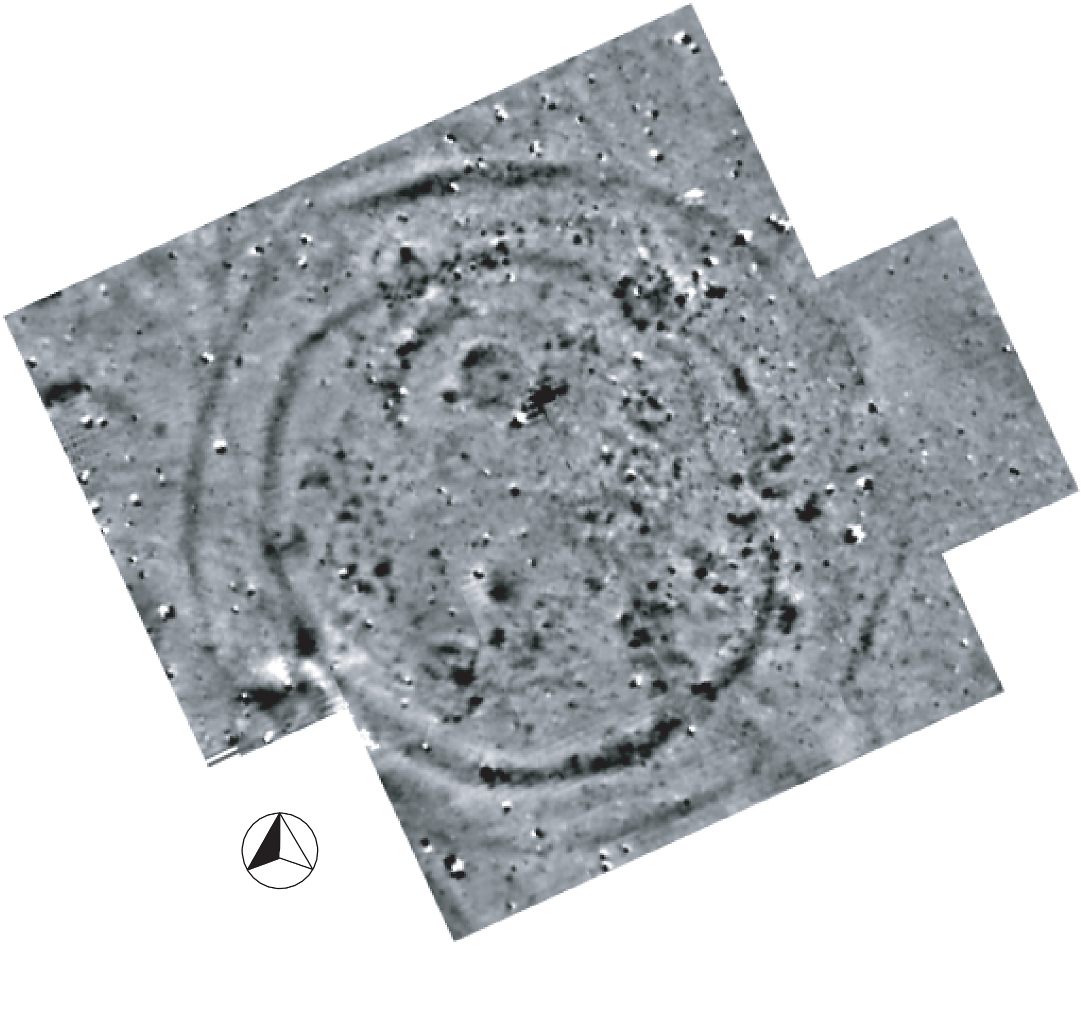
SURVEY OF PREHISTORIC DEFENDED ENCLOSURES IN NORTH-WEST WALES: ASSESSMENT OF SOME POSSIBLY EARLY MULTIVALLATE ENCLOSURES IN LLYN AND ANGLESEY 2006-7

Report No. 664



Prepared for Cadw
May 2007
By
G.H. Smith and D. Hopewell

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust
01248 352535 01248 370925 email : gat@heneb.co.uk
www.heneb.co.uk

SURVEY OF PREHISTORIC DEFENDED ENCLOSURES IN NORTH-WEST WALES: ASSESSMENT OF SOME POSSIBLY EARLY MULTIVALLATE CONCENTRIC ENCLOSURES IN LLYN AND ANGLESEY, 2006-7

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Cover: Bryn Rhydd defended enclosure, Nefyn, PRN 4370

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PAN-WALES PREHISTORIC DEFENDED ENCLOSURES SURVEY: ASSESSMENT OF SOME POSSIBLY EARLY MULTIVALLATE CONCENTRIC ENCLOSURES IN LLYN AND ANGLESEY, 2006-7

G.H. Smith and D. Hopewell

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1. INTRODUCTION

Hillforts and defended enclosures are one of the largest, most visible and impressive prehistoric survivals in the modern landscape. Many are situated on significant hilltops, which are well visited and their ramparts can be readily appreciated, as well as the views from them. In Wales the Celtic inheritance is directly relevant and is part of the National Curriculum so the sites have more than academic interest. Therefore, there needs to be further work on their interpretation and presentation. This need has been taken up in south-west Wales by work at Castell Henllys hillfort in Pembrokeshire and by the re-creation of a number of roundhouse settlements, at St Fagan's, Cardiff, and in North Wales at the Legacy Environmental Education Centre, Wrexham, the Llynnon Mill Centre, Anglesey and a proposed site at the Labyrinth, Gwydir Forest, Conwy. Non-defended settlements of the Iron Age and Romano-British period in north-west Wales have been the subject of a number of excavations in recent years. Hillforts and defended settlements, however, have been little studied, apart from the work carried out by Peter Crew at Bryn y Castell, Ffestiniog (Crew 1986). The pan-Wales survey of prehistoric hillforts and defended enclosures has provided an overview and up-to-date record of these sites and it is now intended to follow up this work through a number of projects to improve interpretation and presentation. The present project was designed to look at a group of defended enclosures of a particular type called 'weak double ringworks' by the RCAHMW. These are poorly known, because most have been affected by long term ploughing (Fig. 2). Their upstanding remains are therefore quite slight but it was hoped that geophysical and topsoil survey would provide much better understanding of their remains and survival, allowing better interpretation and assessment of their value and vulnerability.

Acknowledgements
Thanks got to all the landowners who readily gave permission for survey on their land. These were: David and Hugh Thomas for Conion and Meillionydd, Paul and Ann Webb for Castell Caeron, Captain and Mrs Wynne-Finch and Wyn Williams for Bryn Rhydd, Mr Owen for Y Werthyr, Llantrisant and Mr Tecwyn Thomas for Werthyr, Bryngwran. Thanks also go to John Rowlands and David Roberts for providing preliminary copies of relevant pictures from their aerial photographic survey of Anglesey and to Margaret Dunn for providing information about the Conion enclosure. Fig. 2 is reproduced by kind permission of the RCAHMW.

2. PROJECT DESIGN

Geophysical surveys were carried out by GAT in 2004-5 at two hillforts as part of the pan-Wales Defended Enclosures project. These were designed as a trial to test whether such survey might usefully add to the existing record. The two surveys were at the scheduled site of Dinas Dinlle, Caernarfon, Gwynedd and at the non-scheduled site of Y Werthyr, Llantrisant, Anglesey. These both proved to be very informative, with internal buildings identified at both forts, and many new details at Y Werthyr, which lies within a long-cultivated field and had been reduced to little more than a crop-mark.

It was therefore proposed that a more extensive programme of similar assessment should be carried out. The project was designed to study a specific group of defended enclosures that are at present known only from their defensive works, in some cases little more than crop marks. The enclosures are in the Llŷn peninsula and are characterised by being of regular sub-circular or oval outline, being on low rounded hilltops that are not naturally strongly defensive and with two concentric ramparts. This group was first identified by the RCAHMW and described as 'Weak double ringworks' (RCAHMW 1964, lxxvi-lxxviii) (Fig. 2). The type site was the only one of these to have been investigated, the scheduled site of Castell Odo, Aberdaron, Llŷn (Alcock 1960). Excavation there showed it to be a multi-phase site, starting as an undefended hill-top settlement in the Late Bronze Age or Early Iron Age, subsequently defended with a palisade and later by two earthen ramparts and ditches (Fig. 33). There is a possibility, therefore, that all these sites have early origins and so are of particular interest and certainly greater value than their low visible remains suggest.

Six enclosures were selected for study. These were five of those identified by the RCAHMW at Castell Caeron, Rhiw (PRN 1234), Conion, Rhiw (PRN 1207), Meillionydd, Rhiw (PRN 1205) Pen y gaer, Llangian (PRN 1236) and Pen-y-gaer, Llanbedrog (PRN 443, SAM C221). In addition, a similar site was included at Bryn Rhydd, Nefyn (PRN 4370) recorded during the previous Llŷn Cropmarks Survey by Richard Kelly (Ward and Smith 2001). During the course of the present survey tests at Pen-y-gaer, Llangian it was discovered that mineral-rich igneous rocks made geophysical survey unproductive on sites on rocky hilltops here. The second Pen-y-gaer site, near Llanbedrog, also lies on a rocky promontory and it was decided that these two sites were not suitable for survey. There being no other similar suitable sites on Llŷn, two similar sites on Anglesey were chosen. These were Y Werthyr, Llantrisant (PRN 2077) and Werthyr, Bryngwran (PRN 3505, SAM A42). These were both curvilinear bivallate enclosures on low rounded hills. Some trial geophysical survey had been carried out successfully at Y Werthyr, Llantrisant in 2005 (Hopewell, 2005) which showed both internal and defensive features even though the site is almost completely ploughed down. Werthyr, Bryngwran has visible defences but the interior has long been cultivated and even aerial photographs have failed to provide any evidence of internal settlement features. The locations of the surveyed enclosures are shown on Fig. 1.

In addition to the geophysical survey it was proposed to carry out some soil test-pitting to provide information about soil depths and subsoil types. This aimed to allow assessment of the survival of the sites and their vulnerability to future ploughing.

3. METHODS

The technical geophysical survey methods and the design for each site are described separately, below. The general approach was intended to survey the whole of each site, where accessible, including both the interior and defences and at least a sample of the exterior area. The survey was carried out at high resolution except at Y Werthyr, Llantrisant where lower resolution was used to match the previous survey there and at Werthyr, Bryngwran, where the area to be covered by the survey and the time available made low resolution survey necessary. Y Werthyr, Llantrisant and

Werthyr, Bryngwran were extensive sites that require a greater input of time to provide a complete cover than would have been the case with the original sites chosen on Llŷn.

3.1 GEOPHYSICAL SURVEY METHODOLOGY

D. Hopewell

Fluxgate gradiometer survey provides a relatively swift and completely non-invasive method of surveying large areas and is ideal for detecting large-scale features such as ditches, banks and areas of occupation.

Instrumentation

All geophysical work was carried out using a Bartington Grad601-2 dual Fluxgate Gradiometer. This 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.

This 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. This is a simplified description as there are other processes and materials which 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. Strong readings are also produced by archaeological features such as hearths or kilns because fired clay acquires a permanent thermo-remnant magnetic field upon cooling. This material can also get spread into the soil leading to a more generalised magnetic enhancement around settlement sites.

Not all surveys can produce good results as anomalies can 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 undetectable features. It must therefore be stressed that a lack of detectable anomalies cannot be taken to mean that that there is no extant archaeology.

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 1990).

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.

Data Collection

The gradiometer includes an on-board data-logger. Readings in the surveys were taken along parallel traverses of one axis of a 20m x 20m grid. The traverse interval was 0.5m at all sites apart from Y Werthyr where it was 1.0 m. Readings were logged at intervals of 0.25m along each traverse giving 3200 readings per grid (with a traverse interval of 0.5m).

Data presentation

The data is transferred from the data-logger to a computer where it is compiled and processed using ArchaeoSurveyor 2 software. The data is presented as a 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. This is supplemented by an interpretation diagram showing the main features of the survey with reference numbers linking the anomalies to descriptions in the written report. It should be noted that the interpretation is based on the examination of the shape, scale and intensity of the anomaly and comparison to features found in previous surveys and excavations etc. In some cases the shape of an anomaly is sufficient to allow a definite interpretation e.g. a Roman fort. In other cases all that can be provided is the most likely interpretation. The survey will often detect several overlying phases of archaeological remains and it is not usually possible to distinguish between them. Weak and poorly defined anomalies are most susceptible to misinterpretation due to the propensity for the human brain to define shapes and patterns in random background ‘noise’. An assessment of the confidence of the interpretation is given in the text.

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.

3.2 TOPSOIL SURVEY METHODOLOGY

The soil pit locations are shown on the plan of each site and the depths of the ploughsoil and description of the subsoil or base of the ploughsoil are shown in the accompanying tables.

The soil trial pitting was designed to test the depth of soil cover and record the type of subsoil over the interior and immediate exterior of each enclosure. The survey was carried out by small hand-dug pits, *c*. 0.30m square on the 20m grid laid out for the geophysical survey. At the first site, Bryn Rhydd, the pits were dug at 20m spacing and topsoil samples were also taken at a closer spacing to allow for possible soil phosphate and magnetic susceptibility analysis. These proved to be too time-consuming for the allowed time and for other sites no soil samples were taken and soil text pits were excavated on alternate 40m by 20m spacing. The two sites on Anglesey were extensive and required additional time for geophysical survey so no soil pits were dug. In addition, Werthyr, Bryngwran was a scheduled site and it was agreed that the available time would be used to carry out as extensive a geophysical survey as possible without the additional work of soil pitting, which would also have required full scheduled monument consent.

Three of the sites, Conion, Castell Caeron and Werthyr, Bryngwran have some upstanding remains that have been mapped by the Ordnance Survey and so have plans that could be used as a basis for the survey. One of the sites, Bryn Rhydd has very slight upstanding remains, surviving mainly as a crop mark and the geophysical survey now provides the best information about its layout. Meillionydd and Y Werthyr, Llantrisant have low earthworks and both these were mapped during the survey using the grid laid out for the geophysics. These proved very useful in interpreting the geophysical evidence. A few minor topographic features were also added at other sites in the same way.

4. THE SURVEY RESULTS

4.1 BRYN RHYDD, NEFYN, GWYNEDD (PRN 4370)

4.1.1 Introduction

This is a sub-circular bivallate enclosure, about 95m diameter overall. It lies on a very gentle rounded hill of gravelly sand at 50m OD overlooking a small stream, a tributary of the Afon Geirch, itself not much more than a stream, which flows into the sea on the coast to the north (Fig. 3). It is a sub-circular, bivallate enclosure and was first discovered from aerial photography and recorded in a study of cropmarks on the Llŷn peninsula by Richard Kelly (Ward and Smith 2001). The aerial photograph shows the two ditches clearly and there are a number of dark patches in the interior suggestive of roundhouse sites and a possible break in the outer bank at the east side that might be an entrance(Fig. 4). On the ground, the banks are just visible as very low earthworks. One side of the outer bank of the enclosure at the south-west has been partly removed by a gravel quarry.

4.1.2 Geophysical survey results

D. Hopewell

Survey conditions

The field was fairly flat and contained no obstacles apart from a gravel quarry which has destroyed a small part of the site. Weather conditions were mixed but should have no impact on the results.

Results (Figs 5-6)

An approximately square area of 100m x 100m was surveyed. Two additional 20m squares were added on the eastern side. Background noise levels were fairly low. There was an even spread of small ferrous responses, visible on the grey-scale plot as small anomalies, half black and half white, each representing a magnetic dipole. These indicate small pieces of stray iron in the soil, usually from derived from farmyard rubbish spread during manuring.

The site is bounded by a circular anomaly (1), best interpreted as a ditch. A second circular ditch (2) runs 10m inside of this. The outer enclosure is 90m in diameter; the inner 70m. Magnetically quiet areas to the inside of the ditches probably indicate the presence of ploughed-down ramparts (3 and 4). The position of an entrance is problematic. There seems to be a break in the inner ditch on the east side (5) along with a corresponding break or discontinuity in the outer ditch. The break in the outer is, however less convincing when viewed alongside aerial photographic evidence. An unbroken ditch is clearly visible on a *GetMapping* photograph. What seems to be a discontinuity (7) can be seen to be part of a later field boundary. A possible corresponding out-turn (6) is also not convincing when viewed with the photographic evidence. A fairly clear discontinuity in the line of the outer ditch (8) could mark an entrance but there is no evidence of a break in the inner defences... This may, however, be a result of more than one phase of activity being present. A faint rectilinear anomaly at this point could indicate a later feature overlying the outer defences. The interior of the defences contains several very clear circular anomalies between 8 and 11m in diameter (9 to 19). These are best interpreted as roundhouses, the anomalies being caused by a spread of magnetically enhanced material in the house interior. Stronger anomalies in houses 9 and 10 could be post holes. Houses 9, 10 12, 13, 14 and 18 overlie the inner defences and indicate that the ditch was in-filled and the rampart levelled by the time they were built. They do, however, respect the outer defences. A general area of noise (20) indicates activity from the earlier phase around the inside of the inner rampart. A narrow curvilinear anomaly (21) can be traced running along the inside of the rampart on the east side of the site. This is not very clear but could represent a narrow palisade trench or timbers associated with the rampart. Faint Anomalies 22 and 23 correspond to a former field boundary visible on aerial photographs and anomaly 24 is presumably associated with the quarry.

4.1.3 Topsoil survey

The locations of the pits are shown on Fig. 7.

Table 1 Bryn Rhydd Soil pit data

1. 0.30 Light brown silty sand with occasional sub angular gravel *c*. 30mm dia.
2. 0.38 ditto.
3. 0.41 Orange-brown silty sand with occasional sub angular gravel *c*. 30mm dia. (one struck flint at base of topsoil.
4. 0.39 Black charcoal(?)-rich sand. Possibly an archaeological feature. Not bottomed.
5. 0.40 Orange-brown sand with occasional small gravel.
6. 0.36 ditto
7. 0.30 Orange-brown sand, almost stone-free.
8. 0.26 ditto
9. 0.50 Dark brown silty sand with sub-angular stones up to 200mm long. Not bottomed. Archaeological feature? Possibly top of enclosure ditch.
10. 0.57 Mid-brown silty sand with occasional gravel. Not bottomed. Archaeological feature? Possibly top of enclosure ditch.
11. 0.37 Dark brown silty sand with numerous small stones up to 200mm long and one fractured (burnt?) pebble. Not bottomed.
12. 0.38 Light brown silty sand with scattered small stones and fractured burnt stone on the interface with the topsoil.
13. 0.45 Yellow-brown sand, almost stone-free.
14. 0.38 ditto
15. 0.38 Stony horizon, stones *c*. 200mm long. Not bottomed. Ditch fill?
16. 0.31 Buff-brown sand, almost stone-free.
17. 0.35 Yellow-brown sand, almost stone-free.

The soil-pitting was quite informative when plotted in relation the geophysical survey (Fig. 7). The majority of pits came directly to gravelly sandy subsoil, showing a ploughsoil *c*. 0.3-0.4m deep. The soft subsoil explains the depth of ploughsoil. I a few places the pits coincided with probable archaeological features. Pit 4 was over a charcoal-rich layer, probably ditch-fill. The topsoil in Pit 9 was also deeper than average and above a deeper feature which by its position in relation to the survey was bank fill or old land surface remnant. Pit 10 was even deeper and was over the inner enclosure ditch. Pit 11 was situated within the interior of the enclosure and was over a feature with dark fill and probable burnt stone. Pit 12 was within the area of the possible outer entrance and also produced a burnt stone. Of the remainder of the soil pits only 15 was above a possible feature although this seemed likely to be associated with the nearby post-medieval quarry.

4.1.4 Discussion

The depth of the ploughsoil results from the soft subsoil, which has been cut into over a long period, reducing the upstanding remains. It might be expected therefore that there has been severe erosion. However, the geophysical survey indicates that there are extensive remains and it seems that the deep soil must now provide a buffer against further erosion. The site therefore has considerable archaeological potential.

The geophysical survey has produced excellent results and shows that the darker patches seen on the aerial photograph are the sites of roundhouses. The whole of the interior shows many anomalies that cannot be properly interpreted without excavation but it is possible that the small patchy anomalies within the spread of noise (20) are pits of some kind. There is also a hint of a sub-enclosure around the large roundhouse 11. The possible palisade slot 21 turns in towards the possible inner entrance. There are also traces of a similar sinuous feature around the inside of the west side of the inner enclosure. The possible entrances are on the east side, a typical direction for both enclosure and house entrances and are oriented slightly down slope. On this side is a low valley with several springs where water could be obtained.

The survey has provided exceptionally good detail of the enclosure from which it is possible to say that it had at least two phases since three houses are built over the ditch of the inner rampart and slightly cut into the rampart. This shows that at some point the inner rampart was disused. The settlement may have simply expanded and been incorporated within a larger ringwork but it seems more likely that during one phase this was a bivallate enclosure. It is not possible to be certain of the order of phasing from the geophysical survey and it is possible that there were houses there before the construction of the enclosure banks as at Castell Odo, which began as an unenclosed, undefended settlement. The overall similarities with Castell Odo (Fig. 2) are striking and there the final phase of occupation was believed to have been in the Roman period after demolition of the entrance and with houses built over the levelled banks (Alcock, 1960). However, there was no artefactual evidence to date this last period. At Bryn Rhydd there as also some evidence for a late phase postdating the defences. The apparent slight discontinuity in the line of the outer ditch at the north-north-east coincides with a possible small rectangular enclosure that crosses the lie of the ditch and intrudes into the area of the rampart. The size and shape of this rectangular feature suggests that it was a rectangular platform house, terraced into the rampart. However, at Castell Odo a medieval pillow mound for rabbit farming was built within the enclosure and the feature at Bryn Rhydd could be similar.

4.2 CONION, RHIW, GWYNEDD (PRN 1207)

4.2.1 Introduction

This is a sub-circular enclosure about 85m diameter overall, on a slight hill-slope promontory at 185m OD on a slight spur at the west side of the higher slopes of Mynydd Rhiw (Fig. 8). The western side therefore has no natural defences, but would look quite prominent from the east, down slope. It has some well-preserved features including the entrance approached by a hollow trackway from further down slope but much of it has been modified by medieval or post-medieval agricultural re-use and clearance stone dumping. It is sub-circular in plan with two concentric stone-built banks (Fig. 9). It is uncertain whether the outer enclosure bank is truly part of the defences or is just the addition of enclosed areas for agriculture, possibly related to extensive platform huts and terraced fields in the area (Fig. 9b). One small sub-rectangular enclosure outside the inner bank at the north-east is rectangular, probably terraced, with low enclosing banks and may be is a platform house. The inner enclosure has been modified for use as a small field by insertion of two straight banks to form an approximately rectangular field.

4.2.2 Geophysical survey results (Figs 10-11)

D. Hopewell

Survey conditions

The site was visible as an area of banks and loose stone with rock outcrops at the south. The southern part was overgrown with gorse and was not suitable for survey. Gorse bushes were also dotted around the survey area. Initial scanning showed the bedrock to be very magnetic (1000nT or more). The general area was found to be magnetically noisy and finding a ‘zero point’, that is, an area of even responses to align the sensors on the gradiometer was difficult. It was decided to carry out a trial survey even though it was clear that parts of the site were dominated by strong geomagnetic signals. The test showed surprisingly clear results at the north of the site so the whole area was surveyed. The traverse speed was greatly reduced in order to allow the gradiometer to be carried over banks, stone spreads and gorse bushes. This will inevitably have introduced some random data into the survey data but the majority of the readings were taken accurately. The data was processed using a high pass filter in order to remove the effects of the weaker areas of geomagnetism. Stronger areas, visible as solid black or white on the greyscale plot could not be compensated for.

Results

The earliest features detected in the survey are a series of concentric anomalies that are, for the most part, not visible on the ground. Anomalies 1 and 2 are best interpreted as ditches. Ditch 1 is much clearer than ditch 2. This could be a result of 1 being deeper or wider or perhaps an indication of different fills. The depth of overburden is probably not significant as both ditches are in the ploughed part of the field at the north-west. The relatively quiet areas between the ditches appear to indicate banks. The outer (3) corresponds to the end of a surviving earthwork. The inner (4) is visible in places as a magnetic anomaly. A further stone bank (5) is visible as a scatter of small random anomalies and survives as a low earthwork. This is parallel to the early features and may therefore be associated with them but its survival amongst later banks 1 – 4, suggest that it could be a later or perhaps a result of dumping on an earlier feature.

There are several later anomalies that are mostly visible as earthworks. The relationship between these is unclear. Anomaly 7 is visible on the ground as a ploughed out field boundary and feature 8 seems to be similar. Feature 6 is parallel to the ditches but follows a slightly different alignment, perhaps representing a later use of a still-visible feature. There are two rectangular anomalies, 9 and 10, probably representing enclosures. One side of 9 incorporates the outer bank of the circular enclosure so it seems likely that both features were upstanding at the same time, presumably before the circular ditches and banks were ploughed flat. Further linear anomalies 11 and 12 cannot be assigned to any period. A narrow linear anomaly (13) appears to indicate the line of a water pipe feeding a trough (14). The areas of black and white responses at the south and east of the survey (15 and 16) are the result of magnetic interference from bedrock close to the surface.

4.2.3 Soil survey results

The locations of the pits are shown on Fig. 12.

Table 2 Conion soil pit data

1. 0.24 Orange-brown silt. In open field.
2. 0.29 ditto.
3. 0.40 ditto. Possible soil accumulation at edge of ploughed field.
4. 0.20 Rubble. In open field.
5. 0.15 Rubble. Within site boundary.
6. 0.30 Orange-brown silt with scattered stones. In open field.
7. Stony bank at surface.
8. 0.27 Rubble in red-brown silty loam. Just inside enclosure bank.
9. Rock outcrop.
10. Stony bank.
11. 0.21 Stone slab

The soil pitting information was limited by the small size of the enclosure and by thin soil cover over bedrock within it. However, outside the enclosure (Pits 1, 2, 3 and 6) there was a reasonable soil cover above silty subsoil and this explains the medieval and post-medieval agricultural use. Pits 4, 5 and 8 revealed stone rubble, possibly tumble. Pits 7 and 10 were over the stony banks of the enclosure and pit 9 was on the outcropping bedrock.

4.2.4 Discussion

The concentric layout was regarded by the RCAHMW as sufficiently distinctive to include it with the other 'Weak double ringworks' in the area although the small size of the enclosure and its banks and the poor defensive position made it a possibility that this was just an enclosed settlement. It was quite surprising then, when the geophysical survey revealed that there were originally two closely-set, neatly concentric ditches with traces of their banks although the lines of the latter had been somewhat obscured by later features. The smaller enclosure seems to have been a later addition. Feature 7 at the north-west sad of the survey area is one end of a medieval strip field system, traces of which can be seen in aerial photographs and probably associated with the rectangular enclosures and platform house modification off the defended enclosure.

The geophysical survey showed no evidence of houses within the interior of the enclosure because of the shallow soil cover over bedrock, which outcrops on the south-east side and by interference from an iron water pipe, crossing the site. Excavation of the trench for this pipe in 1960 was monitored, and uncovered a rotary quern fragment, a stone rubber, a post-hole and probable occupation deposits (GAT file).

The original bivallate enclosure ditches suggest that the RCAHMW was right in including this site in the same class a Castell Odo, although it is smaller. It therefore has greater value than if it was simply an Iron Age/Romano-British enclosed settlement. It therefore deserves recognition although it is not in the best condition because of modification and dumping. The rocky nature of the inner enclosure means that it will be likely to remain as marginal land, secure from clearance or ploughing. However, some stones resulting from cultivation of the field to the north have been dumped onto the area of the outer enclosure banks and ditches and this could continue to obscure the site.

4.3 MEILLIONYDD DEFENDED ENCLOSURE, ABERDARON, GWYNEDD (PRN 1205)

4.3.1 Introduction

This is an oval bivallate hilltop enclosure about 105m by 85m overall, now much ploughed down and barely traceable on the ground. It lies on a broad gently rounded hill at 190m OD that forms a spur projecting westwards from the higher slopes of Mynydd Rhiw (Figs 13-14). The condition of the earthworks shows that the field has been well-used for arable in the past. It also suggests that these were earthen banks and now spread to *c*. 10m wide and 0.3m high. A Post-medieval field boundary follows the outer bank at the SW and part of it has also been eroded by a track. A modern field boundary that used to cross the site, marked on the 1972 map, has now been removed and remains as only a very slight ridge. There is a slight discontinuity in the outer bank at the north-east, which may indicate an entrance. There is also a slight platform or scoop in the interior at the south-east, just inside the inner rampart, which could be a house platform. The defensive banks are set quite closely and in this the site closely resembles Castell Odo and so was included in the same class by the RCAHMW.

4.3.2 Geophysical survey results (Figs 15-16)

D. Hopewell

Survey conditions

Conditions were generally good. The field was under pasture and there were no obstacles. Scanning suggested that background noise levels were high, particularly around the monument itself. An acceptable zero reference point was located to the east of the survey area.

Results

This site is notable for the strength of the anomalies encountered. A typical archaeological site, defined by variations in the soil will exhibit responses of +/- 15nT and many anomalies are defined by variations of +/- 5nT or less. Responses at Meillionydd were typically in the order +/- 20nT with large areas exhibiting very frequent peaks of +/-50 to 3000nT. This order of responses is most commonly produced by ferrous material or igneous bedrock. Soil test pits revealed concentrations of burnt stone. The local geology is also principally igneous and field stone appeared to be iron-rich. It seems likely therefore that the unusually strong anomalies are a result of naturally magnetic field stone enhanced by burning. The interpretation of the anomalies is somewhat problematic as the principal detected element appears to be concentrations of stone as opposed to soil variations on a more usual site.

A measured ground survey was carried out and this is superimposed on Fig. 16 in red. This has been used along with comparison to the results from Conion and Bryn Rhydd to enhance the interpretation of the geophysical survey.

The clearest anomalies are a series three concentric features (1, 2 and 3) that are particularly well defined at the north of the site. They can still be traced at the south but are masked by an area of high readings.

Two relatively quiet areas (4 and 5) running inside anomalies 1 and 3 can almost certainly be interpreted as ramparts. The inner is similar to the rampart at Conion, that is, an area of quiet responses between a ditch and the activity within the enclosure. This also corresponds to the surviving earthworks. Features 1 and 3 can therefore be interpreted as ditches. Feature 2 is similar and could be another ditch, either a quarry for the bank or possibly belonging to a separate phase to 1 and 3. The outer ditch forms an enclosure close to circular in plan with dimensions of 100m north to south and 90m east to west. There is a 7m wide gap between the inner and outer ditches with the possible third ditch (2) running mid-way between the two. There is no clear entrance. A break in the earthwork at the north-east does not correspond to a break in the geophysical anomalies and thus is probably later disturbance. There is another low area in the earthwork on the east that corresponds to a possible discontinuity in the geophysical anomalies (6). This could be an entrance but the results are far from conclusive. It should also be noted that the area of noisy responses around the southern and western part of the defences could mask an entrance.

The inner rampart (5) is 5m wide and an area of activity runs around its inner edge. Three patches of enhanced responses, 7, 8 and 9, are particularly noticeable. Area 7 contains three 6m wide roughly circular anomalies that could correspond to roundhouses; a further possible house can be seen in area 8. A further area of activity (10) can be seen in the centre of the enclosure but this cannot be resolved into an identifiable feature.

The survey area is criss-crossed by later drains and boundaries. These are indicated by broken black lines on the interpretation plan.

4.3.3 Soil survey results
The locations of the soil pits are shown on Fig. 17.

Table 3 Meillionydd soil pit data

1. 0.25 Friable mid orange-yellow silty clay with small angular stones and gravel
2. 0.25 Hard greyish-yellow silty gravel with frequent stones up to 70mm long.
3. 0.26 Mid brownish orange silty clay with small stones
4. 0.28 Gradual change to orange-brown soil at –0.30, not subsoil clean silty clay with humus. Not subsoil. Probable archaeological horizon. Bank/ditch?
5. 0.28 Occasional burnt stones in topsoil, uniform down to yellow sandy silt subsoil, hard and relatively stone-free.
6. 0.39 Yellow-brown clayey silt with occasional small stones.

7. 0.16 Soft friable yellow-orange silt with frequent stones. Somewhat mottled with humus and has numerous worms. Possibly redeposited horizon? Continues the same for at least another 0.10
8. 0.20 Well-packed stones average 0.10m long, not burnt and in a matrix of loam.
9. 0.30 Yellow sandy gravel with rounded stones about 70mm long
10. 0.16 Stony topsoil onto tightly packed stones at least 200mm long. Could be an archaeological or natural horizon.
11. 0.25 Dark brown gravely silt with 85% stones including fractured burnt stones. Not bottomed.
12. 0.43 Orange silty with gravel.
13. 0.24 Orange silt with 60% gravel and stones up to 100mm long.
14. 0.29 ditto, including some burnt stone.
15. 0.22 Orange silt with and gravel.
16. 0.22 Dark brown gravely silt with well-set sub angular stones *c*. 150mm long. Probable archaeological horizon. Bank?
17. 0.32 Dark brown silt with occasional stones up to 150mm long. Probable archaeological horizon. No burnt stone.
18. 0.33 As 12.
19. 0.25 Yellow-buff silt with 60% gravel and small stones.
20. 0.31 As 12.

The soil survey showed that in some areas the soil cover on the summit of the hill was thin and depleted with as little as 0.16m. Elsewhere the more typical soil depth was between 0.25-0.30m. The deepest area of soil was on the lower, level ground to the east where it was about 0.40m. Several soil pits came down onto archaeological horizons of either ditch silt, bank fill over the circuit of the enclosure banks. Only pit 11 happened to be over a specific the activity area identified by the geophysical survey. From this the pit appeared to be within the area of one of the roundhouses and came down to a layer of organic silt and burnt stones. However, pits 8, 10 and 14 were also within the enclosure and all three came down to layers that were not natural subsoil.

4.3.4 Discussion

The geophysical survey produced good results despite the expectation of problems from the igneous bedrock of the area. This was explained by the soil survey which showed that the subsoil was fluvio-glacial sandy gravel. The two banks and ditches showed up well with the addition of a possible third bank and ditch. This feature was also shown up by the rapid topographic survey that was carried out at the same time. The inner rampart appears to have been about 4m wide and shows up particularly well as it is partly defined by a band of intense activity within the enclosure that includes at least three roundhouses. The southernmost roundhouse coincides with the platform/scoop previously noted. A gap between two of the probable roundhouses also coincides with a possible entrance shown by the geophysical survey. Another discontinuity in the outer rampart at the north-east, previously noted during the defended enclosure survey (Fig. 14) as a possible entrance was refuted by the geophysical survey, which showed no break in the circuit of the ditch at this point.

Overall the combination of geophysical, topographic and soil survey has produce quite a detailed picture of the nature and condition of this formerly very enigmatic site. There is no evidence of multiple phases of construction as seen at Castell Odo and Bryn Rhydd as no houses or defences overlap. Burnt stones were identified in one of the pits over a probable roundhouse and the presence of such stones might explain the good geophysical indications of activity. It might also suggest an earlier first millennium date than later as use of heated stones would be more typical of an earlier date.

In terms of condition and risk assessment the survey shows that despite prolonged ploughing much still remains of the earthworks and of internal features. The greatest plough attrition seems to have been at the west where the topsoil cover is so thin that any ploughing will inevitably cut into subsoil and any preserved horizons or subsoil features. Elsewhere there is a more normal depth of soil cover and this provides some protection from ploughing, partly because the spread of the earthworks themselves has provided some additional cover.

4.4 CASTELL CAERON, RHIW, GWYNEDD (PRN 1234)

4.4.1 Introduction

This is a small bivallate, lightly defended enclosure on a hill slope promontory and has closely-set walled defences. It is oval in plan, about 75m by 65m internally and 95m by 80m overall (Figs 18-19). It lies on a slight spur at 190m OD on the north side of the much higher slopes of Mynydd Rhiw and only 2km from Conion and Meillionydd, described above. The promontory has steep natural crags on the north-west but the ground rises slightly to the south so is not in a strong defensive position overall.

The best-preserved part of the defences is on the steeper slopes at the west where they are of exposed and spread stone rubble with some traces of facing on the inner enclosure wall at the west side. The closeness of the two ramparts is distinctive and the reason why it was included in the same class as Castell Odo by the RCAHMW. Also, the enclosure walls were never very massive structures. There is a narrow break and in turn in both the ramparts at the west side, presumably indicating an entrance there, designed to make approach difficult as this side has a steep slope but there are traces of a terraced track approaching diagonally along the slope. There is also a distinct in turn in the inner rampart at the north-east side and it is possible that the real entrance was there, destroyed by building activities associated with the house there.

4.4.2 Geophysical survey results (Figs 20-21)

D. Hopewell

Survey conditions

A roughly rectangular field within the ramparts was the only area suitable for survey. This was somewhat overgrown at the north, containing several large gorse bushes. These were avoided by using a very slow traverse speed and carrying the gradiometer round or over the obstacles. Some additional noise, therefore, occurs in this area of the survey.

Results
The results were fairly quiet with a slight change (1) running diagonally across the field. The northern area was slightly noisier. This either corresponds to an old boundary or a change in the natural substrate. A very faint anomaly (2) runs just to the north of this, apparently corresponding to an in-turn in the earthworks shown on the OS plan. This may indicate a smaller enclosure within the main ramparts. A faint anomaly (3) at the south indicates the line at the main rampart.

All of the other anomalies detected seem to be a result of modern cultivation. Anomaly 4 indicates that the field was formerly divided into two. Plough scarring (5) occurs on the south-western side of the division.

4.4.3 Soil survey results
The locations of the soil pits are shown on Fig. 22.

Table 4 Castell Caeron soil pit data

1. 0.47 Mid-brown silt with scattered stones and wall tumble up to 200mm long. Not bottomed.
2. 0.26 Orange clayey silt with 80% rounded gravel.
3. 0.30 As 2.
4. 0.18 As 2.
5. 0.20 Orange silt with 20% sub rounded gravel. In negative lynchet cut about 0.35 into slope below inner rampart.
6. 0.26 As 2.

This was small area with only six soil pits and clearly much disturbed by post-medieval activity. There was relatively little soil cover in the interior with between 0.18 to 0.30m depth of topsoil. The most interesting was pit 1 just behind the inner rampart and this was not bottomed at -0.47m over a deposit of humic silt and stones. This indicates some protection from the eroded rampart and therefore some possibility of preservation around the edges of the inner enclosure. The field comprising the interior of the fort is presently overgrown disused pasture and it seems unlikely that it will ever be cultivated again.

4.4.4 Discussion
The interior is mostly quite level and is divided by post-medieval field walls to create a small field adjoining a cottage. The northern part is hummocky and is reported to have had well in it, although not marked on earlier OS maps. The southern part of the interior has been cleared and used for arable, probably as a potato field, but is now disused. The geophysical results were confined mainly to the interior because the stony ramparts would not have been productive and dropped off steeply at the west. A small part of the outer rampart and possible ditch was surveyed at the south-east, where it lay within a grassy paddock but did no more than confirm its line. The results in the interior were quite good despite the rocky nature of the promontory but did not reveal any obvious features, such as roundhouses even in the northern part of the interior, which appears not to have been ploughed and where good preservation would be expected. However, the walkover revealed a small oval scoop or platform about 7m by 6m just within the inner bank at the north-west side which could be a house (Fig. 22). The geophysical survey was unable to cover most of the equivalent area

elsewhere, immediately within the inner enclosure bank because of the presence of post-medieval walls and fences where houses might have been most likely to occur.

4.5 Y WERTHYR HILLFORT, LLANTRISANT, ANGLESEY (PRN 2077)

4.5.1 Introduction

This is a sub-circular bivallate hillfort now largely ploughed down, difficult to trace on the ground and best visible as a crop-mark. The internal enclosure is sub-circular and about 80m diameter internally. The fort overall is oval and about 200m by 180m. It lies on a low rounded hill at 60m OD, part of a longer ridge but with extensive views over lower land to the west (Fig 23). There is a gap marking a probable wide entrance at the north-east and there is a marked hollow linear feature swinging around the earthworks at the south, which was thought during the original field visit to be either a trackway or a third line of defences. The eastern part of the inner enclosure forms a distinct scoop-like terrace, just below the actual summit.

There have been no chance finds to indicate a date but it has been compared to the LBA/EIA site of Castell Odo (Alcock 1960, Lynch 1991, 268) and so was a useful inclusion in the present project. A trial geophysical survey was carried out here in 2005 when a strip 60m by 120m was surveyed across the centre of the enclosure (Hopewell 2004). Surprisingly, despite the negligible surface remains, good evidence was found for the inner defences, entrance and several roundhouses.

In addition, in 2006 a new aerial survey of the site by Dafydd Roberts and John Rowlands produced excellent results from a combination of low light and drought conditions (Fig. 24). This shows very clearly the layout of the whole earthworks and shows the possible presence of an annexe or evidence of a separate phase of earthworks at the north.

4.5.2 Geophysical survey results (Figs 26-27)

D. Hopewell

Survey conditions

This site was first investigated in the 2005-6 phase of the current project. A rectangular area in the centre of the enclosure with dimensions of 60m x 120m was surveyed using a Geoscan FM36 gradiometer. Recent aerial photographic evidence produced by John Rowlands in 2006 (Fig. 24) suggests that the site is more extensive than was previously thought with a possible annexe on the north side. Further survey was carried out, extending the area to a maximum of 180m x 180m.
The current survey was carried out using a Bartington Grad601-2. The original grid could not be located so the survey areas were overlapped. The results from the two surveys were not directly compatible in the geophysical survey processing software but could be successfully combined using *Adobe Photoshop* and *Illustrator.* A sketch topographic survey was made of the earthworks using the geophysics grid to locate the features; this is included as a separate plot (Fig. 25)
The survey was hampered by gales, heavy rain and waterlogged ground. This had little effect on data quality but slowed the survey down considerably. Background

noise levels were fairly low and archaeological features were visible as clear anomalies.

Results

The site is characterised by a series of clearly defined curvilinear anomalies best interpreted as ditches. These correspond fairly closely to hollows in the earthwork on the ground; minor variations are explained by the spreading of upstanding features such as banks as a result of ploughing. The outer ditch is visible as a clear 5.5m wide anomaly with a 13.5m wide entrance (5) on the eastern side. The ditch encloses a sub-oval area with dimensions of 197m x 161m. A second ditch (2) runs between 6m and 19m to the inside of this. Ditch 2 does not continue on the same alignment on the north side of the entrance. The line of the ditches is cut by the modern field boundary on the west making definite interpretation difficult. It seems likely that ditch 2 continues (as 4) along the western side of the hill before turning sharply back on itself to form an annexe at the north of the site. A third ditch (3) forms a roughly circular enclosure with a diameter of around 100m on the top of the hill. The inner two ditches (2, 3 and 4) both have anomalies (6, 7 and 8) running alongside their inner edges that almost certainly correspond to ramparts. This is less evident on the outer ditch although there are hints of a rampart close to the entrance (9) and possibly at the south of the survey. The ramparts are quite well defined and in places, such as the west part of the inner enclosure produce, strong magnetic anomalies. This may be the result of burning. A large area of responses (10) similar to those produced by the rampart can be seen just to the north of the entrance. This may represent more substantial defences around the entrance. A corresponding thickening of rampart 6 can be seen on the southern side. There are hints of a second alignment of defences to the north of the entrance (11) indicating that more than one phase of construction may be present.

The interior of the circular inner enclosure is noisier than the surrounding area. This is probably the result of magnetic enhancement from domestic activity such as fires. Several patches of further enhancement, (12) indicated in grey on the interpretation plan, could indicate the site of roundhouses. These seem to have a typical diameter of 10 to 13m. Another patch of enhancement (13) containing possible houses is present within the annexe enclosed by ditch 4.

4.5.3 Discussion

No soil survey was carried out because the large area of geophysical survey required all the available resources.

The new geophysical survey was accompanied by a rapid topographic survey using the geophysics grid and this helped a good deal in interpreting the subsequent results (Fig. 25). The original survey area was extended to cover most of the area of the earthworks, doubling the area originally surveyed. The field had been ploughed and reseeded again since the original visit and the earthworks were clearly somewhat more reduced and harder to interpret. The additional survey provided much better understanding of the site, demonstrating the complicated and multiple nature of the defences, indicating several phases of development. It also showed that the ‘annexe’ to the north was possibly an extension of settlement area outside the internal enclosure. It also showed that the inner entrance was flanked by complicated earthworks, indicating changes in design.

The aerial photograph and the geophysical survey show that this was a quite strongly defended multivallate fort with a long history of modification. Its strength makes it rather more different from Castell Odo and the other Llŷn sites than seems on the ground. Its defences are not fully concentric, it is asymmetric in shape and its entrance is large and possibly elaborate. This suggests a later, 'developed' type of hillfort more likely to have been a central place in the prosperous and well-settled landscape of Late Iron Age Anglesey. There are relatively few defended sites on Anglesey from this period and they are noticeably well-spaced out, which might indicate territories (Fig. 1). Such a strongly defended settlement could well have been one that was reduced during the Roman invasion and the geophysical survey suggested that the very strong responses from certain parts of the ramparts might result from areas of burning.

There is still a possibility that the fort had early origins and the inner, sub-circular enclosure is quite similar in diameter to the overall size of Castell Odo, Meillionydd, Bryn Rhydd and Conion, i.e. about 80-90m. An earlier second concentric bank and ditch could have been masked by later re-cutting of the ditch to enhance the defences.

The recent photograph (Fig. 24) also shows remnants of possible strip fields running at an angle to the modern boundaries.

4.6 WERTHYR, BRYNGWRAN, ANGLESEY (PRN 3505, SAM A42)

4.6.1 Introduction

This scheduled site is a large oval defended enclosure about 190m by 140m, first recorded by the RCAHMW (1937) (Fig. 29). It consists of three closely set banks around the summit of a very low and inconspicuous hill at 45m OD (Fig. 28). The hill overlooks the Afon Carrog and is surrounded on three sides by marshy lowland. The only visible features are the ramparts although even these are well ploughed down. A minor road crosses the enclosure replacing an earlier road that curved around the inside of the outer rampart. A small excavation was carried out in the area of the defences at the west when this new road was built but no useful evidence was found. However, a bronze terret chariot fitting probably of the Romano-British period was found (Livens 1976). The closeness of the ramparts gives the site a similarity with the sites in Llŷn described above, although this one is larger and oval, rather than sub-circular in plan.

4.6.2 Geophysical survey results (Figs 31-32)

D. Hopewell

Survey Conditions

Two areas separated by a wire fence were surveyed in open sloping fields. Background noise levels were moderate apart on the top of the hill where noise levels were high probably as a result of bedrock being close to the surface.

Results

Two parallel 5m-wide negative anomalies (1 and 2) indicate the line of the ramparts and delineate a roughly oval enclosure with external dimensions of 150m x 200m. A line of small anomalies running along the centre of the inner could indicate the presence of timber elements. Negative anomalies on the outside (3 and 4) of the ramparts indicate the presence of ditches although these are not well defined apart from at the very north of the survey. This is probably a result of the ramparts having eroded over the top of the ditches. A somewhat variable, linear anomaly runs about 5m to the inside of the rampart 2. At the north and east of the site this consists of two narrow, parallel anomalies, at the south a single narrow anomaly and at the north-east a broad area of noise. The eastern and north-eastern parts correspond to a rounded bank on the ground suggesting the presence of a third line of defences. The parallel anomalies may indicate slots that once held timbers suggesting the presence of a box rampart. This could represent either the original defences or a modification of the defences represented by ramparts 1 and 2. There is no clear entrance although a narrow break in the second rampart and the inner slot of the third corresponds to a low point on the visible earthworks (6). The break in the earthworks and geophysical anomalies is however more likely to be a result of erosion, given the narrowness of the break and apparent lack of entrance in the outer rampart or innermost slot.

A second enclosure or series of enclosures, defined by strong positive anomalies presumably corresponding to ditches, are visible on the higher ground at the west of the survey area. These are different in character to outer defences 1 to 4 and presumably belong to a different period of occupation. There appear to be two, or even three, phases present although it should be noted that the results are not particularly clear and several interpretations are possible. The most clearly defined part (7) is in the form of two sides of a rounded rectangle with dimensions of 80m x 50m. This either curves back as 8 to form a roughly rectangular enclosure or continues as 9 to form a larger enclosure with 10. The in turning ends of 7 and 10 would then indicate an entrance. Ditch 11 appears to belong to a separate phase. The interpretation of these features is complicated by the presence of a deep gully or hollow of unknown origin. According to the RCAHM plan (Fig. 29), that shows the site before the construction of the modern road, it would have cut the projected line of ditch 10. It is thus most likely to be a relatively modern feature, perhaps a small infilled quarry that will have removed elements of the enclosures. The soil is very thin on top of the hill with frequent rocky outcrops visible suggesting that the ditches may be cut into the bedrock in places.

There is little to indicate areas of occupation within the various enclosures. A scatter of possible thermo remnant anomalies along the inside of ramparts 1 and 2 on the east of the site could indicate hearths (12) but it is difficult to distinguish this type of anomaly from those produced by buried stones so this interpretation is not secure. The interior of the smaller enclosure or enclosures is very noisy (13-15). This may be, in part, a result of bedrock close to the surface. There noise is however most pronounced around the inside of the defences and this could be a result of magnetic enhancement produced by areas of occupation. Feature 16 is a modern land drain. A series of converging linear anomalies (17) are similar in appearance and are most likely to be another drainage feature

4.6.3 Discussion

No soil pitting was carried as this was a scheduled site and additional time spent on the geophysical survey of a larger area. The soil cover appeared to be quite thin on the summit of the hill and ground rock was visible in four places. The previous aerial photographs as well as new ones taken in 2006 (Fig. 30) showed the layout of the banks well but with no visible entrance or internal features. On the surface, the east side of the summit was somewhat irregular with some areas that could be house platforms. There was also a slight break in the inner bank at the north east that could have been an entrance. The latter was not confirmed by the geophysical survey but the possible area of house platforms coincided with areas of noise on the survey.

The most dramatic discovery from the geophysical survey was that there is a second, inner enclosure that had not previously been visible on the ground or on aerial photographs. This smaller enclosure seems clearly to have been of a different phase to the main outer defences as it is on quite a different, slightly angular ground plan and consists of a single bank and ditch. The fact that this had not been seen or suspected before shows the extent to which it has been completely levelled by ploughing. The survey shows the enclosure clearest on the north and east and here it follows the edge of a slight plateau on the hilltop and there is a slight break in slope at this point, but not one that would be recognised as suggesting a former earthwork. The ditch of this enclosure is likely to be at least partly rock-cut but the rampart is quite broad so was a bank rather than a wall. The survey indicates that there was more than one phase of this inner fort, and possibly it was extended. Its entrance seems to have been o the north side, marked by an in turn and gap in the defences.

The outer defences are quite different, with concentric, close-set banks and ditches on an oval plan. It seems likely that lower down the hill the ditches may have cut into fluvio-glacial material, and the earthworks have been lowered by ploughing. The depth of soil will also be deeper than on the hilltop. The outer defences may have more than one phase as the aerial photograph and the geophysical survey show three lines of banks at least around the east and it has been suggested from the geophysical survey that the inner of two original banks was replaced by another stronger defence further inside, or to create a stronger rampart spaced further out. However, excavation would be necessary to prove what the sequence was.

The entrance to the larger fort has not been identified. It is fairly clear that it is not on the eastern side, where the geophysical survey gives a complete view of the defences. There is slight break in the earthworks on the north side and possibly in the geophysical survey, but it seems to slight to be a main entrance and may not be genuine. The site lies on a slight promontory surrounded on three sides by marshy valleys. It can only be easily approached along the ridge from the south and it would be understandable for this to be the natural route to the fort. It is the route taken by the present road which may have crossed the fort by an existing entrance gap. This is supported by the way that, before the modern improvement the road ran directly towards the fort before swinging around the inside of the outer rampart (Fig. 29).

The outer defences survive as earthworks and are visible on aerial photographs but no internal features are visible. It was hoped that the geophysical survey might elucidate these but unfortunately they remain elusive. Houses might be expected immediately within the inner rampart of the main enclosure and there are faint indications of activity along the east side but no specific features. It is possible that ploughsoil has accumulated over this area, or that any structures were of timber, not stone walls. This would make sense in this lowland setting, although there is some field stone and there are outcrops not far away.

The survey does show clear areas of activity within the inner fort, particularly in a band just within the rampart but again no houses as such are definable. The better results here may be ascribed to the thinner soil on the hill top.

It is difficult to understand the site as a whole. The very closely set concentric ramparts of the larger fort seem best understood as the earlier defence, with parallels with the Llŷn forts, that this was later strengthened by perhaps re-cutting and rebuilding the defences. The inner fort seems likely to be a later addition, perhaps a Romano-British or even medieval construction. It was a compact but strongly fortified and intensively occupied fort. The name Werthyr occurs four times on Anglesey in relation to early enclosures and means ‘place where things are sold’ and perhaps just refers to the resemblance to a cattle market ring.

5. DISCUSSION

Overall, the survey has produced useful results in all cases, but much more dramatic in some than others. In our area, with igneous rocks frequent and walled forts on rocky hills common only some sites are on soils or subsoils that will produce good geophysical results. It is mainly sites within cultivated land over soft subsoils that are suitable for survey.

The soil pitting has also been useful and has confirmed the expected variations in soil cover over hill tops and lower slopes and shown the vulnerability of features to plough erosion. It also helps considerably in interpreting the geophysics results, where for instance results decline a soil cover increases or where stronger signals are due to the presence of burnt stones.

Four of the sites studied are within areas of active if not annual cultivation for maintenance of pasture and only one of these, Werthyr, Bryngwran, is protected. All four sites have considerable surviving remains and are at risk from further ploughing and any deep ploughing could destroy all internal features. Shallow cultivation by rotavation is a modern technique and would be very welcome on these sites.

Table 5 Comparison of form of surveyed forts with forts elsewhere

Name	***Phase***	***Shape***	***Defences***	***Size***
Bryn Rhydd, Llŷn		Sub-circular	Bivallate	95m diam. overall
Conion, Llŷn		Sub-circular	Bivallate	85m diam. overall
Meillionydd, Llŷn		Oval	Bivallate	105m by 85m overall
Castell Caeron, Llŷn		Oval	Bivallate	95m by 80m overall
Werthyr, Llantrisant, Anglesey	Outer	Oval	Bivallate	200 by 180m overall
Werthyr, Llantrisant, Anglesey	Inner	Sub-circular	Univallate	80m diam. overall

Werthyr, Bryngwran, Anglesey	Outer	Oval	Bi/Trivallate	190 by 140m overall
Werthyr, Bryngwran, Anglesey	Inner	Oval	Univallate	90 by 70m overall
Castell Odo, Llŷn		Sub-circular	Bivallate	100m diam. overall
Moel Goedog, Anglesey		Sub-circular	Bivallate	98m diam. overall
Castle an Dinas, Cornwall		Sub-circular	Bivallate	85m diam. overall
Caer Bran, Cornwall		Sub-circular	Bivallate	130m diam. overall
Chun Castle, Cornwall		Sub-circular	Bivallate	85m diam. overall

The enclosures bear some close similarities to each other, as identified by the RCAHMW, but the plans of many other forts are determined mainly by the shape of the landscape in which they are built, whether hill tops or cliff promontories. It may be that only in situations where there is no landscape determinant that forts can assume a regular, designed lay-out. These will mostly be in lowland situations where the topography is gentler. A similar fort to these is that of Moel Goedog, Harlech (Meirionnydd), unexcavated and so undated (Bowen and Gresham 1967). It is in the upland at 380m OD but lies on a gently rounded hill and is sub-circular in plan, 98m diameter overall, with two quite small, closely-set concentric ramparts and a simple entrance. Very similar bivallate sub-circular forts exist in west Cornwall, such as Caer Bran, Castle-an-Dinas and Chun Castle. The latter was stone-built and the only one to be excavated showing it was occupied during the later Iron Age until about the time of the Roman conquest but was re-occupied and strongly refortified in about the 6th century AD (Leeds 1927). The lack of excavation of similar sites in Wales means that all interpretation must rely on comparisons with Castell Odo (Fig. 33). The similarities extend to shape – sub-circularity, size – in the range 80-100m diameter and close-set bivallation (Table 5). At Castell Odo the bivallation was not an initial part of the design as it appears that the inner rampart was added to an original univallate design. At Bryn Rhydd, however, it appears that either the enclosure was initially bivallate but became univallate when the inner rampart was demolished or it just had two univallate phases, the second larger than the first. Even on the present limited evidence then, the similarities in form of these enclosures do not necessarily mean contemporaneity but there does seem to be enough similarity to suggest a common tradition of building. On the other hand, there may be forts that have similar early origins to Castell Odo but appear dissimilar for the reasons of topography mentioned above. For instance, there are a few small, simple, lightly defended single banked or walled hilltop enclosures, particularly in Meirionnydd, that could be early defensive sites. Their form there may be dictated by the rocky nature of the landscape in which they were built, for instance Clogwyn Arllef, Llanbedr and Foel Caethle, Tywyn. No examples of these have yet been excavated and there are no chance finds to help date them so fieldwork is needed.

Field work is also needed to follow up the results provided here. Much could be achieved by testing sections of the ramparts and ditches of several forts, from which some idea of date and sequence might be obtained and possibly environmental information collected from soils beneath ramparts. Where there are or may be more than one phase, as at the two Werthyrs, research should try to identify the sequence. In future other techniques could be tried such as gridded surface collection after ploughing or gridded metal detecting. New techniques may also become available such as refinements of magnetometry – the larger sites here were surveyed at low resolution – or ground radar scanning.

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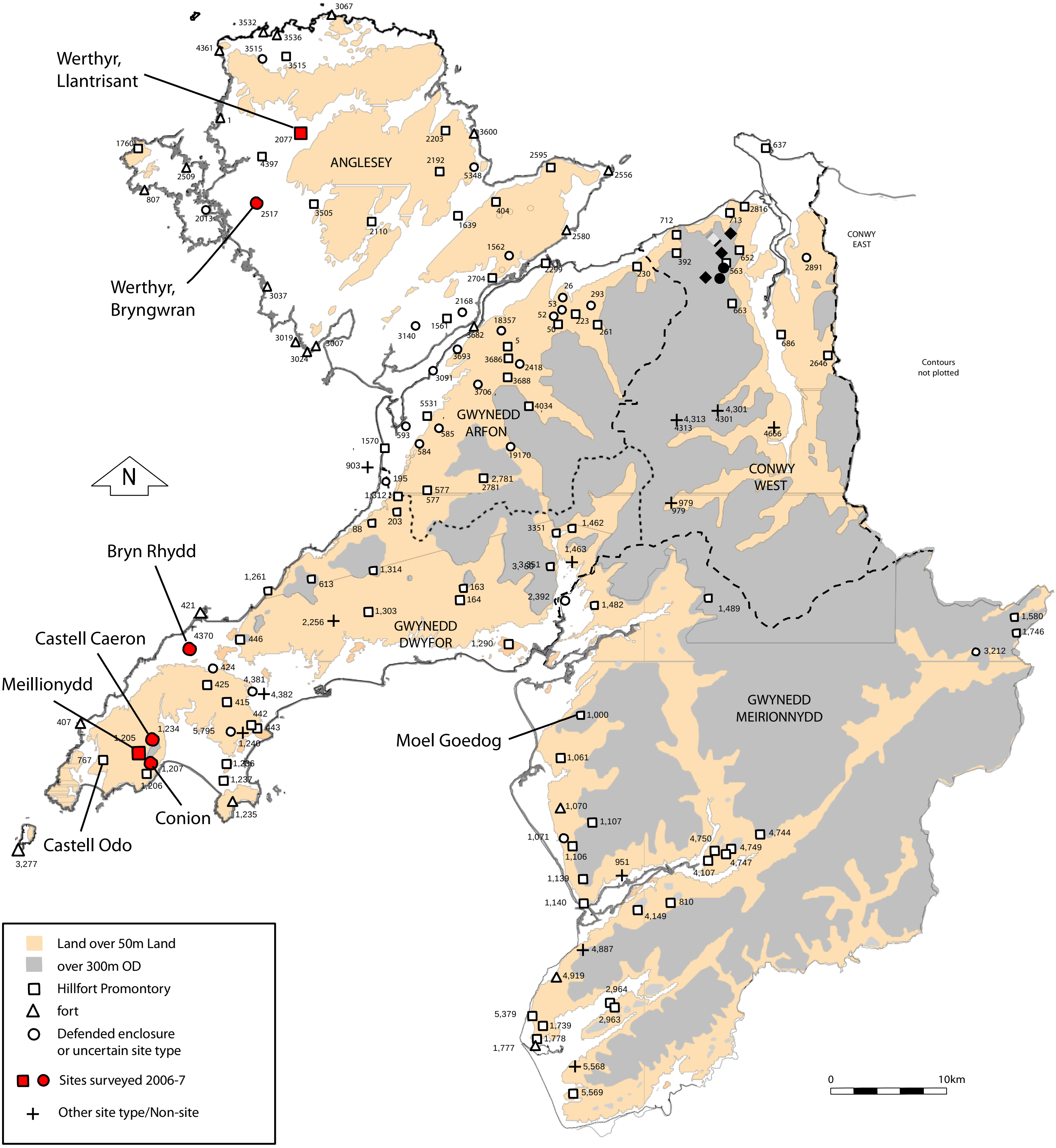

Fig. 1 The location of prehistoric defended settlements surveyed in 2006-7 in relation to all such sites known in north-west Wales

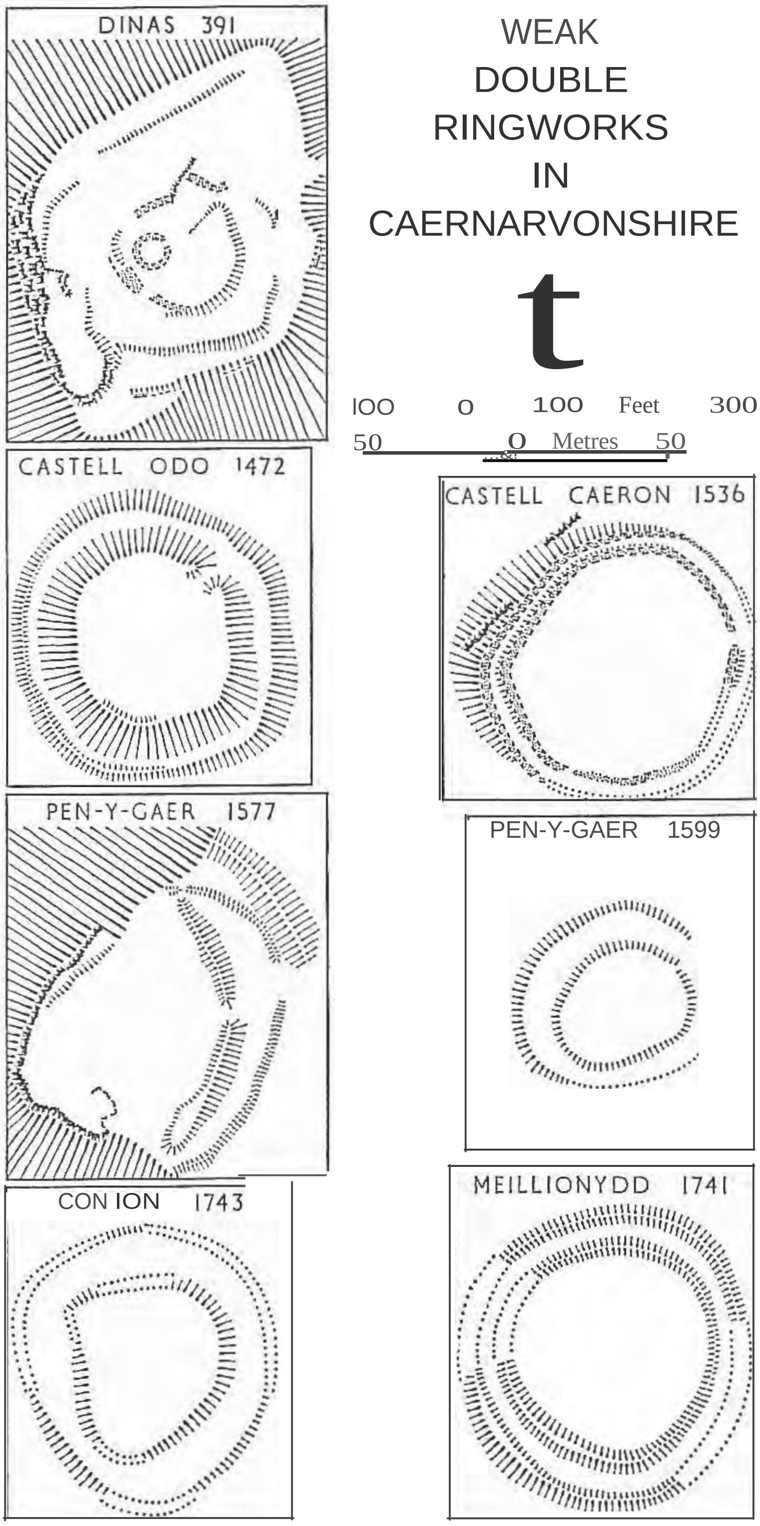

Fig. 2 Examples of hillforts classified as 'Weak double ringworks' by the RCAHMW (1964 fig. 17).

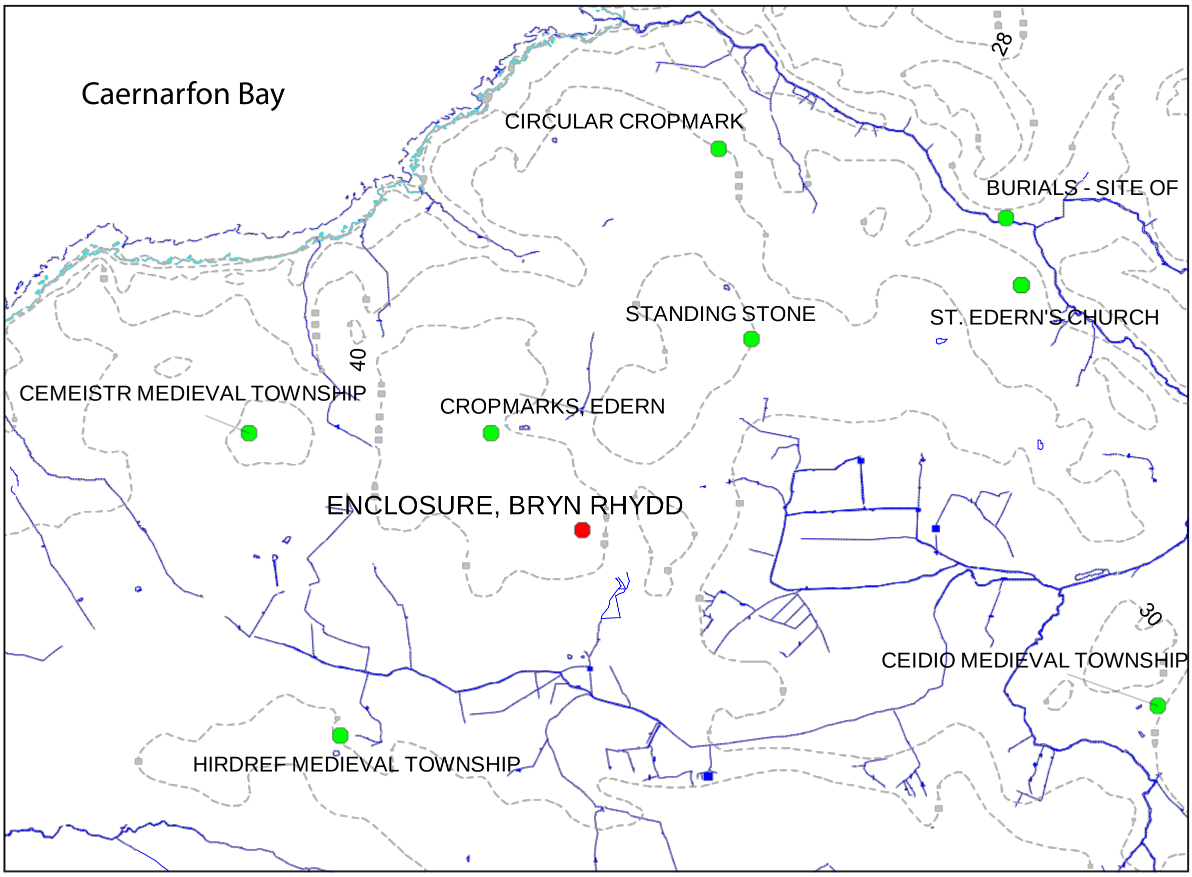

Fig. 3 Bryn Rhydd, Nefyn. Topographic location.
Scale 1:25000.

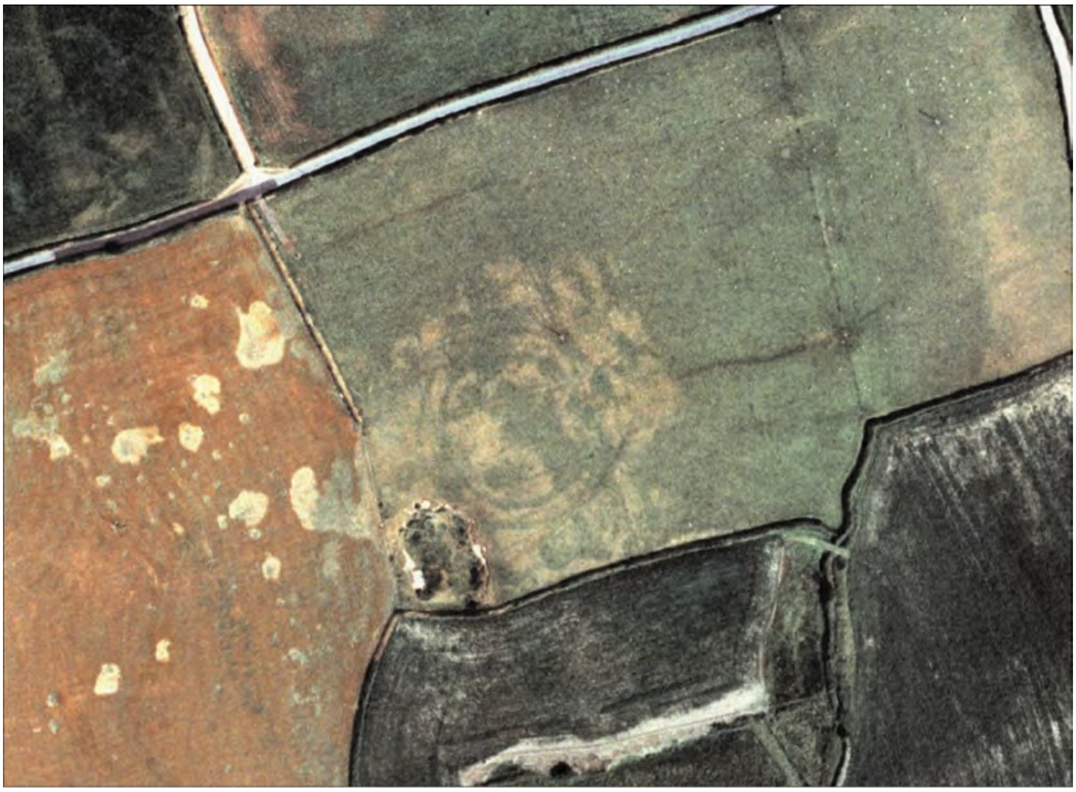

Fig. 4 Bryn Rhydd, Nefyn. Crop marks

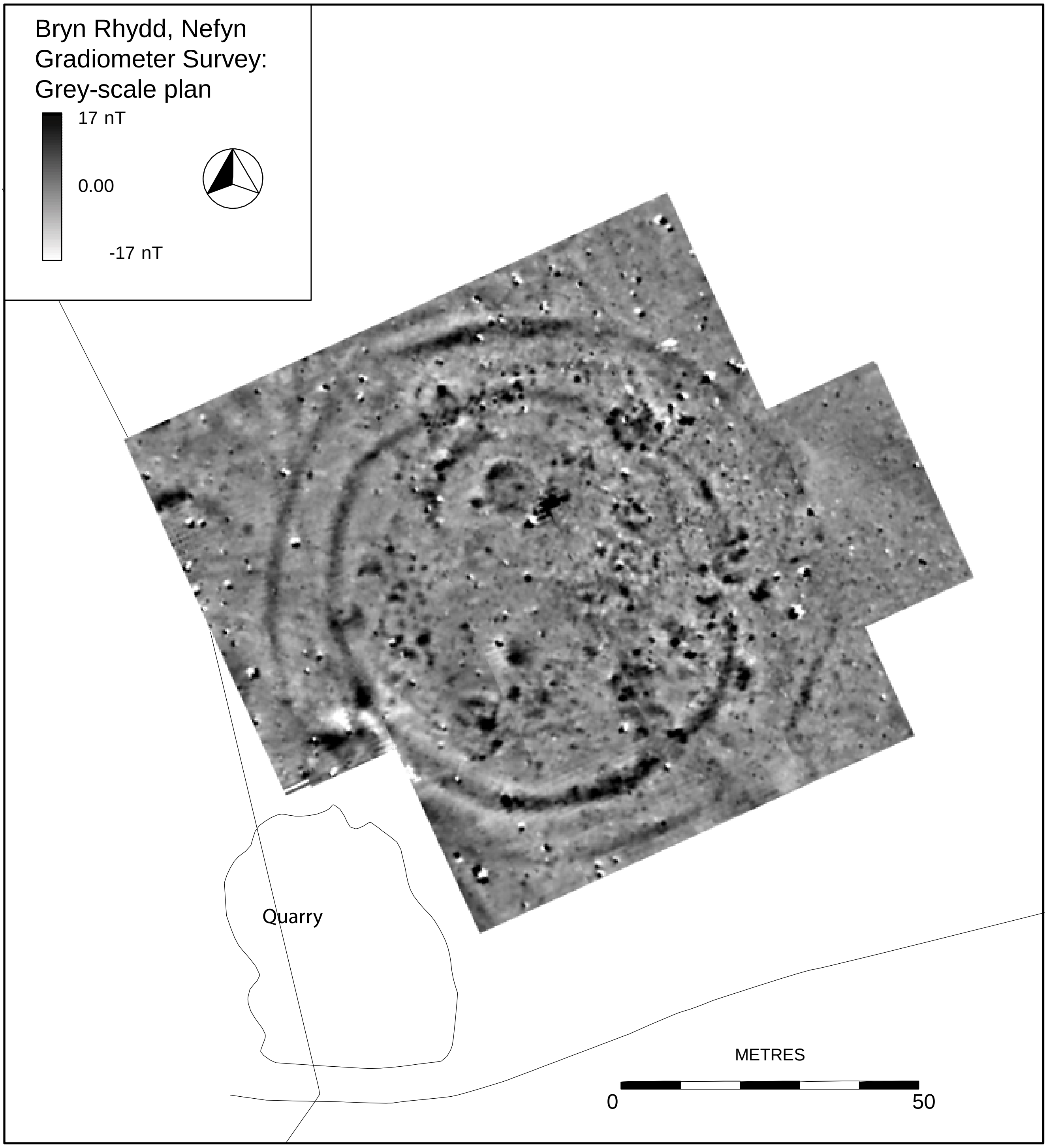

Fig. 5 Bryn Rhydd defended enclosure, Nefyn: Geophysical survey 2006

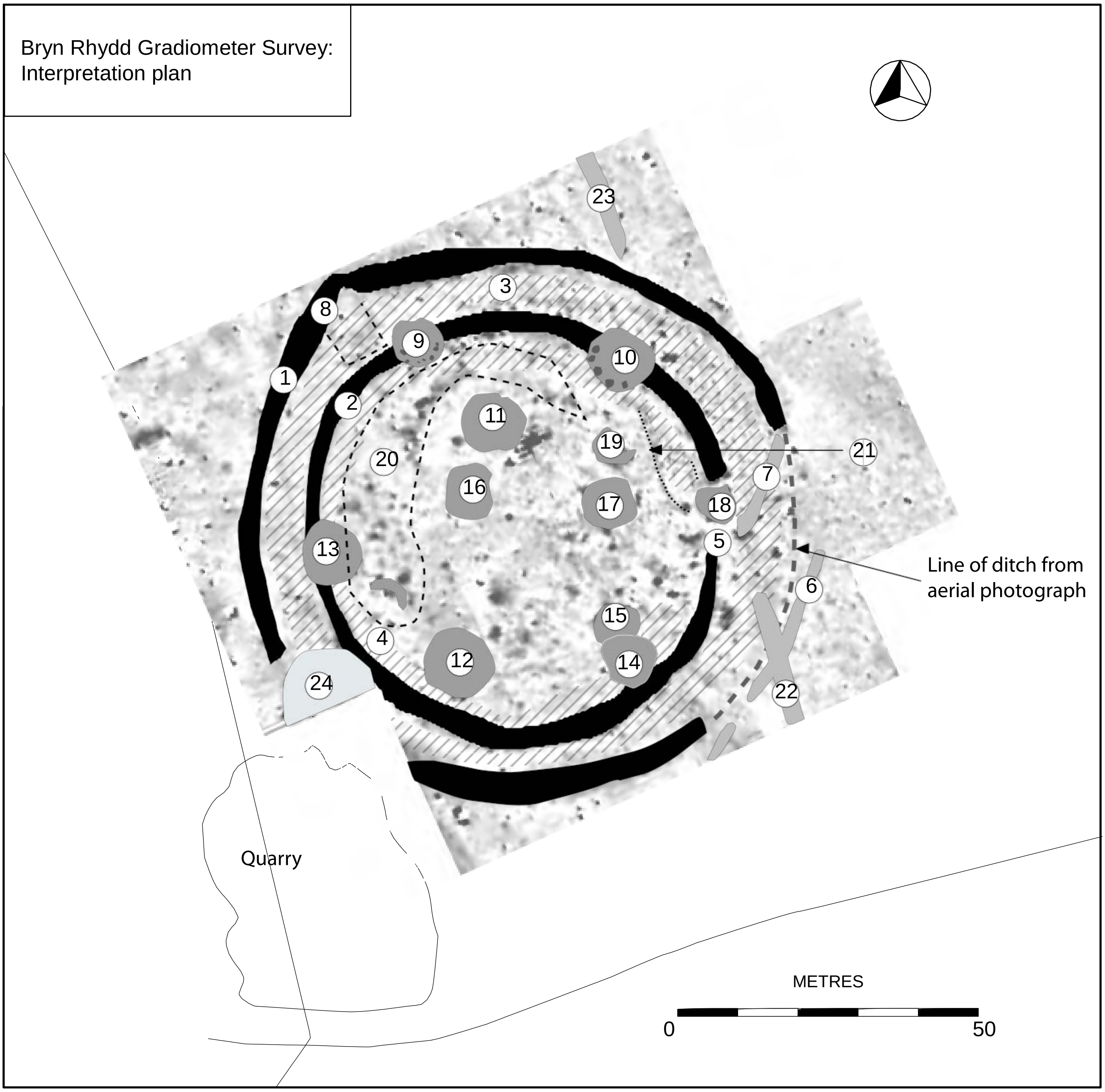

Fig. 6 Bryn Rhydd defended enclosure, Nefyn. Interpretation plan

Fig. 7 Bryn Rhydd defended enclosure, Nefyn: Location of soil test pits
in relation to the geophysical survey 2006

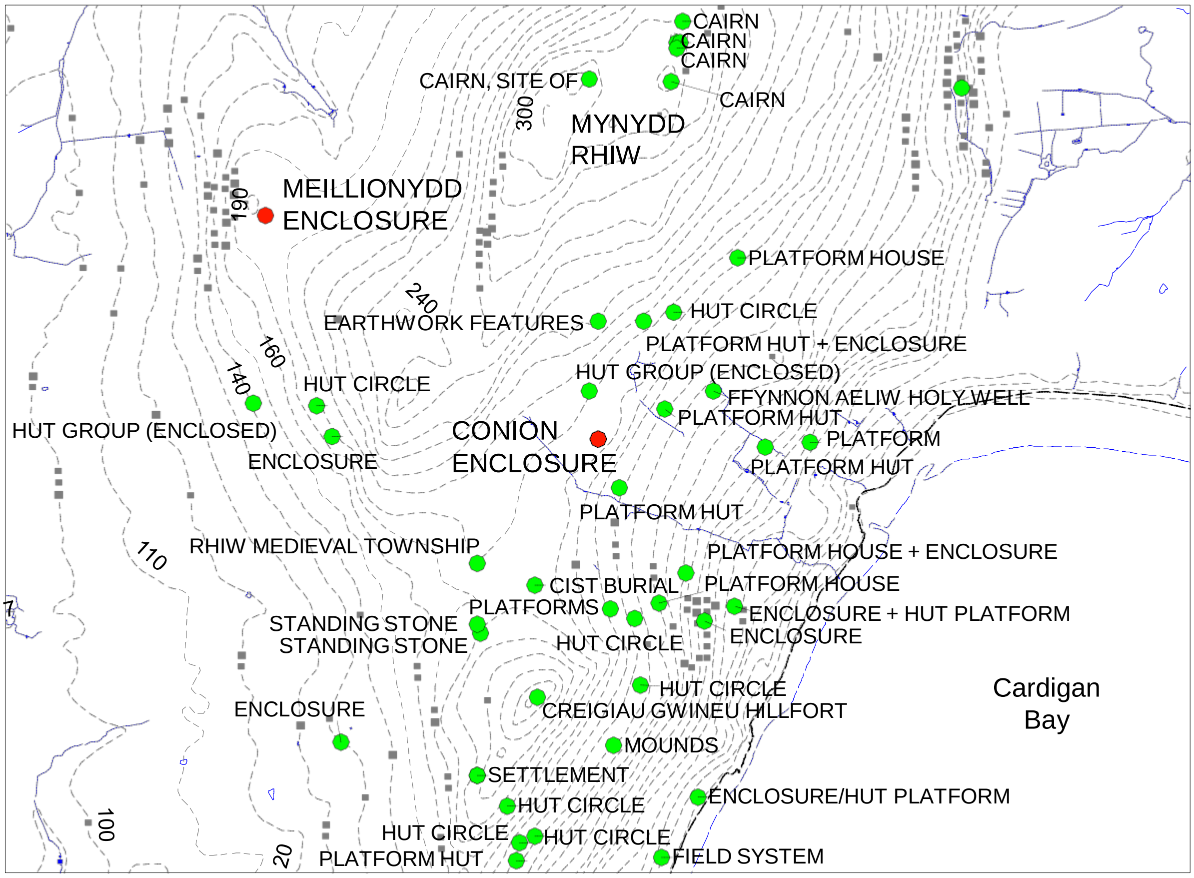

Fig. 8 Conion, Rhiw: Location map.
Scale 1:25000.

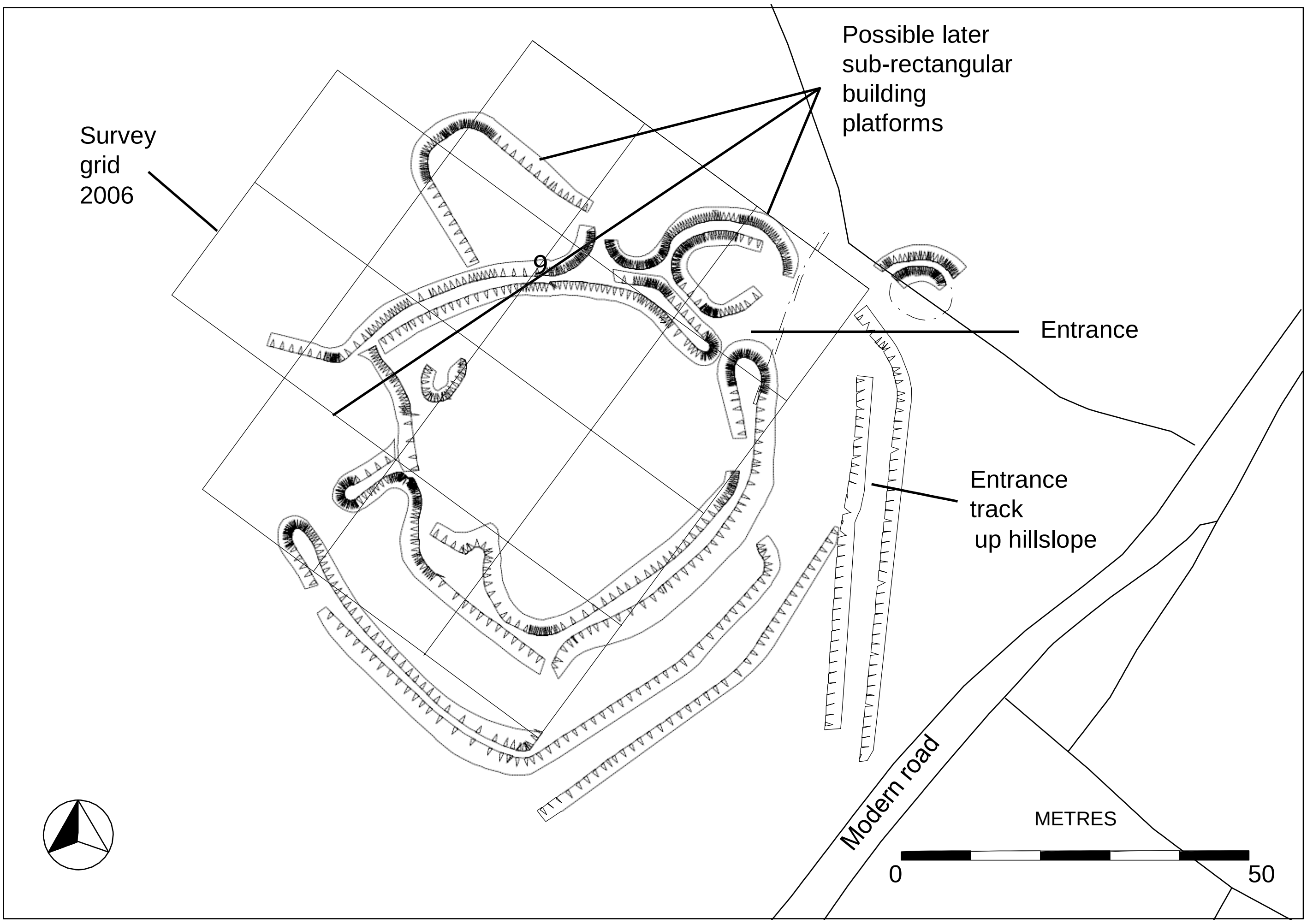

Fig. 9a Conion, Rhiw: Ordnance Survey plan of the earthworks and location of the survey grid. Scale 1:1000.

Fig. 9b Conion, Rhiw. Aerial photograph showng the enclosure and adjoining traces of strip fields. From the north-east. Photo by Toby Driver 2006. Copyright RCAHM:W.

Fig. 10 Conion defended enclosure, Rhiw: Geophysical survey 2006

Fig. 11 Conion defended enclosure Geophysical survey: Interpretation plan

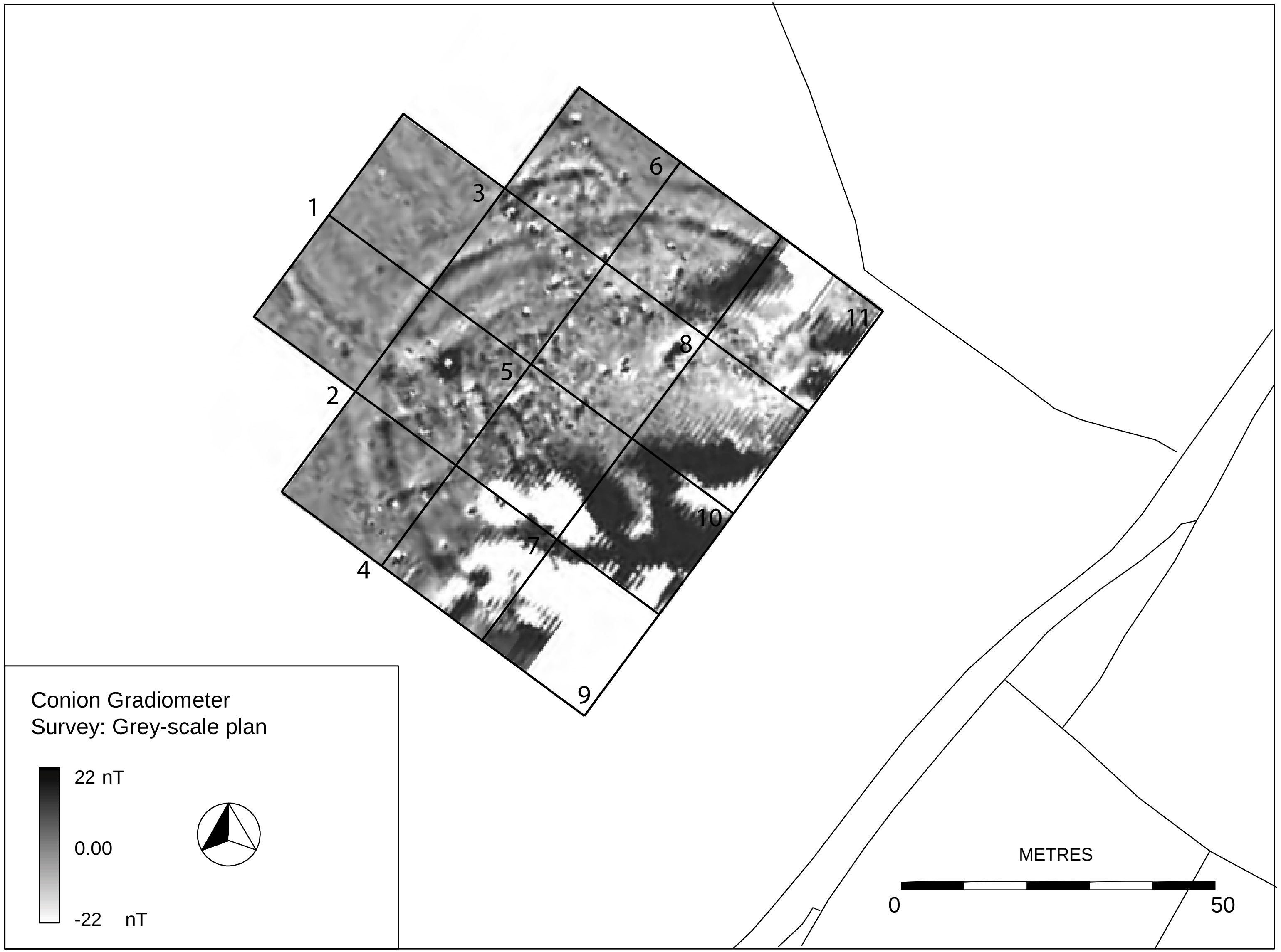

Fig. 12 Conion, Rhiw: Location of the soil test pits in relation to the geophysical survey

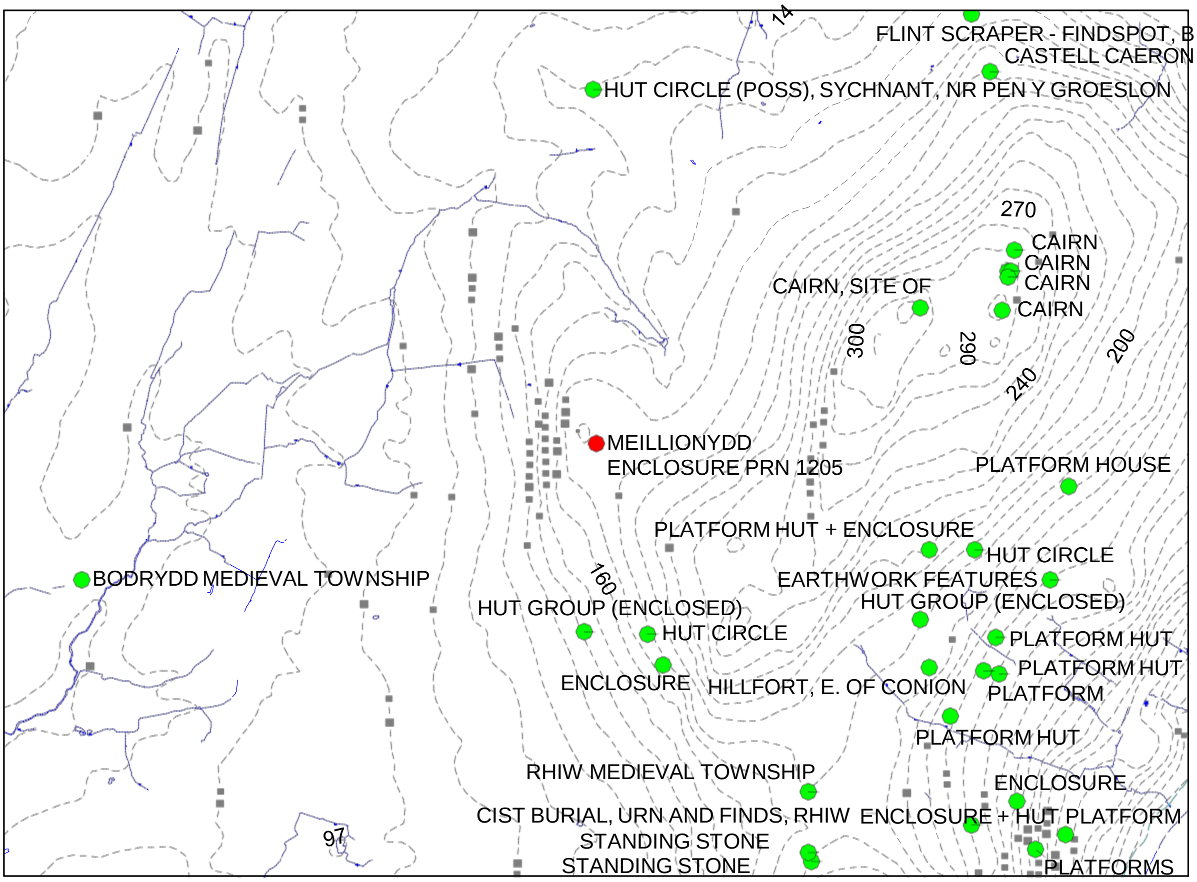

Fig. 13 Meillionydd defended enclosure, Rhiw, PRN 1205. Topographic location.
Scale 1:25000. © Crown copyright. All rights reserved. Licence number AL 100020895.

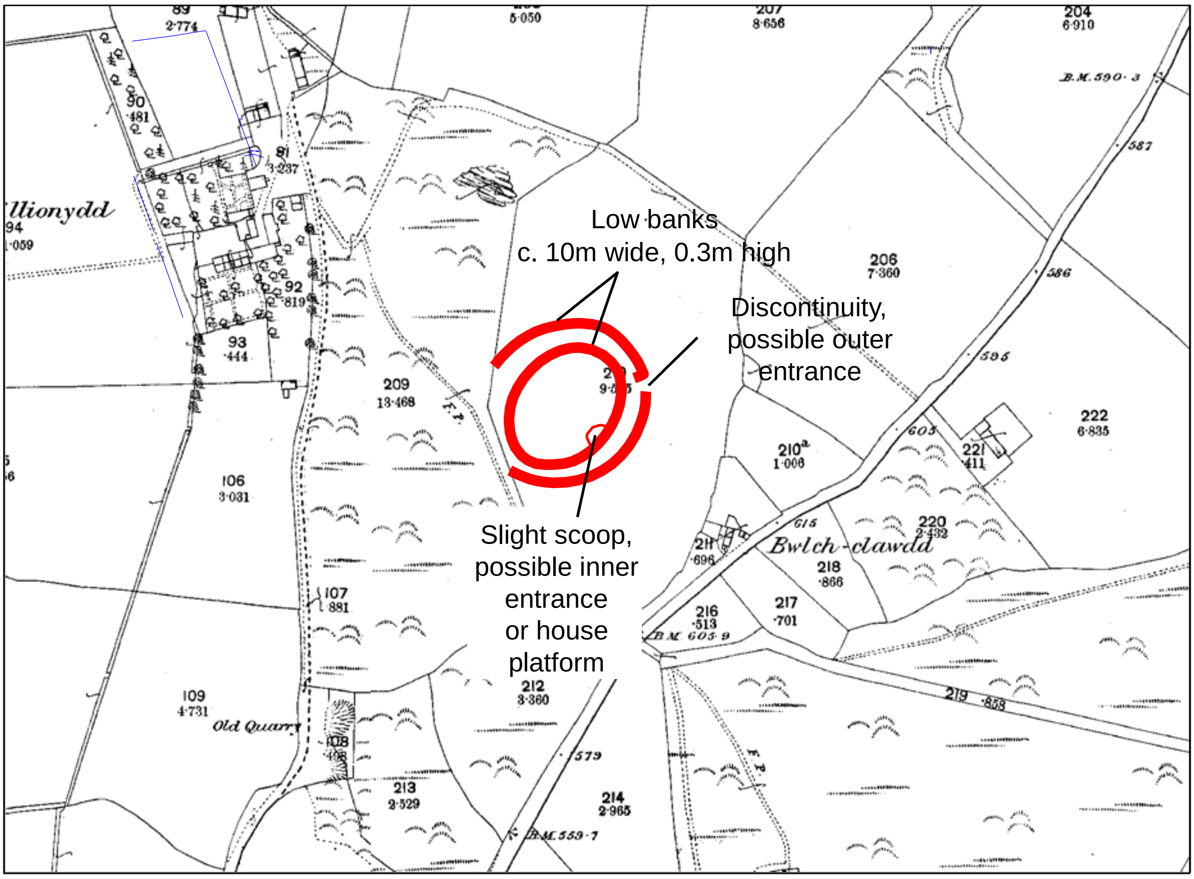

Fig. 14 Meillionydd defended enclosure, Rhiw, PRN 1205. Sketch plan based on Ordnance Survey 1:2500 map.
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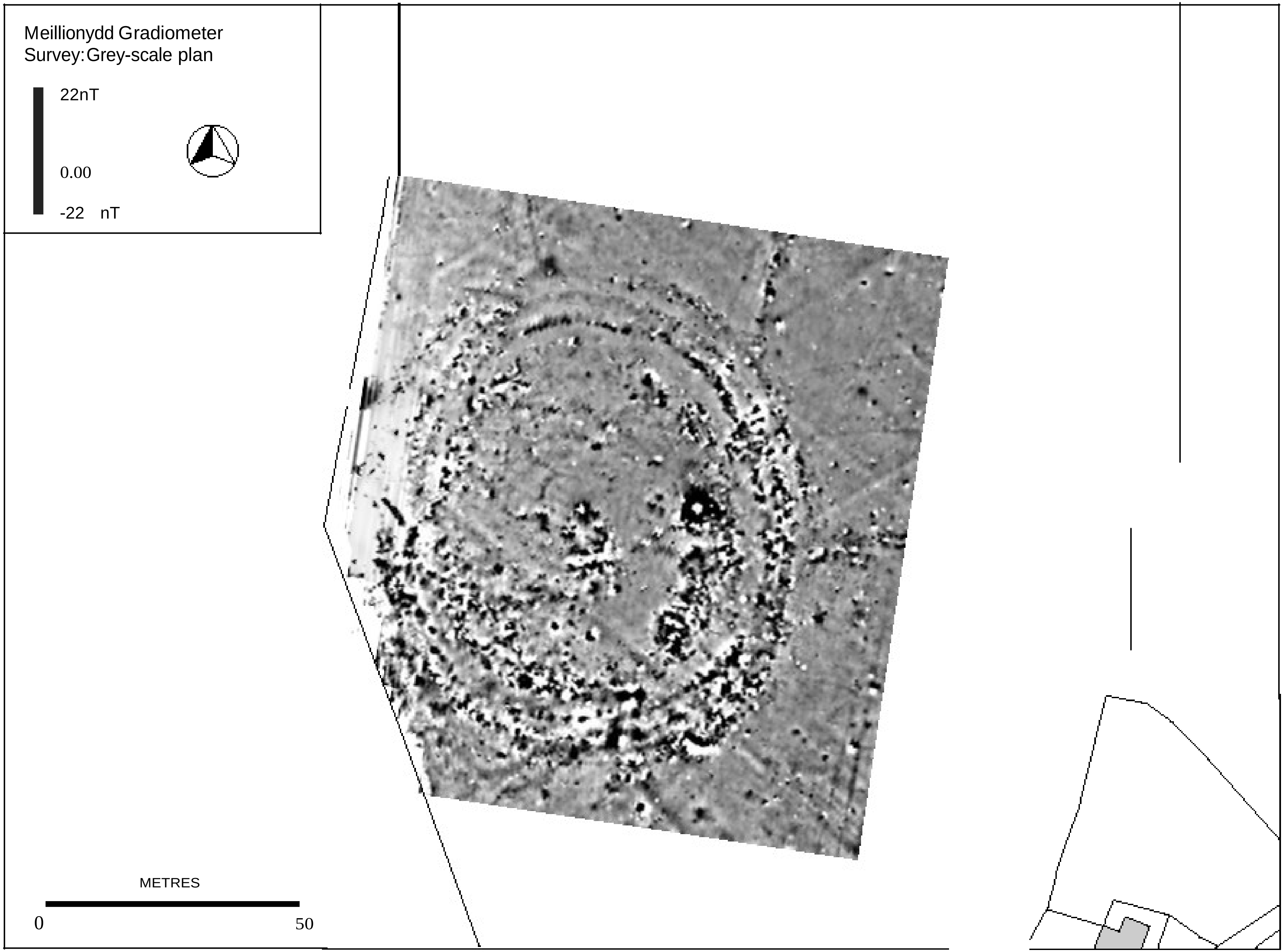

Fig. 15 Meillionydd defended enclooure, Rhiw. Geophysical survey 2006

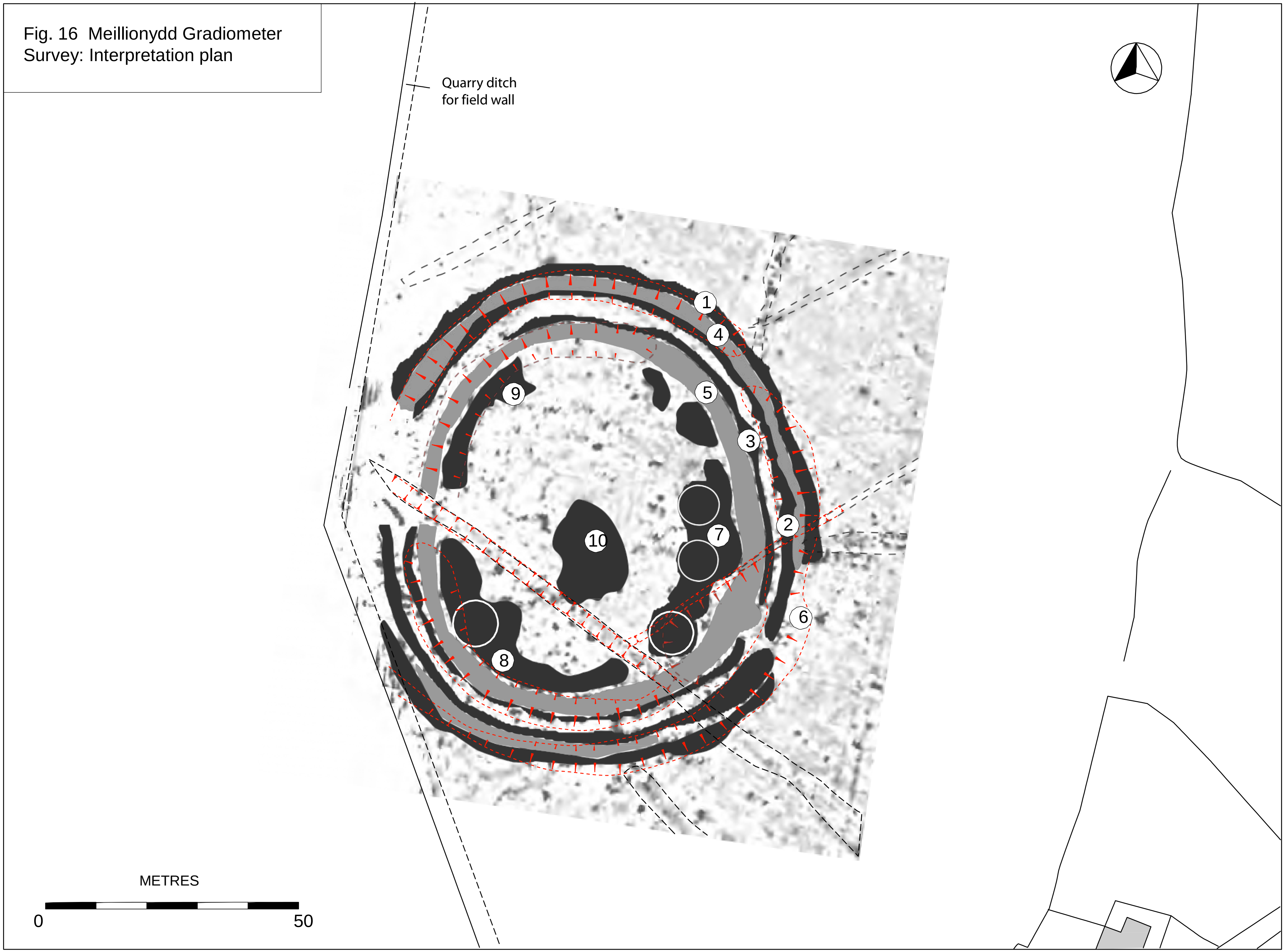

Fig. 16 Meillionydd defended enclosure. Geophysical survey: Interpretation plan

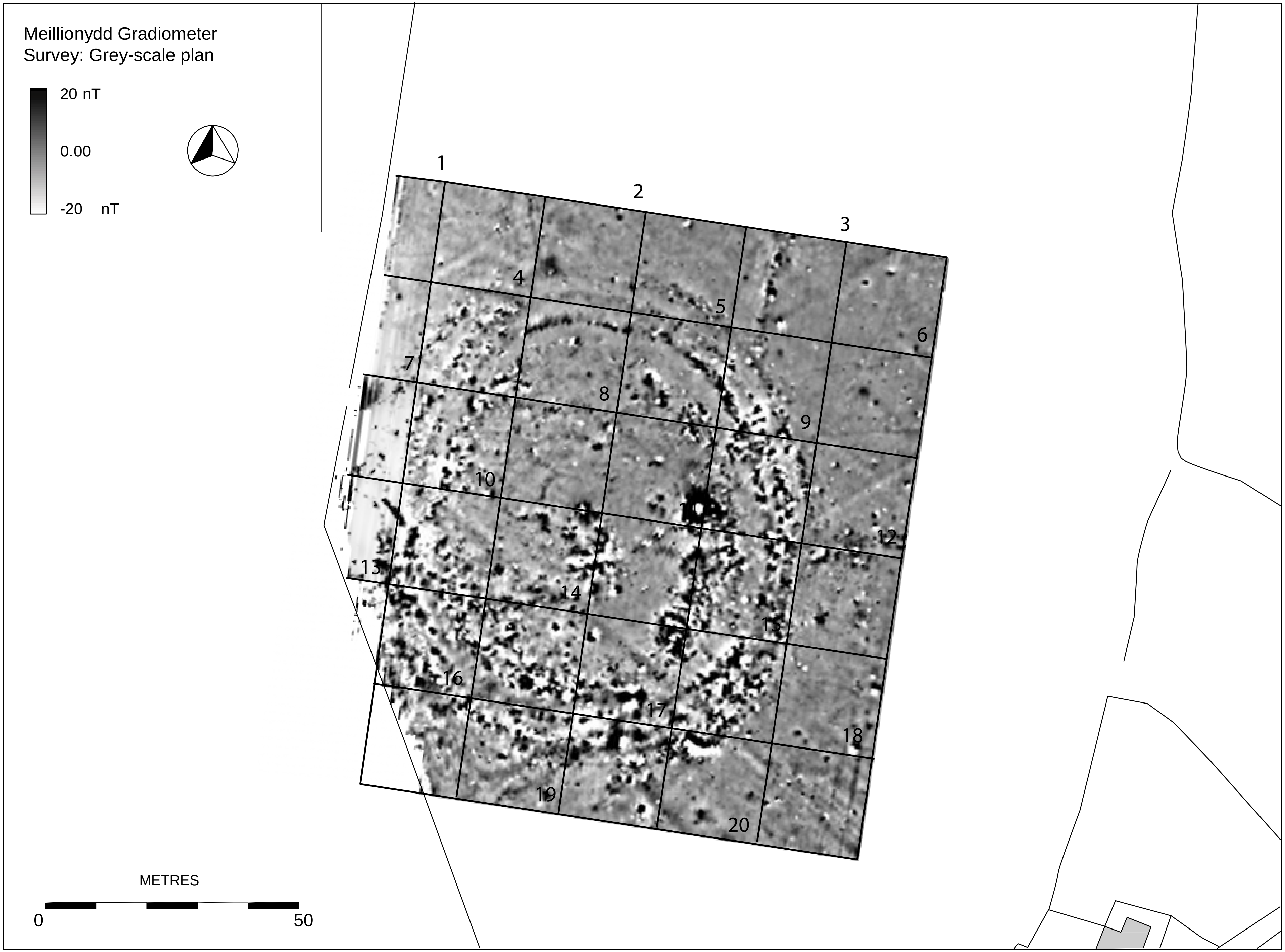

Fig. 17 Meillionydd, Rhiw: Location of the soil test pits in relation to the geophysical survey

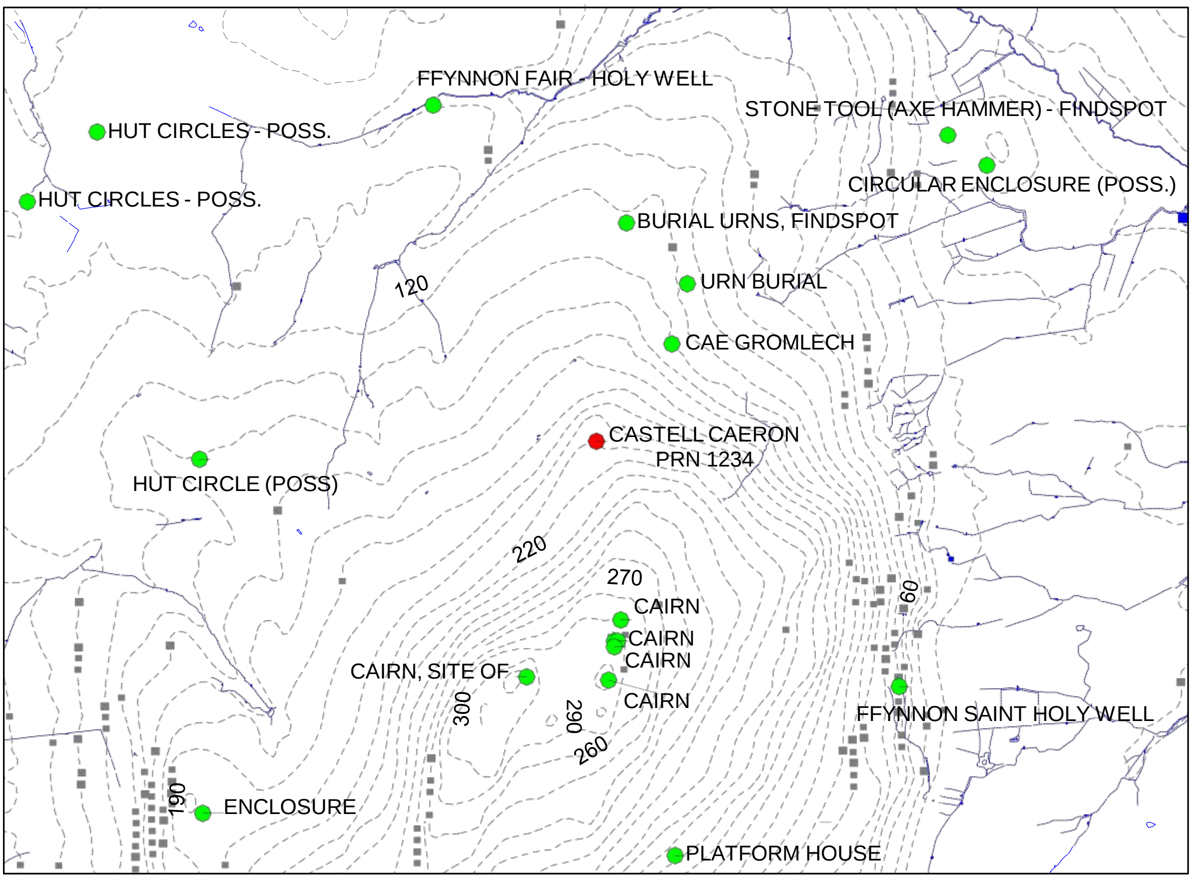

Fig. 18 Castell Caeron defended enclosure, Rhiw, PRN 1234
Topographic location. Scale 1:25000.

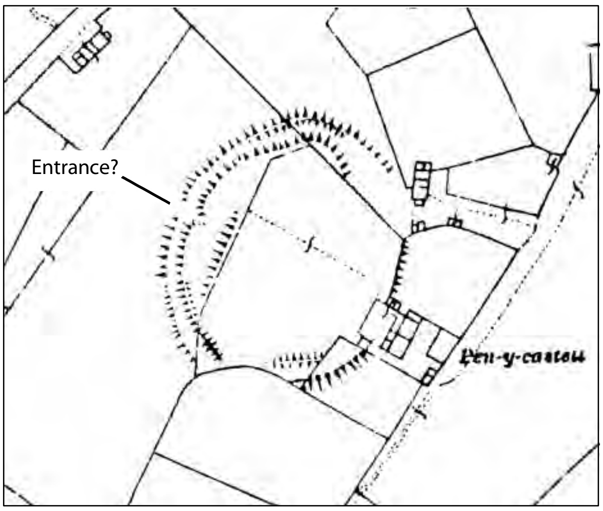

Fig. 19 Castell Caeron defended enclosure, Rhiw, PRN 1234
Plan from Ordnance Survey 1:2500.

Fig. 20 Ca.stell c,.,ron, Rhiw, Geopey.sical.survey 2006

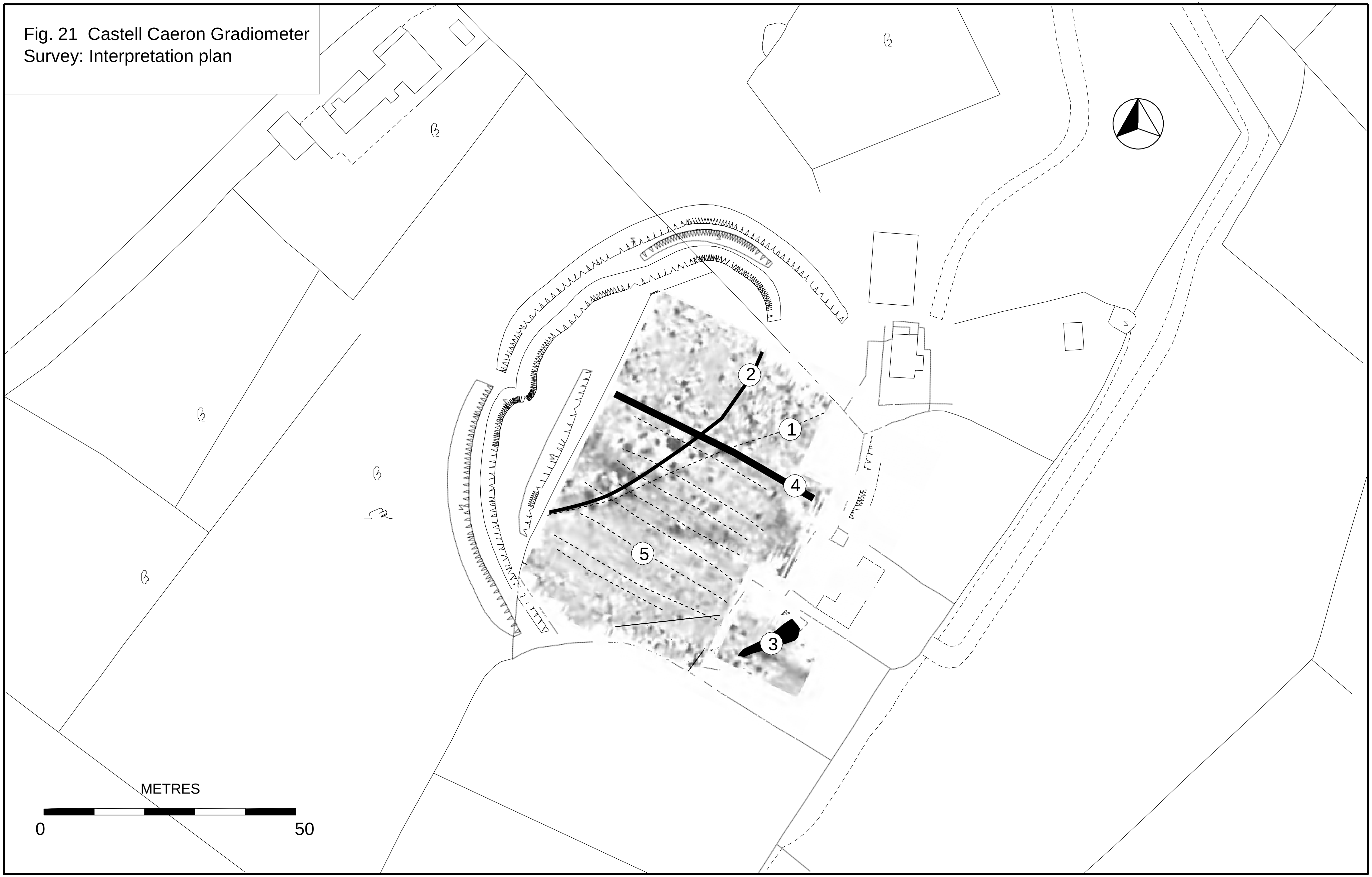

Fig. 21 Castell Caeron defended enclosure. Geophysical survey: Interpretation plan

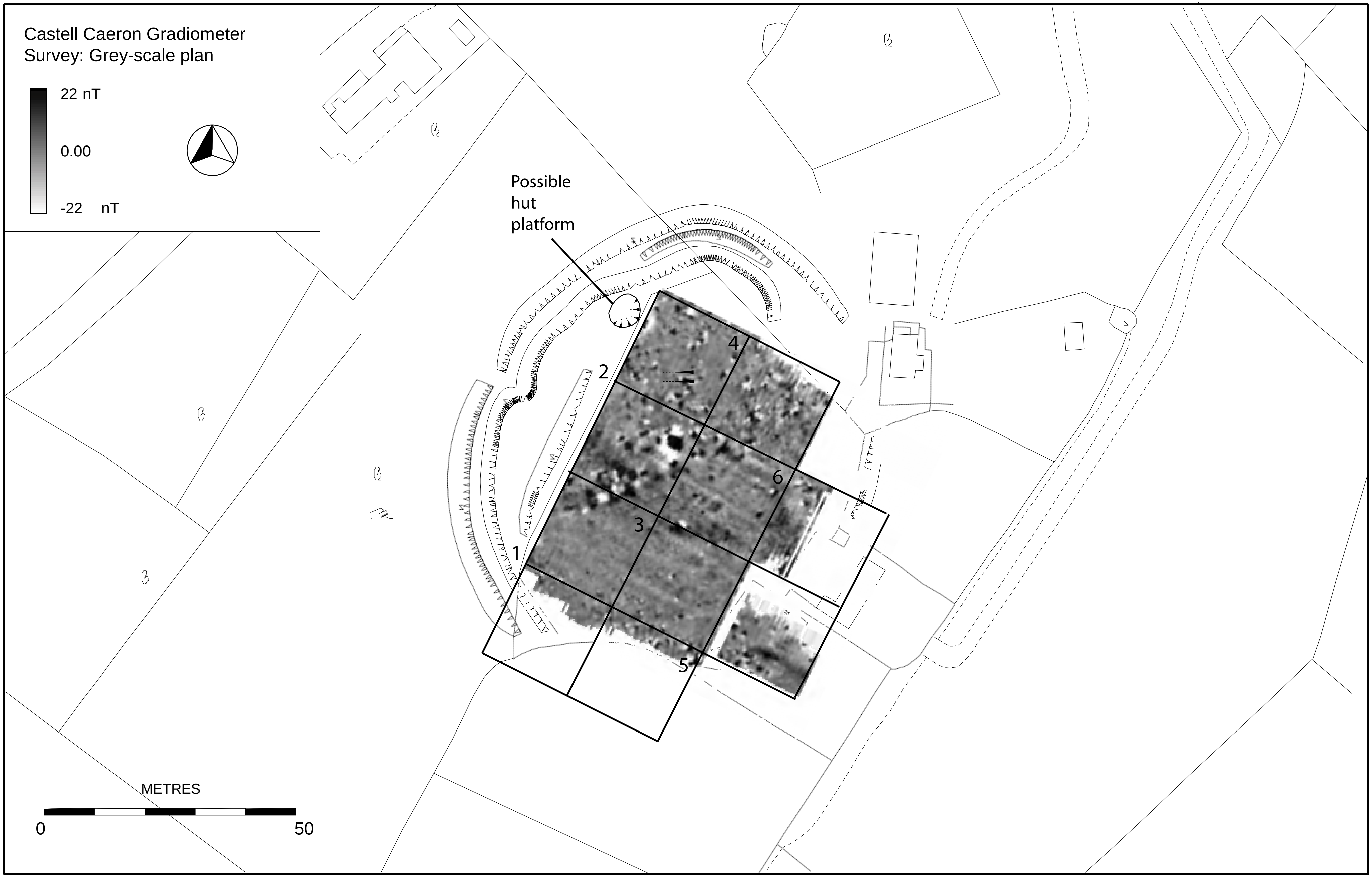

Fig. 22 Castell Caeron, Rhiw: Location of soil test pits in relation to the geophysical survey

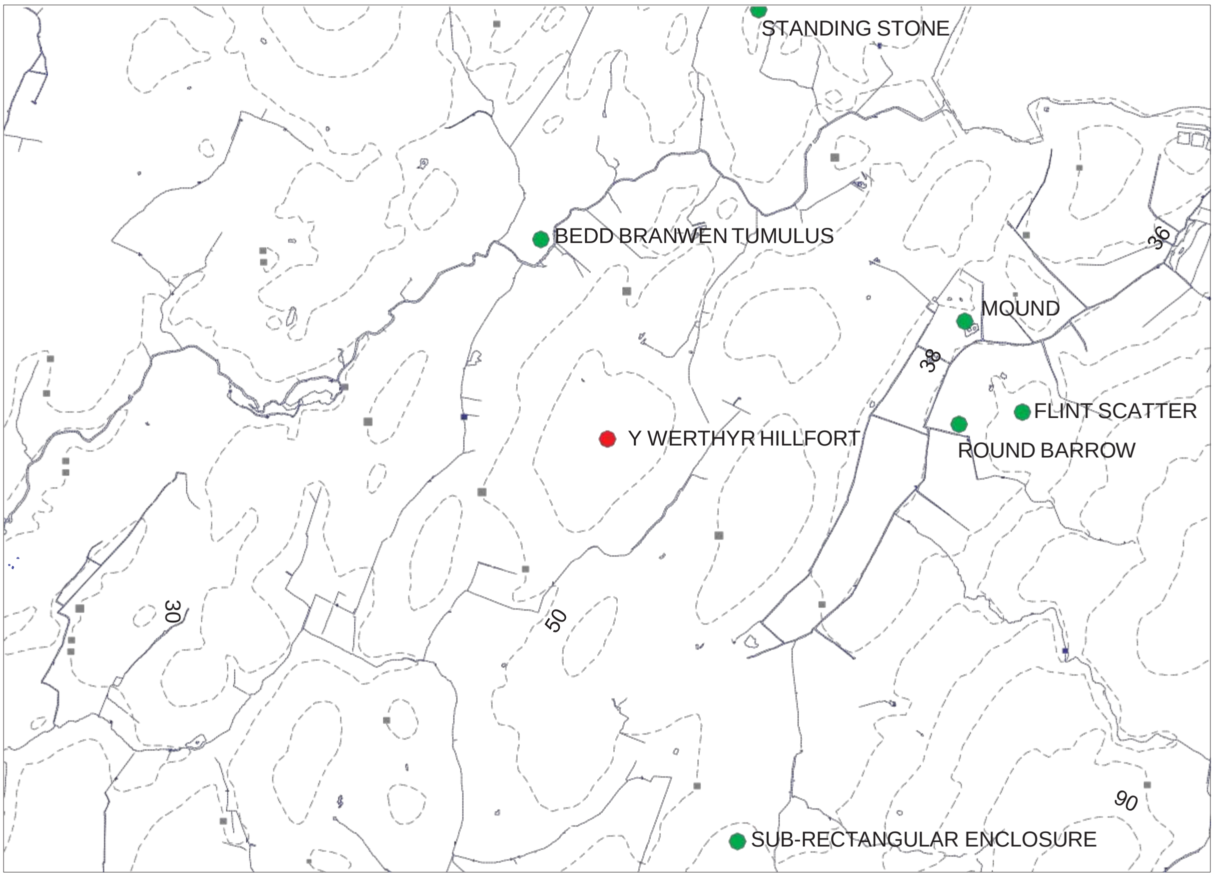

Fig. 23 Y Werthyr hillfort, Llantrisant, PRN 2077.
Topographic location. Scale 1:25000.

Fig. 24 Y Werthyr hillfort, Llantrisant, PRN 2077.Aerial photograph 2006, from the south-west.

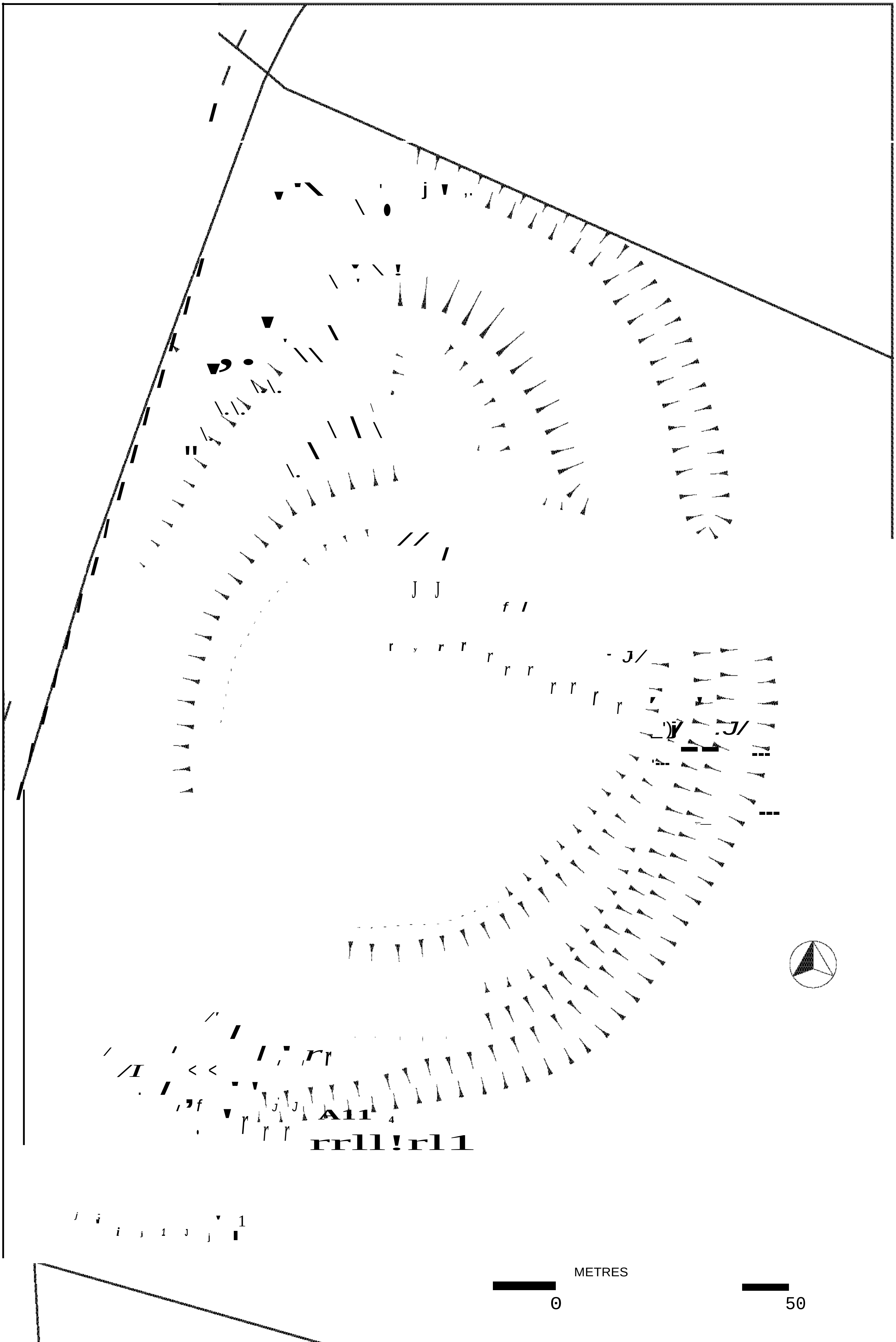
METRES
0
50

Fig. 25 Y \Verthyr, Llantrisant -Topographic rapid measured survey

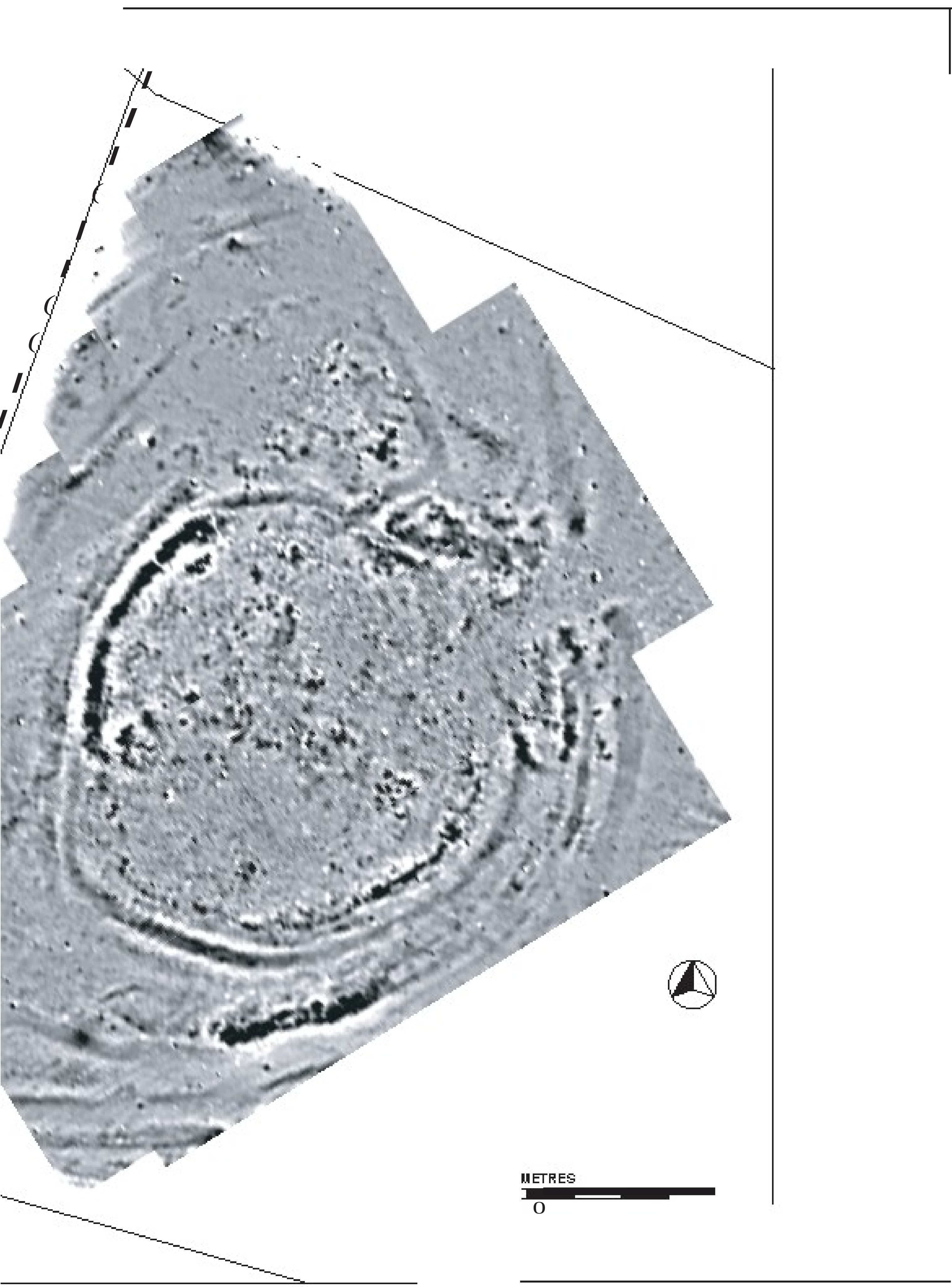

Fig. 26 Y Werthyr,LJ.ntrisant - O.Ophysical Survey: Greyscale plot

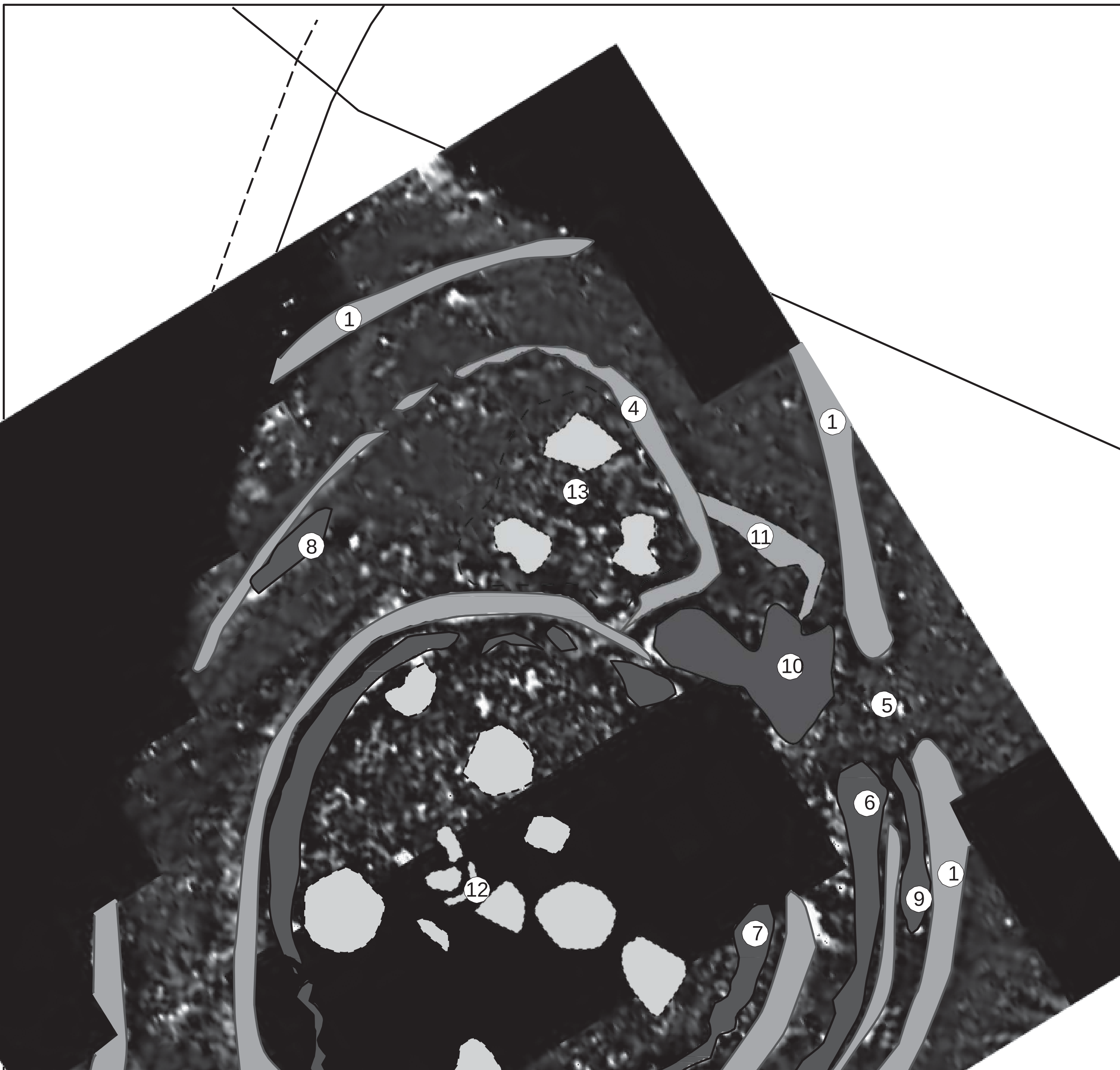

Fig. 27 Y Werthyr, Llantrisant - Geophysical Survey: Interpretation plan

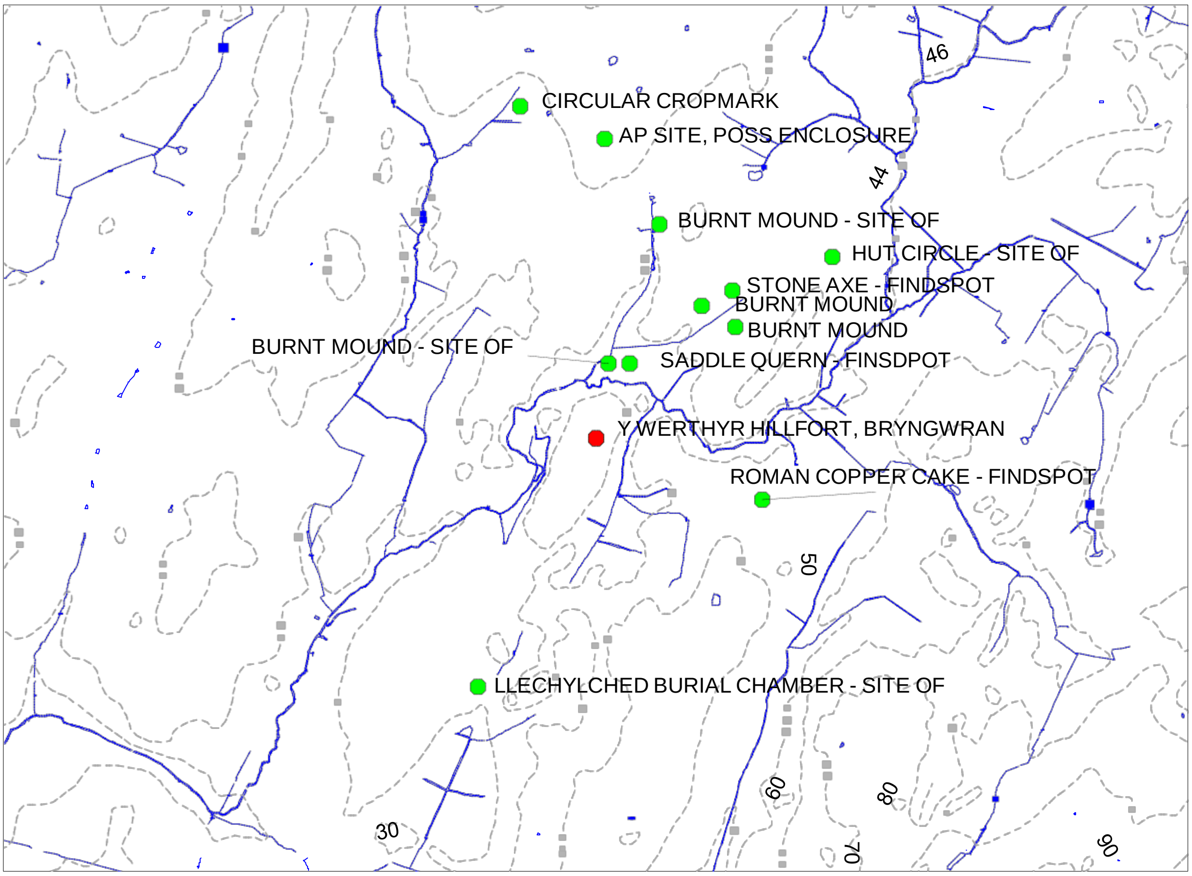

Fig. 28 Werthyr, Bryngwran: Topographic location. Scale 1:25000.

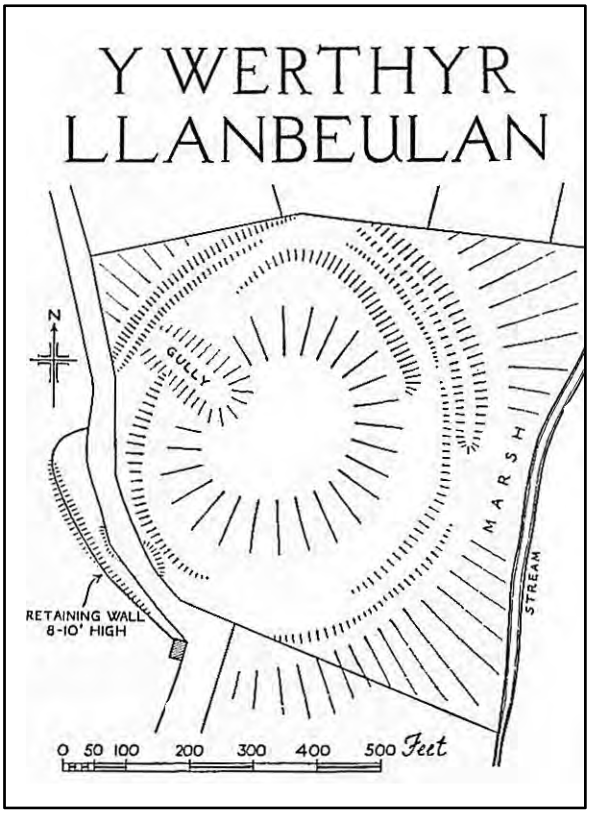

Fig. 29 Werthyr hillfort, Bryngwran: Plan by RCAHMW (1937), before diversion of the road across the centre of the enclosure

Fig. 30 Werthyr, Bryngwran, PRN 3505. Aerial photograph 2006, from the east.
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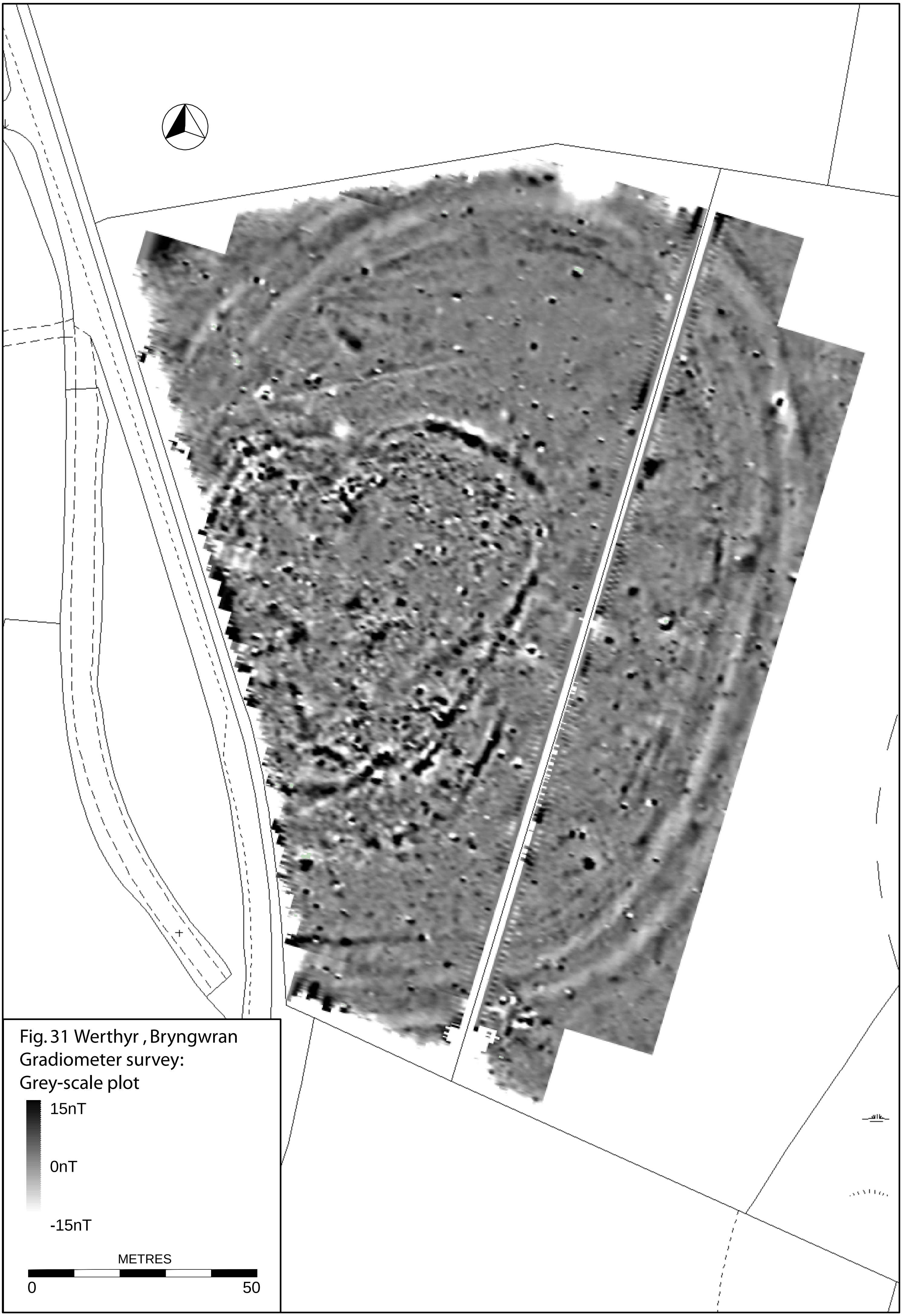

Fig. 31 Werthyr , Bryngwran
Gradiometer survey:
Grey-scale plot

15nT

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0 50

Fig. 32 Werthyr, Bryngwran
Gradiometer survey:
Interpretation plot

METRES
0 50

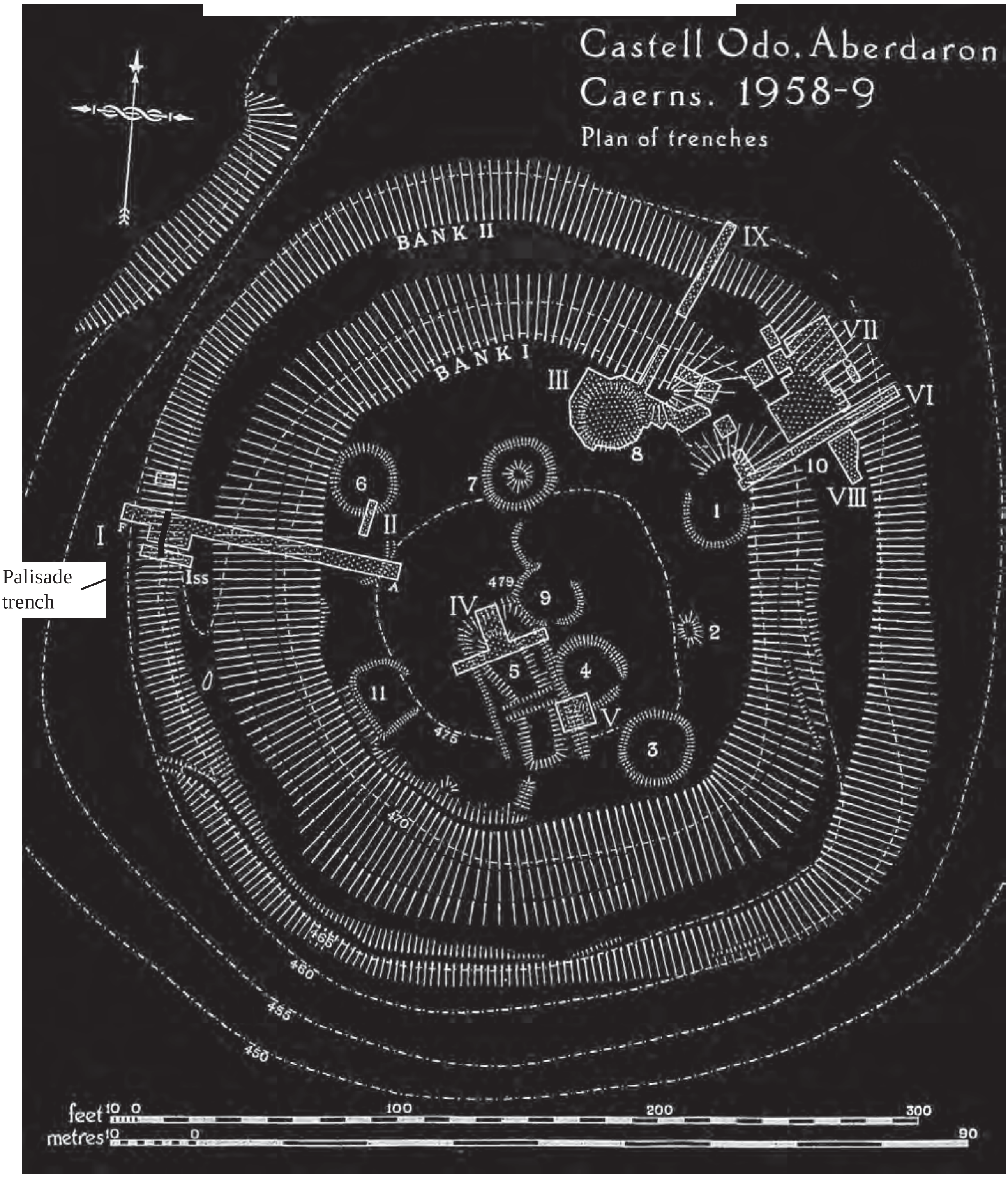

Fig. 33 Castell Odo, Aberdaron. General excavation plan (Alcock 1960), with added annotation

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Craig Beuno, Ffordd y Garth, Bangor, Gwynedd LL57 2RT Ffon/Tel 01248 352535 Ffacs/Fax 01248 370925
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