the sheep for shearing. In recent years the hollow has become scrub covered and part of the northern arm of the quarry has been filled to extend the area available for pasture. The field has been within the Morris family for several generations, farmed from nearby Churchill Farm. Mr Morris stated that within his lifetime, and to his knowledge within his father's lifetime too, this field has not been deep ploughed, and has been used exclusively as pasture. At the time of the survey the field was covered by recently cut improved pasture, normally grazed by cattle.

METHODOLOGY

A fluxgate gradiometer was used for the survey, which detects variations in the earth's magnetic field (full specifications are in Appendix 1). Readings were taken at a medium resolution on traverses 0.5m wide and every 0.25m within a 20m x 20m grid across the site. In total an area of c.2.6ha was surveyed. A Trimble TST was used to tie the survey grid into the local Ordnance Survey grid.

Limitations

The survey was undertaken over a total of four days in July 2012. Weather conditions were fine and generally dry and often sunny, with the occasional brief shower. The fields were bounded by hedgerows, some containing wire fencing, which may have obscured readings taken in their immediate vicinity. Electric fencing was in use at the northern end of the field, preventing survey work within its vicinity. The field was generally level and under short pasture, although there were still some prominent earthworks and dense scrub preventing survey work along the eastern side of the site. Pacing lines were used throughout the survey and any variations in the data collections are likely to have been small.

The underlying geology and soils did not appear to cause any geological distortions of the geophysical survey results.

Processing, presentation and interpretation

Processing was performed using *ArchaeoSurveyor 2.5*, detailed explanation of the processes involved are described in Appendix 1. The data is presented with a minimum of processing (Figures 3 & 4), but the presence of high values caused by ferrous objects tends to hide fine details and obscure archaeological features, thus the values were 'clipped' to remove the extreme values allowing the finer details to show through. The survey was clipped to a range from 10nT to -10nT. During the survey the presence of small surface iron anomalies, typically deriving from modern material, causes spikes in the data. These have been removed using median values.

The processed data is presented as grey-scale plots overlaid on local topographical features (Figures 5). The main magnetic anomalies have been identified and plotted onto the local topographical features as a level of interpretation (Figures 6 - 13).

The 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.

All measurements given are 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.

RESULTS

Geophysical Interpretation (Figures 4 to 13)

The geophysical survey shows a complex range of archaeological activity throughout the surveyed area, therefore only the major features are discussed. Any interpretation from these geophysical results is by its nature speculative and precise details about the context, function, state of preservation and date of any archaeological features would require further intrusive investigation.

Defensive Ditches (Figure 7)

The outline of the site as defined by the wide ditches visible on the Lidar results (Figure 14) corresponds closely to the outline of a typical Roman fort. The geophysical survey results gives further definition to what appear to be characteristic defensive ditches adding strength to claim that this represents the site of a Roman fort.

These defences are still identifiable as topographical features on the ground. To the east the defences have clearly been enlarged by subsequent quarrying, creating a trench up to 42m wide in places with rock cuttings visible, now shrouded in scrub. This quarrying follows the right-angled turn of the original defences to the north, becoming shallower, and covered in both thick gorse scrub and a pond. The quarrying did originally extend further westwards for c.20m, but it has been infilled with topsoil and turf spread over the top to extend the area of improved pasture. This can be seen in the survey results, as an area of strong bipolar magnetic readings, typical of modern detritus.

A short distance to the west are three adjacent linear features, picked out by magnetically positive readings that are often indicative of cut archaeological features such as ditches. The presence of three concentric enclosure ditches is characteristic of Roman fort defences. The magnetic readings in-between and surrounding these linear features are generally far more negative, often indicative of raised archaeological features such as banks. These linear features extend for c.40 – 45m before they appear to curve off to the south just as they meet the edge of the field. Triple ditched defences have been recorded from other Roman forts, such as Llanfor near Bala in Merioneth and Caersws on the banks of the river Severn in Powys. The two, seemingly narrower, northernmost ditches run along a hollow that still exists topographically. The southernmost ditch lies outside this topographical hollow, running along its southern edge. It also extends slightly beyond the line of the northernmost ditches. These ditches presumably end at an entranceway through the defences (see below), but there is no indication of the southern ditch extending beyond the entranceway to the east.

As the ditches began to turn at the edge of the field, the line of the defences presumably run along the line of the current road. It is not uncommon to find roads and tracks running along the line of earlier Roman defences.

The southern line of the defences can also be seen running in front of the hedge-line, although the definition of these ditches has been blurred. Topographically this area also lies within a hollow. The inner (northern) edge is visible along the length of these defences, becoming quite pronounced at the northeastern end. The southern side is largely obscured by, or forms part of the hedgebank, although again a section is relatively well pronounced at the northeastern end. Traces of a double-ditch can be seen on the geophysical survey results running along this hollow for c.70m from the southwest corner of the field before it becomes fragmented midway along, presumably around the entranceway to the fort. The line of double ditches is then continued to the

northeast, although it appears to have been stepped inwards slightly with a possible third ditch apparent. Along the northern edge of the hollow the survey results suggest the line of a further ditch, similar to what can be seen along the northern defences. There appears to be a shift in the alignment of this northern ditch roughly midway along, again presumably associated with the entranceway into the fort.

The lack of clear definition for these southern ditches is likely to be due to the presence of a later trackway running along the hollow (see below).

Entranceways (Figure 8)

Along the northern side of the defences there is a well-defined end to the two northernmost defensive ditches and the hollow within which they sit. The southernmost of the three ditches extends further, by c.5m or so. To the northeast the continuation of the line of the defences is not as well defined due to the later infilling, although a similar arrangement of ditches with an abrupt end can be seen from the aerial photographs (photo 2). There is clearly a gap in the defences here, slightly offset to the west of the centreline.

Survey readings at this point suggest a variety of activity crossing the line of the defences, although their true form is masked by the later infilling. There is a linear feature, possibly ditched, running at a slightly angle south-southeast – north-northwest, with a possible dogleg along its length. There is some suggestion this line may be continued to the north with magnetically negative readings, which may indicate a bank, wall or similar. On the inside of the fort are several discrete features that may represent pits or postholes. It is impossible to determine relationships from geophysical results alone, but these features could conceivably represent some entranceway structure, such as a gate-tower or bridge.

The southern defences are masked by a possible later trackway that ran along them. However, the innermost ditch shifts alignment slightly, but noticeably, southwards roughly midway along its length. Similarly the outermost ditch or ditches become somewhat fragmented at this point, which could point to the siting of an entranceway disrupting the lines of the defensive ditches roughly midway along the southern side of the forts' defences.

This siting of entranceways is again typical of Roman forts. Opposing entranceways midway along the defences would give access onto a straight road running up to the central square *Principia*, which would essentially have been built over the line of the road. Opposing entrances in the remaining two sides of the rectangular fort would be slightly offset to give access onto a straight road that ran alongside the edge of the central *Principia*.

Principia (Figure 9)

Roman forts vary from site to site, but share many standard characteristics. One typical feature is a central *Principia*, the headquarters block. Rectilinear ditches on this site could depict the site of a *Principia*, although here it seems to be associated with a possible later, post-Roman, enclosure (see below). However, there is clearly a miss-match with the alignments in this later enclosure, which may indicate that it is re-using, at least in part, earlier Roman features. Those ditches that do appear to align themselves with the Roman fort define an area c.18m southeast – northwest, by c.16m, although the southwest side would therefore appear to be defined by less well-defined discrete pits or postholes, rather than the ditches defining the remaining three sides.

Internal Features (Figure 10)

Geophysical surveys of Roman forts are often characterised by their distinctive internal features that can be readily compared with other known examples. The Principia is one such example. Regular straight-sided enclosures and building outlines aligned with the defences give indications as to the locations of other similar features, such as the commanders house (Praetorium), barracks (strigae), granaries (horrea), hospital (valetudinarium) and workshops (fabrica) amongst others. These areas are often subdivided by straight 'streets', including one near-central, wide main street crossing the entire fort from entranceway to entranceway, and a second central street running up to the central principia. Although many features show up clearly on these geophysical survey results, often with strong magnetic readings, many of these typical fort features are not so easily discerned. The reasons for this are unclear, and would require further intrusive investigation. However, the large enclosure within the fort would appear to be a later, post-Roman, occupation of this site (see below), and it is possible this later activity has masked underlying results. Also, there is clear linear striping within the fort, but not outside. This striping is characteristic of ploughing suggesting the interior of the fort has come under the plough at some point in its history which likewise could serve to mask underlying results. This defined ploughing within the fort area would also indicate it survived at the time of ploughing as a clear visible feature.

That being said, numerous linear and more discrete areas of magnetic readings indicate a variety of archaeological activity across the site. At the southern end of the fort lie a series of semi-linear features aligned with the fort defences, which, in the southwest corner especially, are interspersed with more discrete, almost square, features. In between these features and the defensive ditches the general magnetic readings suggest an area of different material, possible remnants of an internal defensive bank. These semi-linear features may represent defensive features, such as walls and interval towers, along or behind this bank, or they may represent the partial remains of internal buildings or enclosures.

On the internal side of these features are several discrete areas of strong magnetic readings. These readings are visible on the survey results (figure 5) as dark circular features surrounded by a white rim. Such strong and distinctive readings can sometimes be indicative of areas that have been exposed to intense heat, such as would be expected from the site of a kiln or a hearth.

Similar readings can be identified to the north. Two such areas lie within the later enclosure, however they also lie on an alignment that would work within the Roman fort, and may therefore be part of the activity within the fort. Just to the west a linear feature appears to run towards the defences at an angle, unfortunately undergrowth from the adjacent hedgerow meant this area was not fully surveyed.

Around the inner side of the northern defences the readings gave generally quite mixed results, with individual features difficult to determine. As this corresponds to the line of the defences this appears to represent an area of general archaeological activity.

There are several longer linear features within the fort, but without further exploration it is not clear how these may relate to the Roman fort or what period they may date to. Two linear features are identifiable running along the eastern side of the fort, the magnetic readings suggesting they are ditches, or gullies. Running diagonally across the site, in a northeast – southwest direction is a

somewhat sinuous linear feature of magnetically negative results. Such results are sometimes indicative of buried banks or walls, however such features appear unlikely in this case, and similar readings have been found to relate to buried ceramic drains or similar.

Numerous other features are spread throughout the interior of the fort, but without large-scale excavation it is difficult to determine which, if any, relate to archaeological activity or the nature of that archaeological activity.

External features (Figure 11)

An area c.100m wide and c.60m long was surveyed beyond the northern limits of the fort's defences. Along the western edge of this area lay the original line of the current road to Wiston (see below). Along the outer edge of the defences lies an area of mixed magnetic readings that suggests an area of disturbed ground, possibly from the creation of the defensive ditches, and may even be an outer counterscarp bank.

A linear feature is visible that may be associated with the northern entranceway (see above). The magnetic readings suggest this may represent a ditch towards its southernmost extent, but the line then appears to be continued as a faint magnetically negative linear. The reason for this change in magnetivity is unexplained, it may be continued as a bank or wall, but the line could represent the continuation of the road or track to/from the northern entranceway, a line that almost lines up with a farm track alongside Churchill Farm to the north. Running perpendicular to this line are several faint linear features that may be archaeological in nature. If they are this could represent boundaries or enclosures consistent with a vicus, an area of civilian settlement and commerce that sometimes grew up around the entrances to Roman forts.

To the south the area beyond the fort defences was not surveyed, lying as it does within a separate field (similarly the area to the west). The line of the main Roman road has been identified from aerial photography crossing the field to the south, c.57m from the fort, and the two were presumably connected via a road or track from the southern entranceway. On the south side of this road line, close to the summit of the ridge, several unidentified linear features or enclosures have been recorded from aerial photographs (photo 3), although the function or date of these features has not been established.

To the east of the fort, beyond the defences and the later quarrying, the ground drops away into a small valley, along the base of which runs a stream, with the valley base relatively waterlogged. This area was not surveyed, but the presence of a watercourse here could potentially provide a good location for a bath house often found in association with Roman forts.

Later enclosure (Figure 12)

Within the fort lies a square enclosure, c.35m square, set off-centre to the northwest, orientated roughly west-northwest- east-southeast, and seemingly not aligned with the rest of the fort. The enclosure is formed on three sides by well-defined (in terms of their magnetic readings) ditches. On its southeast side the square is enclosed by a fragmented linear ditch, with a break both at its southern end and centrally. However, the enclosure appears to extend further to the southeast with ditches forming an angled, almost pointed southeast end. There is the suggestion of an entrance into the enclosure in the southern side and also midway along and possible also at the northern end of the east side. Internally there is a linear feature that angles off into the triangular eastern part of the enclosure. As has been suggested above, the unusual alignment of the pointed

southeastern end may suggest a partial re-use of existing Roman features, in this case the possible outline of the Principia in the centre of the fort.

Within the main square enclosure there are a variety of short linear features and more discrete areas that may represent ditches and pits or postholes, but appear to show archaeological activity within the enclosure although nothing is decidedly structural. Two large discrete areas in the western part of the main enclosure have the appearance of sites of intense burning, such as a kiln or hearth.

On the southern side of the enclosure another less well-defined linear feature appears to enclose a triangular area attached to the main enclosure – there is no indication of the linear feature extending under (or over) the main enclosure. Readings within this area suggest possible pits or postholes lying within, although without further intrusive investigation it is not possible to determine which phase of activity any of these more discrete features may be associated with.

The angle of this enclosure jars with the typical layout of a Roman fort where internal enclosures and buildings would be aligned with the defences. This would suggest this feature either pre- or post-dates the Roman period use of the fort. The strength of the readings, in comparison with the presumed Roman period features, along with the suggested re-use of the Principia, would suggest this feature post-dates the Roman period use. Some of the internal features may also be earlier Roman features rather than associated with the enclosure, it is not possible to date them without further archaeological investigations.

Similar square enclosures have been identified from aerial photographs within South-west Wales and presumed to be from the Early Medieval period. These include chapel sites, although unlike this enclosure they are often aligned east-west in accordance with Christian tradition. Other possible unaligned square enclosures and are assumed to be Early Medieval grave sites (although this has not been proved through excavation). These sites are described as square barrows, and have been recorded at a few locations such as Ffynnon Llygoden (PRN 35727 & 50166) in Llangoedmor, Ceredigion, and Gogerddan (PRN 11826) in Trefeurig, Ceredigion. However, these sites tend to be markedly smaller, between 12 and 17m across. If this site does date to the Early Medieval, or indeed the Medieval period, it is likely the Roman fort defences would still have been relatively prominent features.

Later Roads (Figure 13)

The current road that links Clarbeston Road to the north with Wiston to the south, running past Churchill Farm, appears to run along the western ditch defences of the Roman fort. This is a common feature of many Roman forts, with later roads and tracks utilising the ditches around the forts. The current owner of Churchill Farm stated that his grandfather shifted the original alignment of this road. The original course ran through what is now the forecourt of the farmyard, effectively immediately east of the current road line. This was shifted to the other side of the hedge line as it ran past the farmstead to move the road away from the farm buildings. The former route of the road can be seen in the north-westerly corner of the survey results, which can still be traced in the current topography of the field.

The southern defences of the fort are less well-defined than those to the north. The topography suggests this was used as an access route from the main road to the quarry, and therefore the underlying results are likely to have been effected by material laid down to facilitate this track. It is possible the prominent profile of the defensive ditch at its northeastern end may have been created or

affected by the establishment of this later track. During a particularly dry summer the farmer (Mr Morris) claims it is possible to see the parched cropmark of a trackway through the field to the southwest of the fort which appears to roughly line up with this track along the forts southern defences. He claimed it is possible to trace the cropmark as far as the medieval motte and bailey in Wiston to the southwest.

CONCLUSION

The geophysical survey revealed features characteristic of the remains of a Roman Fort, namely the shape and size of the site along with its distinctive defensive ditches and possible central entranceways. These features appear convincing enough to confirm this as the site of a Roman fort.

A variety of archaeological features were revealed on the interior of the fort. Despite the clarity of the readings it is not immediately apparent as to what these various features relate to. There appears to be some possible structural remains, the suggestion of further internal defences and enclosures and the presence of several hearths or kilns amongst other unidentifiable features. Roman forts typically contain a standard set of internal structures that align with the surrounding defences, such as barrack blocks, granaries, workshops, road layouts and so on. These features are not immediately apparent on the geophysical survey results within this fort, although it has been suggested that the central Principia may be identifiable. The fort appears to have undergone later re-use and the survey results indicate the interior has also been ploughed at some point in its history, both of which may serve to mask underlying features but even so the lack of a clearly identifiable internal layout cannot be fully explained without further intrusive archaeological investigation.

A large (c.35m square) central enclosure was identified, not aligned with the fort defences suggesting this represents a later, post-Roman, occupation of at least part of the fort. The clarity of the ditches that define the enclosure, and the suggestion it may be incorporating part of the former Principia, suggests its post-Roman attribution. The function and exact date of this enclosure is unknown, it is suggested it may be similar in form to other known Early Medieval sites in Southwest Wales, but its alignment and size does not accord closely with these other sites.

The survey included a relatively small area to the north of the fort defences, within which some possible linear features may suggest the presence of a vicus. The line of the main East – West Roman road has previously been identified just over 50m to the south of this fort, beyond which lies further unidentified cropmarks.

This fort represents the most westerly Roman fort so far identified within Wales. Prior to the survey a Roman presence west of Carmarthen, although suspected due the presence of the nearby Roman road, had not been confirmed. This fort lies c.40km to the west of Carmarthen, given that Roman forts in this area tended to be sited roughly within 20km of each other this suggests the presence of another fort between Wiston and Carmarthen, and one is suspected in the Whitland area. This also suggests the possibility of further activity to the west, the coastline around Solva lies another c.20km to the west along the projected line of the Roman road, although the road has yet to be traced more than 1.5km beyond this fort.

It has long been suspected, due to the lack of identified forts, that Southwest Wales beyond Carmarthen provided relatively little resistance to the Roman invasions of the 1st century AD. The early Claudian and Neronian campaigns into Wales in the 40s and 50s AD appear to have been directed mainly against the Silures in the south and the Deceangli in the north. It is not thought they came as far west as Pembrokeshire, an area possibly under the control of the Demetae or Octapitae (there is little historical reference to the controlling tribes of this part of Wales). It is thought that this area of Wales came under Roman control during the campaigns of Julius Frontius in the mid-70s AD (the early-Flavian).

The forts at Llandeilo and Carmarthen date initially to this period, and this would seem the likely period for the establishment of this fort, however it is clear that the precise dating of this site could prove crucial in the understanding of the Roman conquest of Wales.

ACKNOWLEDGEMENTS

The survey was undertaken by Hubert Wilson and Phil Poucher of Dyfed Archaeological Trust. I am indebted to Mssrs Morris for allowing access to their land.

ARCHIVE DEPOSITION

The archive will initially be held by DAT, before being passed to the National Monument Record, Aberystwyth.

SOURCES

British Geological Survey, 1994, *The Rocks of Wales* 1:250,000.

Burnham, B C & Davies, J L 2010 *Roman Frontiers in Wales and the Marches*
RCAHMW, Aberystwyth

Clark A J, 1996, *Seeing Beneath the Soil* (2nd edition). Batsford, London.

Ordnance Survey 1889 1st edition 1;2500 Map, Pembrokeshire XXIII.15

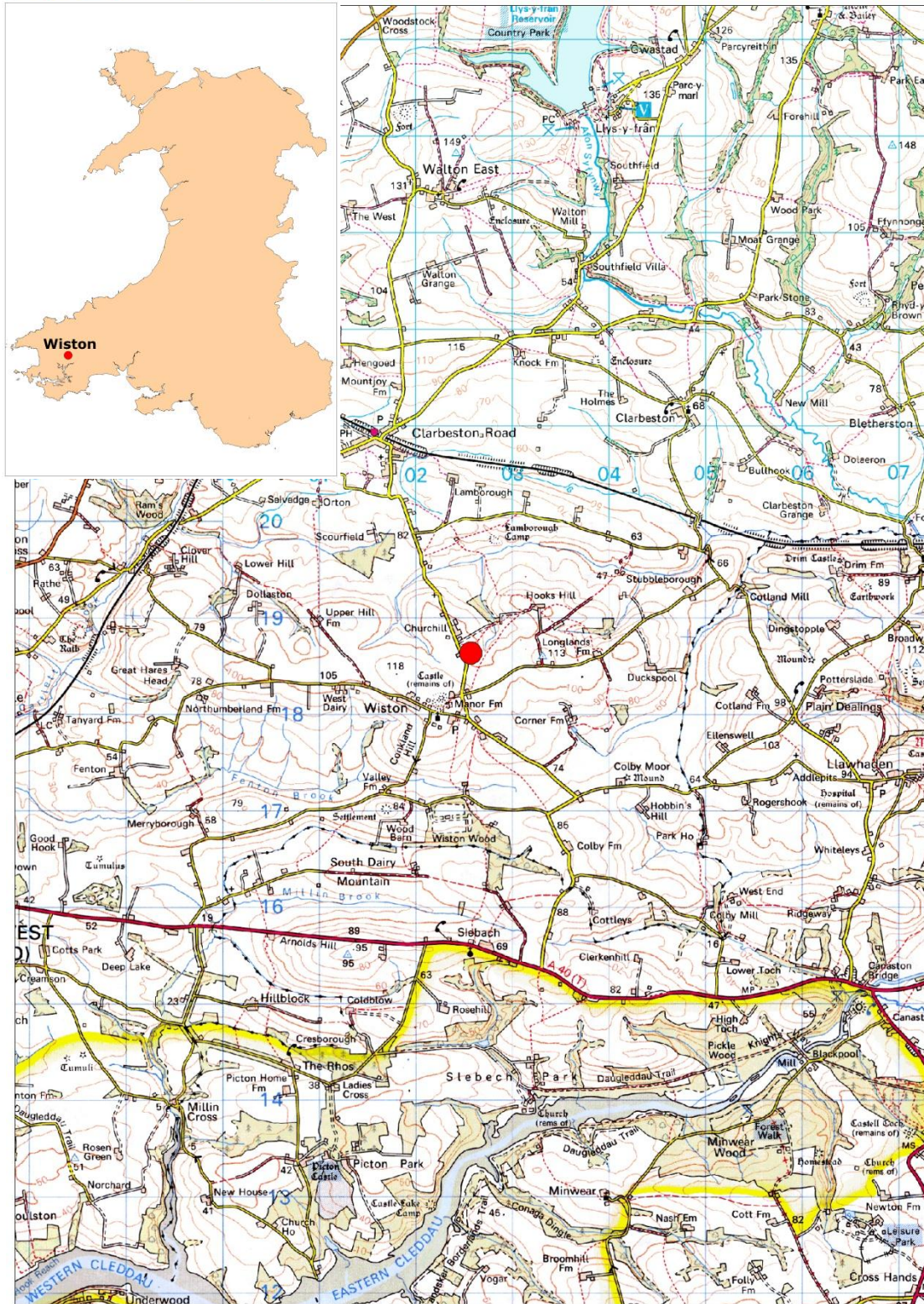


Figure 1: Location map, based on the Ordnance Survey.

Reproduced from the 1995 Ordnance Survey 1:50,000 scale Landranger Map with the permission of The Controller of Her Majesty's Stationery Office, © Crown Copyright Dyfed Archaeological Trust, The Shire Hall, Carmarthen Street, Llandeilo, Carmarthenshire SA19 6AF. Licence No AL51842

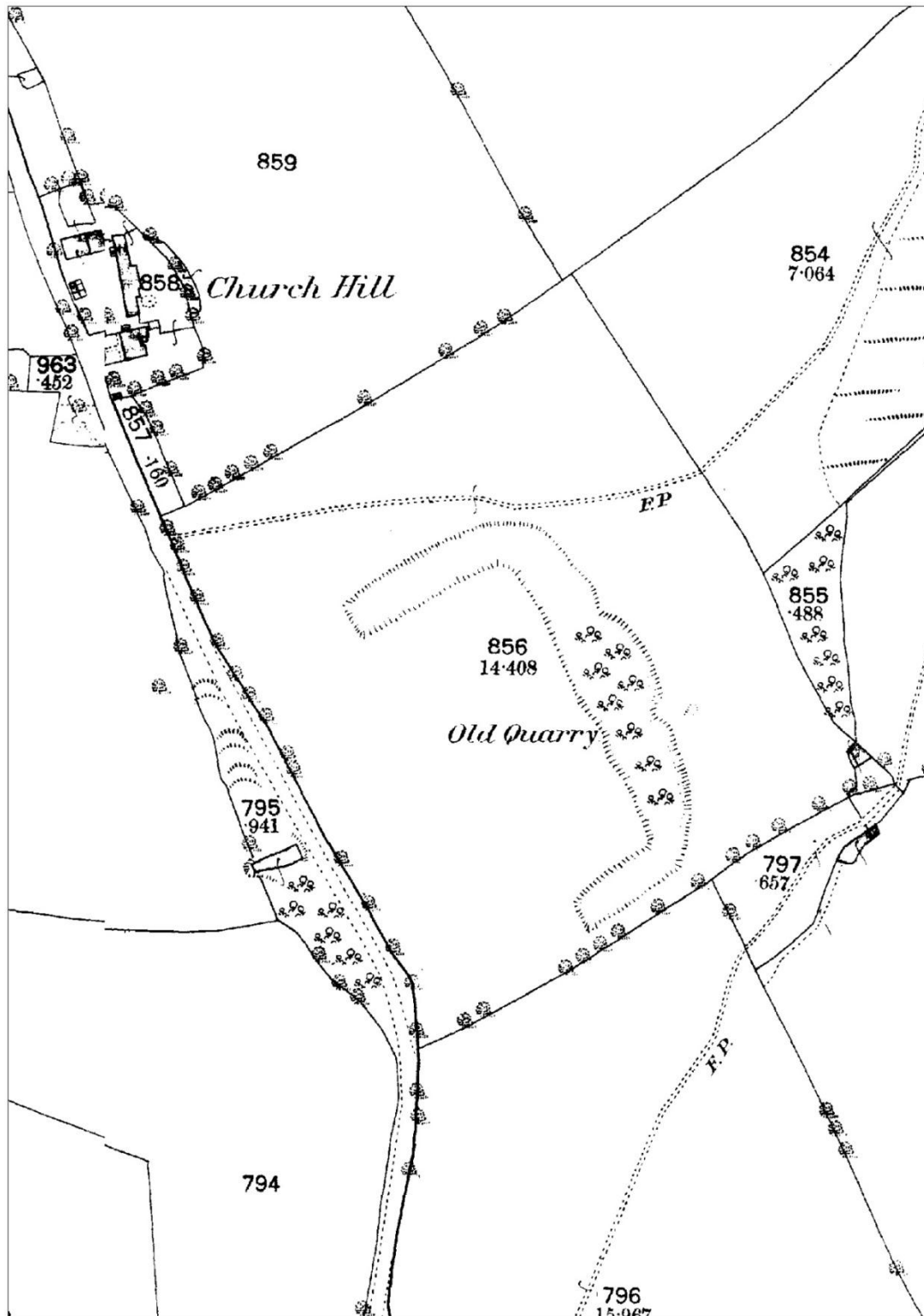


Figure 2: An extract from the 1st edition 1:2500 Ordnance Survey map of 1889, showing the site as an 'old quarry'.

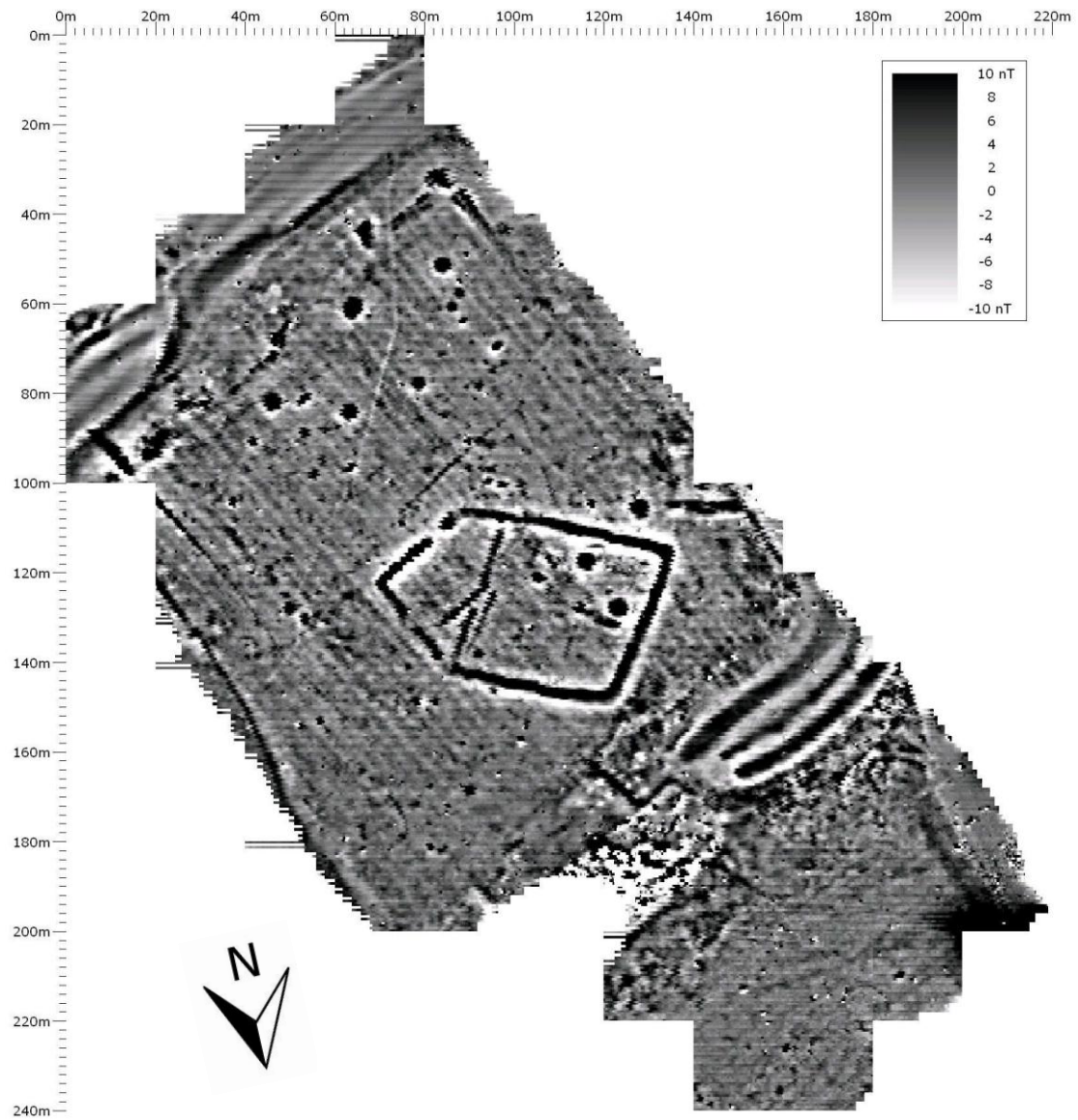


Figure 3: Geophysical survey results presented as a greyscale plot, clipped to a range from 10nT to -10nT but otherwise unprocessed. **Please note, Figures 3 & 4 are orientated differently, with north to the bottom of the page.**

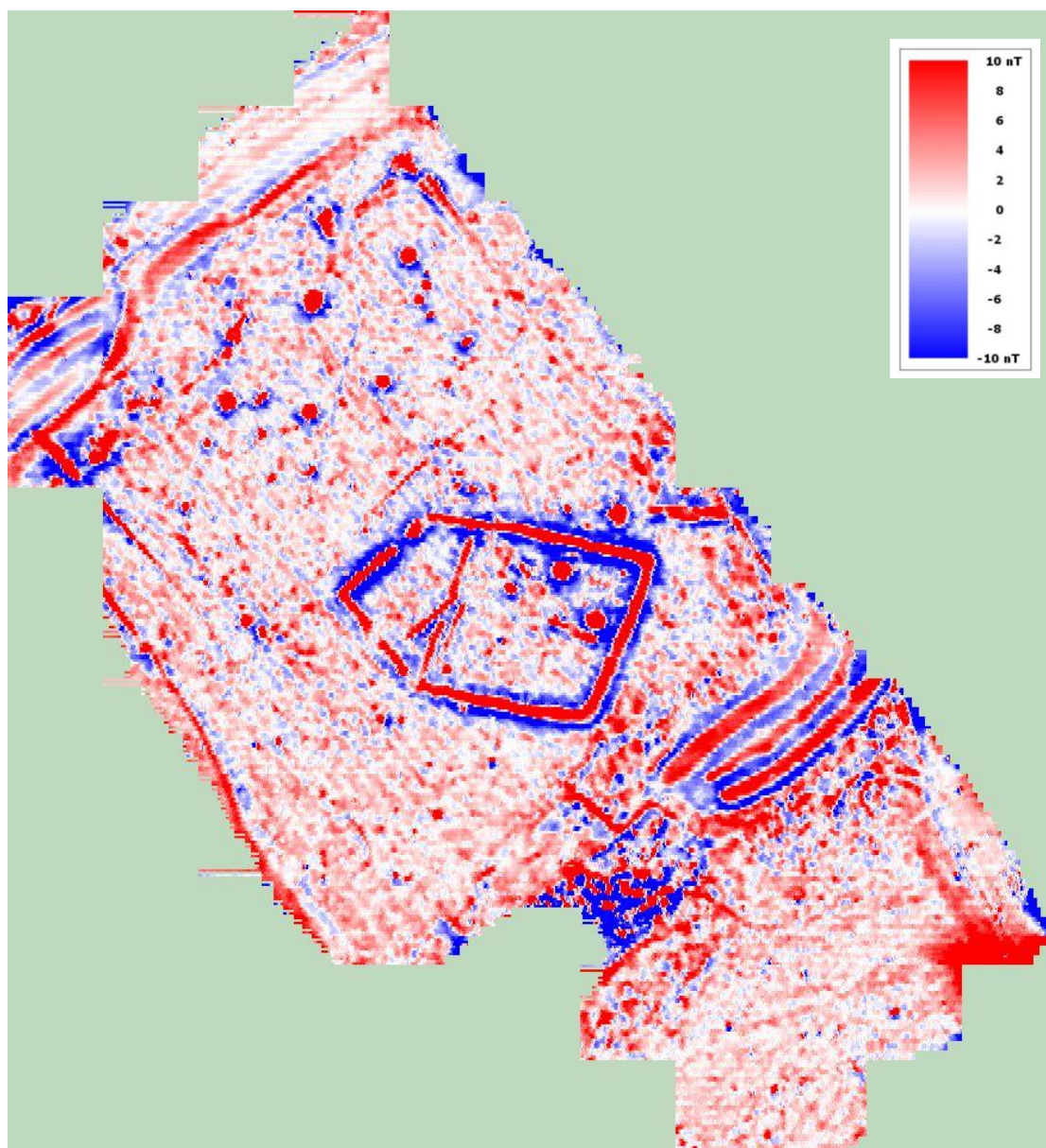


Figure 4: An alternative view of the geophysical survey results in a red to blue scale. **Please note, Figures 3 & 4 are orientated differently, with north to the bottom of the page**



Figure 5: The geophysical survey results, orientated to north and set within local topographical detail.



Figure 6: Main anomalies identified from the geophysical survey set within local topographical detail. Red represents magnetically positive readings, green magnetically negative, paler green are areas of mixed bipolar readings.



Figure 7: The defensive ditches, in red and green.

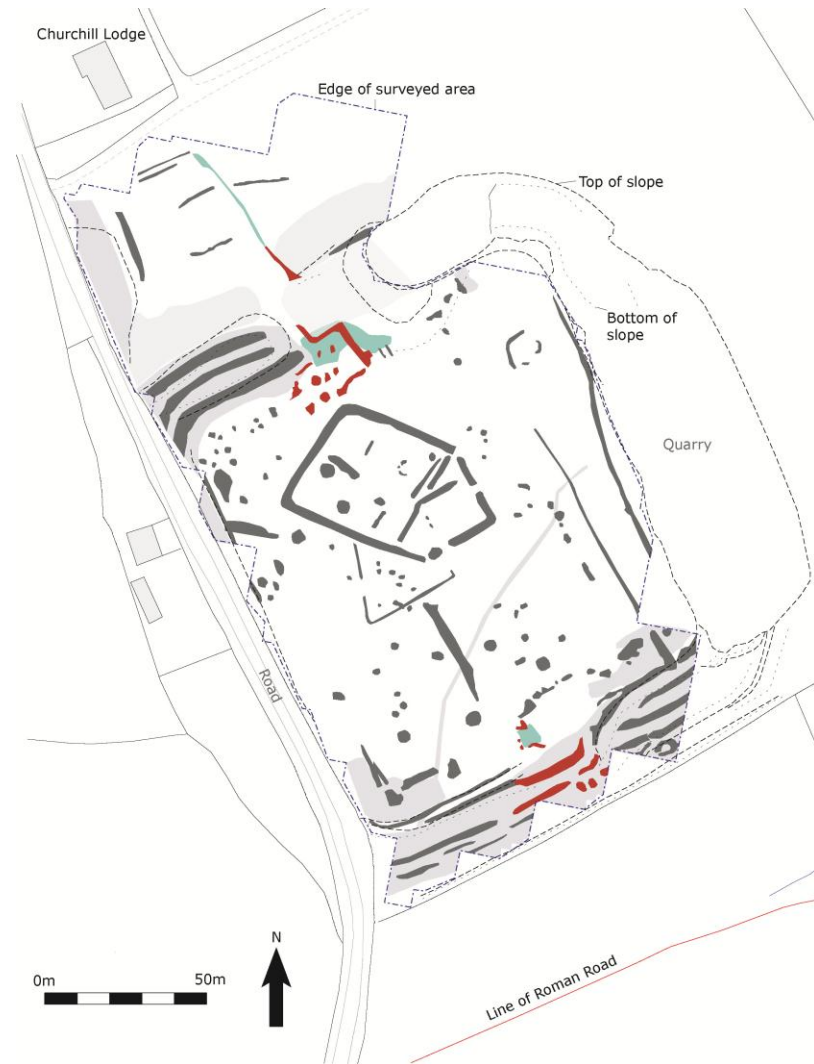


Figure 8: The possible entranceways, in red and green.

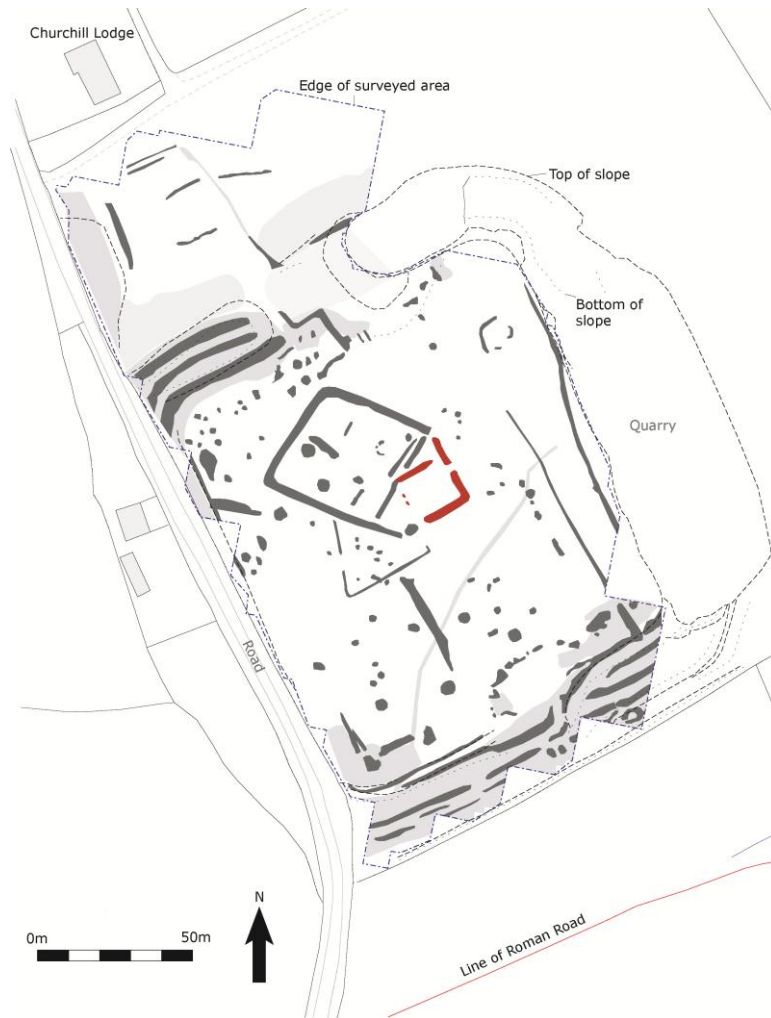


Figure 9: The possible Principia, in red



Figure 10: Internal features possibly relating to the Roman fort, in red and green.



Figure 11: External features, in red and green

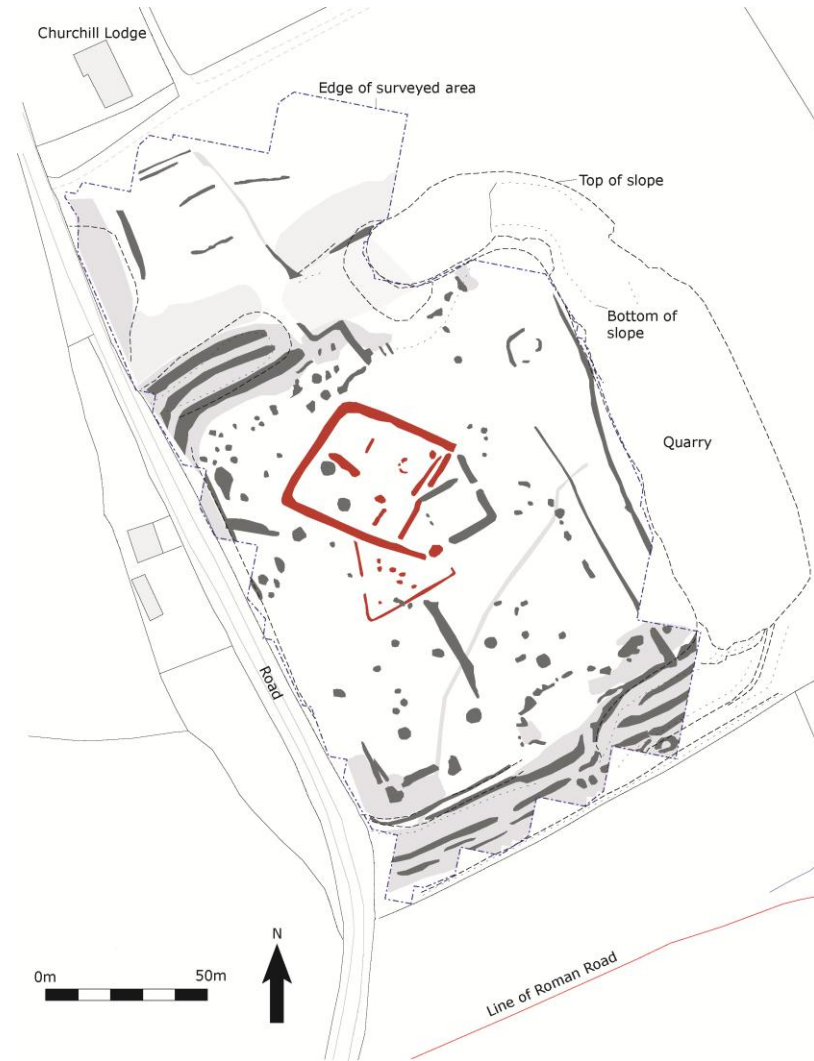


Figure 12: The possible post-Roman enclosure, in red.



Figure 13: The later roads, in green.



Photo 1: Aerial photograph of the site, taken in 1955 (Meridian airmaps).



Photo 2: Aerial photograph of the site taken in 1986, looking south, showing the arms of the fort prior to infilling, and possible ditches within.



Photo 3: Aerial photograph from 1981, looking NNW. The quarried eastern side of the fort is visible as the scrub-covered line in the top right, this photo shows the various unidentified cropmark features recorded in the lighter-coloured field to the south.



Photo 4: An aerial photograph from 1994, looking NE. The village of Wiston is visible in the foreground, with its medieval motte and bailey castle on the right. The Roman fort is just visible top centre.



Photo 5: A recent aerial photograph of the site taken by the RCAHMW, looking north.



Photo 6: A recent aerial photograph of the site taken by the RCAHMW, looking WSW.



Photo 7: Looking SE across the site at the time of the survey. The line of the northern defensive ditch is picked out by the scrub on the left, and the hollow on the right, within which the telegraph post sits.



Figure 14: The Lidar image of the site.

APPENDIX 1: METHODOLOGY AND INSTRUMENTATION

Geophysical Survey Instrumentation

A fluxgate gradiometer survey provides a relatively swift and completely non-invasive method of surveying large areas.

The survey was 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.

The instrument detects variations in the earth's magnetic field caused by the presence of iron in the soil. 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, however, 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 and can mask the relatively weak readings produced by variations in the soil. Archaeological features such as hearths or kilns also produce strong readings because fired clay acquires a permanent thermomagnetic field upon cooling. This material can also get spread into the surrounding soil leading to a more generalised magnetic enhancement around settlement sites.

Not all surveys produce good results as anomalies can also be masked by large magnetic variations in the bedrock or soil or high levels of natural background "noise" (interference consisting of random signals produced by material within the soil). In some cases, there may be little variation between the topsoil and subsoil resulting in features being un-detectable. It must therefore be stressed that a lack of detectable anomalies cannot be taken to mean that there are no below ground archaeological features.

The Bartington Grad601 is a hand-held instrument and readings can be 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).

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.

Geophysical Survey Data Collection

The gradiometer includes an on-board data-logger. Readings in the surveys were taken along parallel traverses of one axis of a grid made up of 20m x 20m squares. The traverse intervals were either 0.5m or 1.0m apart. Readings were logged at intervals of 0.25m along each traverse giving 3200 readings per grid square (medium resolution on 0.5m traverses), or 1600 readings per grid square (low resolution on 1.0m traverses).

Geophysical Survey Data presentation

The data was transferred from the data-logger to a computer where it was compiled and processed using ArchaeoSurveyor 2.5 software. The data is presented as grey-scale plot where data values are represented by modulation of the intensity of a grey scale within a rectangular area corresponding to the data collection point within the grid. This produces a plan view of the survey and allows subtle changes in the data to be displayed. A separate grey-scale plot with interpretation of the main features is also included as necessary.

Geophysical Survey Data Processing

The data is presented with a minimum of processing although corrections are made to compensate for instrument drift and other data collection inconsistencies. High readings caused by stray pieces of iron, fences, etc are usually modified on the grey scale plot as they have a tendency to compress the rest of the data. The data is however carefully examined before this procedure is carried out as kilns and other burnt features can produce similar readings. The data on some noisy or very complex sites can benefit from 'smoothing'. Grey-scale plots are always somewhat pixellated due to the resolution of the survey. This at times makes it difficult to see less obvious anomalies. The readings in the plots can therefore be interpolated thus producing more but smaller pixels and a small amount of low pass filtering can be applied. This reduces the perceived effects of background noise thus making anomalies easier to see. Any further processing is noted in relation to the individual plot.

Reliability

Geophysical survey is an immensely useful tool but it should be realised that while a survey will detect a wide range of features, it may not detect *all* buried features. A gradiometer survey detects changes in magnetic flux density and relies on there being a detectable difference between the archaeology and the substrate. This may not occur for many reasons (e.g. a cut feature being backfilled with subsoil). It must therefore be stressed that a lack of archaeological responses from a geophysical survey does not prove that there is no archaeology present.

Grid locations

The survey grids were located by measurements to fixed points such as field boundaries located during the survey.

Bibliography

Clark A J, 1996, *Seeing Beneath the Soil* (2nd edition). Batsford, London.

POSSIBLE ROMAN FORT, WISTON, PEMBROKESHIRE: GEOPHYSICAL SURVEY 2012

RHIF YR ADRODDIAD / REPORT NUMBER 2013/19

CHWEFROR 2013
FEBRUARY 2013

Paratowyd yr adroddiad hwn gan / This report has been prepared by

PHILIP POUCHER

Swydd / Position: ARCHAEOLOGIST

Llofnod / Signature  Dyddiad / Date 18/02/2013

Mae'r adroddiad hwn wedi ei gael yn gywir a derbyn sêl bendith
This report has been checked and approved by

JAMES MEEK

ar ran Ymddiriedolaeth Archaeolegol Dyfed Cyf.
on behalf of Dyfed Archaeological Trust Ltd.

Swydd / Position: HEAD OF FIELD SERVICES

Llofnod / Signature Dyddiad / Date

Yn unol â'n nôd i roddi gwasanaeth o ansawdd uchel, croesawn unrhyw sylwadau
sydd gennych ar gynnwys neu strwythur yr adroddiad hwn

As part of our desire to provide a quality service we would welcome any
comments you may have on the content or presentation of this report



INVESTOR IN PEOPLE
BUDDSODDWR MEWN POBL