PARC BRYN CEGIN, BANGOR

REVISED ARCHAEOLOGICAL ASSESSMENT

PROJECT NO. G1857

REPORT NO. 565

Prepared for Jacobs GIBB Ltd

February 2005

By

G.H. Smith

Ymddiriedolaeth Archaeolegol Gwynedd
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1. INTRODUCTION

The proposed development of an area of land centred on NGR SH 592705, adjacent to the existing industrial estate at Llandegai, Bangor was granted outline planning permission in 2001. The planning application was accompanied by an Environmental Impact Statement that included an archaeological assessment carried out by Gwynedd Archaeological Trust (Hopewell and Davidson 1999). The main factor relevant to the proposed development area was the presence just to the north of an important area of archaeological remains discovered during the preparatory work for the existing industrial estate there. This area included numerous features of various periods but was most notable for the presence of two large 'henge' monuments – large circular ceremonial enclosures of Middle to Late Neolithic date, that is between 3100 and 2300 B.C. Monuments of this type are rare in Britain but exceptionally so in Wales. A full archaeological involvement for the new development was therefore essential and a Design Brief for Archaeological Mitigation was supplied by Gwynedd Archaeological Planning Service (GAPS) (Appendix 1).

Subsequently a programme of archaeological work was proposed by Jacobs GIBB for the Welsh Development Agency to meet the planning requirements (Jacobs 2004). This comprised three phases of work, of which the present report covers Stages A and B:

'Stage A

1. Review and re-evaluation of published work, principally *Archaeologia Cambrensis 2004* and previous work by Gwynedd Archaeological Trust in 1999 as part of the EIA.

2. Geophysical survey to a level of site coverage considered appropriate under current best practice.

Stage B

1. Produce a report containing the results of the desktop study and geophysical survey.

Stage C

Discuss findings of Stages A and B with GAPS to define the extent of intrusive survey required.'

2. METHODOLOGY

A desk-based assessment was carried out using information in the Gwynedd Historic Environment Record (HER, formerly Gwynedd Sites and Monuments Record), previous reports and relevant publications. Archive material was re-assessed for further possible information at the Archives of the University of Wales, Bangor. Aerial photographs were studied including photographs held at the National Monuments Record Office, Aberystwyth and the Unit for Landscape Modelling, University of Cambridge.

The re-evaluation of the archive material was intended to throw further light on interpretation of the area, including the results of the previous sample geophysical survey. Information additional to the 1999 assessment comprised firstly the full publication of the multi-period archaeological site immediately to the north, excavated in 1966-7 (Lynch and Musson 2004), which might indicate the likelihood of other related features continuing into the development area or of the general interpretation of the area and secondly a palaeo-environmental study carried out at a small lake, Llyn Cororion, 2km to the south of the development area (Watkins 1990).

The revised assessment combines all the sources of available information, discussing them in terms of archaeological potential by period and assessing the results of the geophysical surveys carried out in 1999 and 2005. The 1999 geophysical survey was of 13 sample areas distributed randomly across the whole development site (Hopewell and Davidson 1999). The 2005 geophysical survey was a 100% coverage of the eastern two fields of the development site (Stratascan 2005). The assessment also considers the evidence from the engineering geological borehole and test-pits carried out by *Geotechnics* for Jacobs in January 2005.

The geological survey will show the type and depth of soils and subsoils present in different parts of the area, which might indicate the potential for settlement or agriculture as well as the potential for survival. The overall geophysical survey can be expected to identify any sub-soil archaeological features that might be present and these can be interpreted in the light of the desk-top study, which will, for instance, identify Post-medieval agricultural features that might confuse the interpretation of earlier and more valuable archaeological features.

3. TOPOGRAPHIC BACKGROUND

The study area comprises about 36 hectares (89 acres) consisting of five large sub-rectangular fields occupying a long low promontory between the valleys of the Afon Cegin and the Afon Ogwen. The fields are presently used for improved pasture but all have been extensively ploughed in the past.

Most of the area consists of a gentle hillslope that falls to the north towards a slight basin or plateau at about 40m OD, the area where the well-known Neolithic henge complex of Llandegai was located (Fig. 2). The ground also falls gently and lower to the west where it borders the narrow valley of the Afon Cegin. The ground rises to the east edge of the site where there is a ridge that rises to a height of 75m OD within the site but rising further to the south. The eastern side of fields 2 and 3, on top of the ridge, are relatively level.

The solid geology is of Ordovician shales, which outcrops occasionally along the ridge at the east. However, much of the area is covered with glacial drift and it is this that determines the soils. The eastern half of the area has soils of the Arvon Series and the western half of the area soils of the Deiniol Series, both acid igneous brown earths (SSEW 1958). The land of the Arvon Series is classed as of agricultural capability Grade 3 - Good to Moderate, usually free-draining with moderate limitations as to types of crop that can be grown, mainly suitable for grass ley, the fertility not high enough to allow extensive arable use. The land of the Deiniol Series is classed as agricultural capability Grade 4 – Poor, which is imperfectly drained with severe limitations as to use, being difficult to cultivate and sensitive to soil structure damage and panning (Ball 1963, 46; MAFF 1988).

4. ARCHAEOLOGICAL BACKGROUND

The distribution of known sites and finds in the area

Study of material held at the Gwynedd Historic Environment Record identified some twenty-two features or finds within 1km of the development area that might have a bearing on its interpretation (Fig. 2 and Table 1) although there are no known archaeological or historic features or finds from within the development area itself. The historic environment records include the finds from the earlier Llandegai excavations themselves, which included significant activity from several periods, from the Early Neolithic to the Early Medieval periods. The main features were ceremonial monuments of the Neolithic period, with two large circles, each about 90m diameter, two lesser circles and a 'cursus' or embanked linear enclosure. There were also the circular ditches of a large burial mound of the Early Bronze Age. The site was also re-used for settlement in the first millennium BC and in the Roman period and later an inhumation cemetery was created in the Early Medieval period, between the 6th to 10th centuries AD. This complex of features and finds provides the closest and most useful source of information about potential of the development area and is used as a basis for the assessment.

To the north of the development area have been found stray finds of worked flint, though these were undatable waste pieces. In the Cegin valley, to the south-west was found a plano-convex flint knife, a type usually found in Early Bronze Age contexts. One burial mound of Early Bronze Age date is known in the area, from Carnedd Howel, 1km to the south but crop marks of small ring ditches that might be the remains of other burial mounds have been seen in aerial photographs of Park Penrhyn to the north. There are also finds of bronze palstaves of Middle Bronze Age date from Llandegai and Maesgeirchen. Other finds that are broadly of second millennium date are stone hammers from an uncertain location in this area, a burnt mound from Rhos Uchaf on the east facing slope of the Ogwen Valley, 300m to the south-east and some hearths of probable prehistoric date found 400m to the south, during to construction of the A55 Bangor by-pass.

A Roman road, between Caerhun, Conwy Valley and Segontium, Caernarfon is believed to have passed about 500m to the south-east of the development area. There is a suspected site of a Roman fortlet at Tal-y-bont, finds of a Roman coin from close to the Ogwen, a possible river-crossing point and a Roman milestone from Pentir, 1km to the south-west, but not in its original position.

Llandegai village has medieval origins with a church of the 14th century and there are records of an earlier church nearby (Lynch 2004, 115). There are earthworks of 'platform huts' in Penrhyn Park (PRN 6626) to the north-east. These are most probably of medieval (11th to 13th century) date, though they could be somewhat earlier. Study of field patterns and names recorded on 18th century estate maps shows evidence of medieval fields in the Llandegai area, including some within the development area and these will be discussed further below.

Table 1 Archaeological and Historic features and finds within 1km of the development area recorded in the Gwynedd HER (formerly the Gwynedd SMR)

PRN	Site name	NGR	Site type	Period
18	Roman milestone - find spot, Ty Coch, Pentir	SH58306960A	Milestone	Roman
30	Cairn with food vessels, Carnedd Howel	SH59286914	Cairn	Prehistoric
222	Henges, cursus & Neolithic settlement, Llandegai	SH59307110C	Henge	Prehistoric
812	Track or roadway, Llandegai	SH59406965	Trackway	Unknown
815	Burnt mound, Rhos Uchaf	SH59786978	Burnt mound	Unknown
877	Prehistoric industrial site - possible, Wet Covert, Llandegai	SH59346946	Occupation site	Prehistoric
2308	Stone hammers - find spot, Bangor	SH58007100A	Find spot	Unknown
2309	Palstave - find spot, Maesgeirchen, Bangor	SH58597155	Find spot	Prehistoric
2311	Settlement, Llandegai	SH59307110A	Settlement	Roman
2312	Settlement, Llandegai	SH59307110A	Settlement	Roman
2313	Settlement, Llandegai	SH59307110A	Settlement	Early-Medieval
2314	Henge monument and cursus - site of, Llandegai	SH59557100	Henge	Prehistoric
2317	Bronze tool (palstave) - find spot, Llandegai	SH60007100A	Find spot	Prehistoric
2319	Llandegai church	SH60077098	Church	Medieval
2456	Roman fortlet, Tal-y-bont	SH60697068	Fortlet	Unknown
2812	Bronze palstave - find spot, Maesgeirchen	SH59207150A	Find spot	Prehistoric
5488	Coins - find spot, Tal-y-bont	SH60197053	Find spot	Post-Medieval
6578	Possible worked flint finds, Llandegai	SH59057085	Find spot	Prehistoric
6623	Earthworks, Penrhyn Park	SH59657155C	Earthwork	Unknown
6624	Earthwork, Penrhyn Park	SH59907165	Earthwork	Unknown
6626	Platform huts, Penrhyn Park	SH60247115C	Hut platform	Medieval
6890	Roman coin - find spot, Llandegai	SH60057025A	Find spot	Roman
7870	Flint knife - find spot, SE of Minffordd	SH58547011	Find spot	Prehistoric
11769	Cochwillan mill	SH60166985	Corn mill	Post-Medieval
17567	Part of Roman road, Segontium – Canovium	SH59556998	Road	Roman

5. ASSESSMENT OF ALL PREVIOUS ARCHAEOLOGICAL WORK IN THE LLANDEGAI AREA AND ITS IMPLICATIONS FOR THE DEVELOPMENT AREA

5.1 The 1966-7 Excavations and Geophysical Survey

5.1.1 The earliest activity in the area

The earliest date from the Llandegai site came from a piece of pine charcoal sealed beneath the bank of the northern henge, producing a radiocarbon date of 7965 +/- 25 BP (GrN-27193), *c.* 7000 cal BC (radiocarbon ages vary through time and need to be calibrated to produce a true date by comparison with an absolute series derived from tree-ring counts of long-lived trees and preserved ancient trees). However, it was thought that this might have derived from a natural forest fire. The earliest actual identifiable archaeological activity was represented by several undated shallow pits found just outside the northern henge, one of which contained worked flint tools of Later Mesolithic type, indicating a date within the seventh to fifth millennia B.C. It is not impossible therefore that the pine charcoal is associated with this phase of activity. In the peat column from the lake sediments sampled at Llyn Cororion, 2km to the south, pine expanded rapidly from around 8425 +/- 70 BP and was in fact locally prominent along with oak and elm in this period, unusually as lower proportions of pine are more usual at this time in North Wales (Watkins 1990, 135). At about 7750 BP pine began to decline, proportionately and there was evidence of possible human activity. Charcoal was present in the peat, there was a distinct peak in *Melampyrum* (Cow wheat, often associated with forest fires, because its dispersal is aided by fire), and increases in Gramineae (grasses) and Cyperaceae (sedges). *Plantago lanceolata,* Umbelliferae and Compositae were also present. These all suggested temporary clearance of the forest by man, possibly for pasture. This period of activity at Llandegai preceded the Neolithic phases by a considerable interval and their proximity is only by chance. During this period settlement would have been seasonal and impermanent, leaving few traces and this was clearly no more than a short-lived occupation. The area occupied may have been particularly suitable for such settlement, being level and within a slight natural bowl on the hill, giving some shelter and within a short distance of water at the Afon Cegin. However, most of the development area would be equally suitable and such activity might be found almost anywhere within it. Unfortunately, the features associated with such activity are generally shallow and so cannot be detected by geophysical survey but must be identified by observation after topsoil stripping. The only other non-intrusive approach is by systematic surface collection after ploughing or by widespread test pitting, which may identify lithic scatters. Surface collection has rarely been carried out in north-west Wales because most areas, like these fields, are semi-permanent grassland. Such collection as has been carried out (Smith 2000) suggests that surface scatters of flint are so few and sparse that systematic surface collection or test-pitting would only be viable where the presence of quantities of flint was already demonstrated. Previous casual visits to ploughed fields around Llandegai, including the field east of the henge complex, the subject of the 1992 geophysical survey, and one field further to the south of the A55 indicate that worked flint is rare in the area (Smith 2000). This is in accord with the evidence from the 1966-7 excavations, which despite the large areas and number of features excavated, produced very low numbers of worked flints.

5.1.2 Early Neolithic settlement

The Llandegai excavations revealed a rectangular group of post-holes interpreted as the remains of a single large timber house, associated with pottery of Early Neolithic date, *c.* 4000-3600 cal B.C. Within this period communal burial monuments - megalithic chambered tombs within stone or earthen mounds - were typical and elsewhere in Britain the later henges are often found to have been situated close to one or more such monuments. There are several chambered tombs on Anglesey and others in the Conwy Valley but the only possible example near to here is of uncertain attribution, in an unusual location on a steep slope at Sling, Tregarth, 4km to the south-east. However, such monuments did not always survive in a lowland landscape that was later intensively cleared for agriculture. There is also an antiquarian record of a possible chambered tomb about 2.5km to the north-east on what is now the Lavan Sands, but which may have been coastal lowland at a time of slightly lower sea-levels in the Early Neolithic period (Williams 1806, 206). However, this identification has not been verified. In areas devoid of stone, tombs might be of just earth and timber construction and so be even less likely to survive. There is a high probability that one or more examples of chambered tombs did once exist somewhere in the vicinity of Llandegai but by comparison with other henge complexes more likely to be at some distance, beyond a kilometre, beyond the development area.

The presence of the Neolithic house at Llandegai shows that there was permanent settlement here and probably set within an area of open land, with pasture or even arable fields close by. Henge A, to the north, had traces of its bank surviving, which sealed a soil level that provides some information about the pre-henge environment, since Henge A was the earlier of the two henges. The range of pollen preserved within the buried soil suggested that 'the henge was constructed in an essentially open landscape, with virtually no tree or shrub cover…' (Dimbleby 2004). Lynch observed that oak and hazel charcoal was found in the buried soil, although this could have been introduced as firewood. There was no cereal pollen and Dimbleby concluded that it was most likely that the area was under pasture, rather than arable. The pollen was only well preserved at the buried soil surface and there was evidence of soil mixing so no analysis of vegetation progression was possible. The data may illustrate only the immediate pre-henge environment, not necessarily that relating to the occupation of the house, which may have been 300 years before the construction of the first henge. However, the complete absence of tree or shrub pollen seems to suggest that the soil belonged to a period of continuous human activity, especially since 300 years would have been sufficient to allow natural regeneration of the woodland unless the area continued to be kept clear, deliberately or by grazing.

At about the time when the Llandegai house was occupied the environmental evidence from both the other nearest pollen studies provides a similar picture. At Llyn Cororion at around 4985 +/- 65 BP (SRR 3469) and at Nant Ffrancon at around 5050 +/- 70 BP (Q 904) there was a distinct decline in Elm. At Llyn Cororion this was accompanied by a sharp decline in Lime, a temporary decline in Oak and there were a few occurrences of *Plantago* and slight increases of Gramineae and Cyperaceae. These could all indicate increased opening up of the woodland by man. The data from Llyn Cororion is the most relevant to Llandegai, being closest and in similar lowland, but it provided no absolute evidence of arable agriculture at this time as no cereal pollen was found. However, cereal pollen has a very local dispersal rate and the absence of arable growing in the immediate vicinity would not be surprising, whatever was happening at Llandegai. The development area at its closest is only 250m from the Llandegai house and it would be reasonable to expect clearance and other activity right across this topographic area, at least within the slight plateau defined by the ridge at the east side of the area.

5.1.3 Neolithic ceremonial activity

The main phase of activity at Llandegai was that of ceremonial activity in the Middle and Later Neolithic, between about 3200-2000 cal BC. This followed the use of the house by about 300 years, so may have been unconnected. It was represented by two large earthwork circles, the henges, and other smaller circular features (Fig. 3). The first henge to be constructed was Henge A, at the north side of the present industrial park, the second, Henge B at the south, only 250m from the edge of the development area. The henges were used for ceremonial activity that can only be guessed at but included funerary deposits and other presumably ritual deposits of human and animal bones and manufactured objects. Their construction involved huge amounts of labour and so must be regarded as communal monuments associated with a significant population and focal points for social activity. However, whether this was a resident local population, of which there is so far no evidence, or a dispersed or even mobile population that came together only at special times is not known. Evidence of settlement associated with henges is as yet unknown in the British Isles. Seven known 'henge complexes', as opposed to single monuments are known from Britain and all these complexes seem to have been long-lived foci of funerary or ritual activity judging by the number of other contemporary or later monuments that occur close to them (Harding and Lee 1987, 43-4).

Three other monuments were constructed in this period, two circular ditched features and a 'cursus' – a double-ditched linear monument. One of the circular monuments was 'hengiform' - a circular ditch of similar design to a henge, with two opposed causeways, but relatively small (Fig. 1, Circle D). The cursus was 170m long and aligned approximately WNW-ESE. It lay 210m to the east of and apparently deliberately aligned on the other circular monument, a circular ditched enclosure, *c.* 40m diameter. The association between the cursus and enclosure was supported by the fact that the enclosure had a single entrance that was itself aligned on the cursus and by the radiocarbon dates from the two monuments, which were statistically identical. The geophysical survey in 1992 identified the continuation and termination of the cursus where there was another small circular feature, interpreted as a possible burial mound. If so then a date closely contemporary with the cursus is likely, while the cursus was still a visible monument. The relatively slight and simple construction of the cursus, compared to the two henges, and its centrality to the complex would favour it as being a primary element. However, the radiocarbon dates for the cursus and

Circle D indicate that they were built after at least the northern henge. Excavation at three other henge complexes, Thornborough, N. Yorks, Maxey, Cambs. and Dorchester, Oxon., has shown the cursuses there to be stratigraphically earlier than henges (Vatcher 1960, Pryor *et al* 1985, Atkinson *et al* 1951, Whittle *et al* 1992). Whatever the relation between the two henges and the cursus/enclosure at Llandegai, their alignments were totally different, suggesting that they were of different periods and the spacing between them tends to suggest that they were built to respect each others position.

Although henges were not constructed in prominent positions in the landscape they were located in topographically specialised positions - in relatively level areas. Such areas were obviously suitable for the construction of large earthworks and allowed them to be 'displayed' within a spacious, open setting. The locations were in lowland and often close to rivers in places that could have been focal, accessible points for population and here, within easy reach of the sea at Aber Cegin. Their plan in most cases includes an element of deliberate orientation, with entrances mostly in the north-west to south-east arc, with 21 out of 42 known henges being oriented within the NW/NNW to SE/SSE arc. However, as at Llandegai, a significant proportion, 11 out of 42, have an orientation within the WSW/W to ENE/E arc (Harding and Lee 1987, 37). The closely similar orientation of the two Llandegai henges suggests deliberate design.

The henges lie between two rivers, the Cegin and the Ogwen and although the Ogwen is the larger the orientation is clearly to the Cegin since both henges lie on the west side of the plateau, directly above the Cegin while they are separated from the Ogwen by some distance and a rise in ground (Fig. 2). A formal connection certainly existed between some henges and nearby rivers, as at Stonehenge, which was connected to the Avon by an avenue at a later stage in its life, and others, such as Durrington Walls and Marden physically adjoin rivers so have an obvious association. It has been suggested that henges may have had a symbolic or ceremonial association with rivers concerned with fertility (Harding, 54-6). At Llandegai, even at high tide only the Ogwen could have provided a somewhat navigable inlet. There may have been a route between the henges and one or both rivers at Llandegai but this is not borne out by any known features. If there were, however, it would have crossed to the north of the development area.

Lynch (2004, 23) observed that the area of the henges was something of a natural 'amphitheatre', overlooked by slightly higher ground around, which includes that of the development area, so activity peripheral to the henges could well be found there. Some of it on the top of the ridge is quite level and so still suitable for monument building, while the majority has a gentle slope that may have been better drained and more attractive for settlement or agriculture so must be regarded as having good potential for prehistoric activity. Henges elsewhere in Britain have activity occurring within a considerable distance around them. Double rows of pits have been found at Thornborough, N. Yorks. Milfield, Northumberland and Fonteviot, Perthshire in each case about 200m away from each henge. At Little Bromley, Essex and Groat Haugh, Northumberland the henges have lines of pits about 250m away, possibly stone or post-holes apparently associated with the henge orientations. At Yeavering, Northumberland, there is a large standing stone about 130m away from the south-east entrance (Harding and Lee 1987). By comparison with elsewhere, it might be said that other Neolithic ceremonial structures associated with the henges at Llandegai might be expected anywhere within about a 250m radius of them. This area just fringes the north side of the development area and happens to be about the edge of the plateau basin on the south side (Fig. 3). Using the same argument, further Neolithic activity might be expected on the north side, where the plateau continues into Park Penrhyn, an area that has not yet been studied. There are three other cases where three henges are found in an approximate line, at Knowlton, Dorset, Thornborough, North Yorks and Priddy Circles, Somerset. A third large henge could therefore exist to the north or to the south of the two Llandegai henges, though this would not lie within the development area.

By contrast with ceremonial structures there is some evidence that more common-place activity did not take place around henges. They may have existed in a 'special place' devoid of contemporary occupation or other activity (Harding 2003, 60). Extensive surface collections have taken place in the Stonehenge area, Wilts. and around Thornborough, N. Yorks. These show that later Neolithic lithics occur at a distance of 0.5km or more in each case. At Thornborough, the nearest substantial collection occurred 0.75km away on Chapel Hill. The collection there also had low levels of use-wear and a variety of raw materials. These suggested short term settlement and wide contacts, perhaps as a result of a nomadic lifestyle. If the 'special place' idea is correct then we would conclude that the area of the new development would be unlikely to contain later Neolithic settlement activity.

5.1.4 Early Bronze Age funerary activity
In common with other henge complexes in Britain, the Llandegai area was also used for funerary and ritual activity in the second millennium BC. Both henges had cremations or other deposits of Early Bronze Age date and there was a burial mound (F), which itself had a long period of use, having two periods of construction. Aerial photographs (RCAHMW 1964, 126) and subsequently geophysical survey (Stratascan 1992) identified further prehistoric activity to the east of the henges, including a continuation of the cursus and three, or possibly as many as five more circular features that may represent Bronze Age burial mounds, varying from 10 to 20m diameter (Fig. 1). Two other possible ring ditches have been identified on aerial photographs of Park Penrhyn, to the north-east (Fig. 2). In Gwynedd generally such mounds are found most frequently in higher, prominent positions and other mounds might be therefore be expected on the ridge to the south-east, within the development area. The nearest other known monument of this period is that of Carnedd Howel, at Llys-y-gwynt, about 1km to the south (Fig. 2, PRN 30). However, in lowland areas such mounds are usually of earth not stone and most often are reduced to subsoil features after millennia of ploughing and so are not visible in the modern landscape except as crop marks in aerial photographs.

At Llandegai, an estate map of 1768 (Fig. 3) shows a field at the south-east side of the henge complex called Cae Main Hir (Field of the Long Stone). This indicates that there was once a standing stone there. This is likely to have been introduced since the fields here are free from large glacial stones. The stone would probably have been incorporated within one of the field boundaries and perhaps most likely was at the side of the road that then crossed this area. It is possible that it was a Medieval waymarker or even Roman milestone but considering its proximity to the henges is more likely to have been of the Early Second Millennium BC and associated with the later use of the henge complex. The former field Cae Main Hir overlay the position of two of the probable burial mounds located to the east of the henges on aerial photographs and by geophysical survey (Fig. 3). Unfortunately there is no record of the stone itself and it must have been removed when the field pattern was reorganised in the early 19th century.

Although the henges have evidence of continued use in the second millennium, they may have also continued to operate as 'special places' devoid of contemporary activity in the same way as in the later Neolithic period (Parker Pearson and Ramilisonina 1998). It was observed that at Stonehenge, although situated in an area with the largest grouping of Bronze Age burial mounds in Britain, only about 20 such mounds are sited within visibility of Stonehenge, with most groups situated on the very horizon or beyond. The same was observed to be true at the henge at Avebury, which also has many burial mounds around, but none closer than 2km. However, the location could simply result from the burial mound builders' preference for higher ground rather than specific avoidance of the lower ground. Whatever the reason, we should be more likely to find second millennium burial features on the ridge at the east of the development area than on the slopes and more level land to the west.

5.1.5 Middle and Later Bronze Age activity
While the henges apparently retained some ceremonial significance into the early second millennium there then seems to have been a complete lapse in burial or other activity for a millennium or more, although there have been several finds of bronze tools of the later second millennium BC not far away (Fig. 2). These finds suggest that there was an important route crossing the area, or that the area was becoming more fully cleared and settled. It was not until about 1250 cal BC, i.e. in the Middle Bronze Age, at Llyn Cororion that there was the first definite evidence of arable agriculture, in the form of cereal pollen as well as Plantago and increased inorganic sedimentation in the lake, suggesting silting from cultivation (Watkins 1990, 136). There is no evidence to suggest that occupation or funerary activity of this period would be found in the area of the proposed development except that the palaeo-environmental evidence indicates that the local area was starting to be farmed and therefore settled, and the soils at Parc Bryn Cegin were as agriculturally favourable as most.

5.1.6 Iron Age settlement
The next phase of activity at Llandegai was the re-use of the earthwork bank of henge A as an enclosure for a large roundhouse, probably from around the middle of the first millennium BC. There were no finds to provide evidence of date or function, but the type of settlement and the absence of Romano-British material indicates that it was entirely pre-Roman and was not modified and continuously used into the Roman period as was often the case with other similar settlements. The large size of the house, 15m in diameter, suggests some status. The henge ditch however, was not re-cut at

this time, suggesting that the bank was not reinforced to create a defensive enclosure. The absence of cereal grinding stones (querns) from the house could reflect its status or, as Musson suggests, indicate that the settlement was pastoral rather than arable-based. However, the settlement included a number of four-post structures, sometimes interpreted as granaries, although they could also have been fodder stacks. The presence of the house indicates a domestic situation and so the area around can be expected to have been well cleared and used for agriculture. If this was a house of a socially high ranking person then there would be likely to be other houses of lesser status nearby and there certainly would be fields or stock enclosures within the development area.

5.1.7 Romano-British settlement

Probably after a period of abandonment the largely silted-in ditch of Henge A at Llandegai was used as the site for a small timber building of uncertain form in the late first or early second century AD, associated with Romano-British pottery and furnaces for some craft activity. There were also traces of small ditches or gullies, possibly for associated fields, suggesting that this was an agricultural settlement. This was not a long -lived period of activity, and suggested by Davies to be belong with the phase of military activity associated with the Roman incursion into the area to subjugate Anglesey in 77 AD (Davies 2004, 105). The nearest Roman road passed about 1km to the south of the development area, connecting the fort of Caerhun, Conwy with that of Segontium, Caernarfon. There are no known Roman sites within the Bangor area although it might be suspected that there would have been at least a ferry crossing to Anglesey and perhaps a signal station. One of the east-west roads that crossed the henge area in 1768 (Fig. 3) could have had early origins but there is no reason to suspect that there would be any more widespread related activity of the Roman period here.

5.1.8 Early medieval cemetery

The next identified use of the Llandegai area was for an extensive inhumation cemetery in the early Medieval period. There were no artefacts or other method of dating but it was expected to have been in use sometime between the 6th to 10th centuries AD. The cemetery was created over the line of the former Neolithic cursus ditches but without regard for its orientation. The ditches by that time were totally silted up and may not have been visible. Longley (2004, 113) suggested that the cemetery was located there because of some local tradition of antiquity for that particular area (the henge circles and burial mounds would still have been quite obvious features). Perhaps as important, the area was likely to be one that was not used for agriculture and so was available for burial, it may have been adjacent to a road and a fringe area to the actual settlement, which must have been somewhere close by. The cemetery was quite large by comparison with other such cemeteries and was suggested to have belonged to a small community of perhaps three or four farms. This could have been just a dispersed community although later a focus developed somewhere close by. The present church at Llandegai was built in the 14th century but Lynch (2004, 115) notes a 16th century record of an earlier church at an unidentified place called Cae Meusyn Glassoc, about two bowshots distance from the present church. A bowshot was commonly used as an approximate measure and taken to be about 220 yards (10 chains). The early church would therefore have been about 400m from the present church and so was unlikely to have been within the development area.

5.1.9 Medieval and Post-medieval settlement and agriculture

Lynch points out that the Llandegai area was one that was relatively attractive for arable agriculture compared to other areas of Gwynedd, with deep, relatively stone free soils and gentle slopes. The development area was therefore likely to have been used for arable farming in all periods. Despite this there is so far little evidence of early use apart from the area immediately around the henges. The area to the east of the henge complex was studied in detail by the geophysical survey of 1992. A continuation of the cursus was identified as well as several circular features, possible burial mounds. The survey also identified several linear features, the remains of tracks and field boundaries of an earlier field pattern, the details of which are fortunately preserved in the earliest map of the area made for the Penrhyn estate in 1768 (Fig. 3). The trial geophysical survey of the present development area in 1999 however did not identify any clear prehistoric features although it did identify several features belonging to the 1768 field pattern (Fig. 4). A few linear features that did not entirely match the field pattern of the 1768 map were remnants of a slightly altered field pattern shown on another Penrhyn estate map of 1841 (Fig. 5). By the time of the 1891 Ordnance Survey map the fields had been changed to the present rectilinear layout. In the area shown in Fig. 4 only one short length of boundary has retained the same line as in 1768 up to the present day. This was the curving boundary at the west side of Viaduct Covert.

Both the 1992 and 1999 geophysical surveys did identify a few features that were not readily explained as possible prehistoric funerary features or by the early estate maps. The 1992 survey identified part of a ditched enclosure at the north-east of the area (Fig. 1) and the 1999 survey identified another curvilinear feature that could be part of another ditched enclosure at the east edge of the development area (Fig. 4 Feature 4). Neither relates to the boundaries of the 18th century field system and so could be earlier features.

The 1768 map gives some clues to the history of the area, through the pattern of fields and their names. The pattern is very irregular compared to that of the modern fields because it was not the result of an overall deliberate design but developed organically. The general sweep of the pattern reflects the topography of the land in contrast to the pattern laid down in the 19th century, which was designed with the aid of a map and largely ignores the topography. The 1768 pattern probably had its origins in the Medieval period although fragments of earlier fields and settlement enclosures may be incorporated and survive. In some areas there would have been a scatter of individual homesteads as isolated clearances with small infields of arable bordered by larger enclosures for stock. These might have expanded over time so that areas of fields coalesced until the whole landscape was a complex pattern of fields. In other areas there would have been communal fields belonging to a settlement and divided into strips. There seem to have been two of the latter type of settlement here. One was at Llandegai village where there is a field with an unusual curvilinear boundary and with a field name Talarau – '(plough) headlands' that may indicate an area of former (Medieval) strip fields. Part of this field lies within the development area. The other probable settlement was just to the south of the development area where there was a building in 1768 although now only a well and spring survive (Fig. 3). Adjoining this was a small, partly curvilinear field with the name Cae Gwenith – 'Wheat field' and remnants of narrow linear fields just to the east, one of which had the name Llain – ' line or strip' indicating that there may have once been a community there, rather than a single dwelling.

Some of the field names indicate their use and show that not all the land was of good quality and suitable for ploughing but rather for hay or pasture. Gweirglodd – 'Meadow' occurs several times. The largest field in the development area is Cors y rhos – 'Marsh of the moor' and another field north of the development area is Cae banhadlog – 'Field full of Broom'. In the centre of the development area is a field called Cae'r drws – 'The field of the gate'. This is a name commonly given to the first field by a farmyard and so could indicate that there was once a dwelling close by. The field names adjoining this field may also support this idea – Llettur Offeiriad – 'Lodging of the priest' and Cae'r fynnon – 'Field of the spring'. The dwelling may have been where there is a small unexplained rectangular-shaped offset at the east edge of Cae'r drws, close to the road and this is an area that deserves closer investigation and may be illuminated by the full geophysical survey. However, the 'Drws' or 'Gate' name is also used for settlements that lie at the edge of the better land, usually on the edge of the moorland and this could apply here, because of the poorer land to the west – Cors y rhos.

5.1.10 General methodological conclusions from the 1966-7 excavations and geophysical survey

A geophysical survey of part of the henge complex was undertaken in 1966 prior to excavation but the results 'were judged to be unhelpful' (Lynch 2004, 20). After excavation, however, it was realised that the confusing results were because of a complexity of features, rather than background interference (Lynch, pers. com.). The subsequent geophysical surveys of 1992, 1999 and 2005 have proved that such survey is informative.

The Llandegai site was first discovered from aerial photographs taken in 1960 during a period of exceptional drought. This showed up features in the grassland as darker marks where the grass had stayed greener over subsoil features. These ditches and pits contained more humic fill and retained more moisture than the surrounding natural gravel. Apart from the regular circles and lines of obvious archaeological features the photographs showed was a network of meandering curvilinear across the whole area. On excavation these proved to be periglacial frost cracks and it was possible to distinguish these from linear archaeological features such as field boundary ditches. However, it was pointed out that 'the surface of the natural gravel was highly variable in texture and colour.' (Lynch 2004, 37) causing some problems of identification of features and similar difficulties can be expected during any work in the new development area.

Excavation was carried out by area topsoil stripping by machine, at the time a new technique. This involved first the removal of 0.4-0.45m of topsoil, consisting of 0.25m of recent ploughsoil and 0.15-

0.20m of lower ploughsoil, a 'stony humus'. Numerous features showed up at this stage, i.e. before the area had been reduced to 'clean' natural subsoil. However, the features were diffuse and difficult to define so after initial planning a further 0.20-0.25m was removed to expose the surface of the subsoil. In all therefore about 0.6-0.7m was removed before excavation. The lower subsoil was taken to be a preserved but disturbed earlier horizon, possibly a medieval ploughsoil (Lynch 2004, 37). Fortunately, excavation of Henge A (Fig. 1) showed that remnants of the internal bank had survived, protecting an area of pre-henge land surface (Lynch 2004, Figs 15 and 17) indicating that elsewhere on the site, not protected by the henge bank, subsequent medieval and post-medieval ploughing had reduced the levels to about 0.20m below the level of the Neolithic ground surface so only the lower parts of features survived.

The preservation of archaeological features in the area of the henge complex was relatively good, partly because of the level nature of the ground, which prevented colluvial movement during ploughing and partly because of the amount of residual material from banks. This contrasts with the present development area where shallower topsoil depths are recorded across the whole area than seems to have been the case in the area of the henge complex.

5.2 The 1992 geophysical survey and its implications

Magnetometer and resistivity surveys were undertaken of the area to the east of the henge complex to assess the likelihood of further features there, an area that might be required for further industrial development (Fig. 1) (Stratascan 1992). Both surveys were effective in identifying a variety of anomalies. Most anomalies were identified by both methods although each identified a few that the other did not. Overall the magnetometry was most productive as resistivity is affected by damp soil conditions, encountered here and problematic on clay-rich soils as on the whole of the development area. Of the numerous anomalies recorded the most obvious were post-medieval field boundaries and tracks. There were other linear features, some of which are likely to be periglacial features, like those recorded during the 1966-7 excavations. The most significant was a continuation of the cursus and four or five circular features of a size that suggested they might be the Bronze Age burial mounds, or the ditches of such. Three of these were only identified by resistivity. There were fewer anomalies on the east side of the area where the ground begins to slope up, supporting the idea that the archaeological activity was concentrated on the lower, plateau-like area. However, one large feature did occur at the south-east edge of the area (Fig. 1, M13) and continued beyond it, very close to the present development area. This could be archaeological, but it could also be a periglacial feature, some of which were similarly broad.

5.3 The 1999 geophysical survey

The geophysical survey carried out in 1999 (Hopewell and Davidson 1999) covered the whole of the development area by means of sample areas and provides the only information about the west part of the development area. More detailed information is now known about the eastern part of the area from a new survey in 2005 (Stratascan 2005). The two surveys will be cross-referenced where applicable.

The 1999 survey was a magnetic survey, using a gradiometer and comprised 13 areas (A – M) including 100 20m by 20m grids with a total area of 4ha, 11% of the total development area (Fig. 4). The survey areas were distributed so as to provide a reasonable sample of the whole area. The individual areas were each large enough to allow most types of archaeological features, such as ditches, buildings or burial monuments to be identified within the size range of 5 – 10m maximum dimension. However, the subsoil of deep glacial clay proved to be slightly unfavourable and did not produce clear results.

Apart from significant anomalies there were numerous faint linear features resulting from recent ploughing. The survey identified 31 more substantial anomalies. Three of these were large and diffuse and probably just geological features (in areas K and L), two were modern features and four were field drains. Fourteen were elements of earlier field systems, recorded on estate maps of 1768 (Fig. 4) or 1841 (Fig. 5), either boundaries or trackways.

There were eight features that did not fall into the above categories and so could be parts of earlier archaeological features (Fig. 4, Features 1-8). Features 1 and 2 (Area B) were respectively a probable

ditch and associated hearth. Feature 3 (Area B) was a diffuse linear anomaly, possibly a ditch or just geological. Feature 4 (Area E) was a long curving diffuse linear feature, continuing beyond the survey area. It was not identified during the 2005 survey, indicating that it belonged to an area of geological interference observed on this area (see below). Features 5-8 (Area H) comprised a group of intersecting narrow linear features described as 'probably the result of plough scarring but could represent the faint traces of earlier settlement or other activities'.

This assessment of the 1999 geophysical results has shown that several more of the identified features can be identified as part of the Post-medieval field system than were originally recognised. This is because the field system known from the 1768 estate map was partially reorganised in the early 19th century, sometime before 1891, when the present layout was recorded on the first edition Ordnance Survey 1:2560 map. However, there are still a number of features that might represent earlier activity within the development area and which require further investigation. The most notable of these is the possible curvilinear enclosure, Feature 4.

While many of the geophysical features were earlier field boundaries identifiable on the 1768 or 1841 estate maps it must also be taken into account that the irregular boundaries of early fields may have incorporated elements of even earlier boundaries, such as Medieval fields or even prehistoric earthwork features. The lines of earlier field boundaries should not therefore be ignored. Such boundaries with particularly irregular or curvilinear edges are of interest, where there are no topographic reasons for the field shapes. Here there are four areas of interest (Fig. 4, Features 9 – 12).

Boundary 9 was a long curvilinear boundary that formed a semi-circular arc at the east side of a field called Cae Gwnion (Fig. 3). The field's overall irregular, multi-facetted shape suggests that it resulted from the aggregation of several smaller fields.

Boundary 10 was another curvilinear field edge, which mirrored a similarly shaped edge at the opposite side of the field, possibly forming part of a sub-circular enclosure.

Boundary 11 belonged to a former field of unusual, almost semi-circular shape. The fields name, Talarau – 'Headlands' was interpreted above as possibly meaning that it had formerly been a Medieval strip field. However, such fields a re normally long and narrow, i.e. linear in shape. The name may also have been applied because the field contained linear earthworks that had the appearance of plough headlands but that actually were some other kind of feature. In fact the northern part of the former field included part of the area of the 1992 geophysical survey where several features were identified (Figs 1 and 3). The curvilinear shape of the field edge itself may mean that it incorporated or re-used some earlier enclosure bank.

Boundary 12 was a distinctive sub-rectangular offset of the field edge, part of which aligns with a curvilinear feature identified on the 1999 geophysical survey, which is therefore probably an earlier removed boundary (Fig. 4). The names of the fields here were interpreted (4.10, above) as suggesting that there was a dwelling close by, sometime before 1768 and the offset may derive from the access from or enclosure around that dwelling.

5.4 The 2005 geophysical survey

A further magnetic geophysical survey was carried out in January 2005 (Stratascan 2005). This survey was of the higher ground at the east side of the development area (Area 1 (Fig. 4, Fields 2 and 3, Fig. 6). The survey completed a 100% cover of this area, which provides more definitive information on the presence of archaeological remains than the smaller sample areas surveyed in 1999. However, the fields did not prove ideal for survey because responses over a large part of it were affected by variations in the natural background magnetism resulting from the underlying geology (the yellow area in Fig. 6). The geological test-pitting has shown that there is a considerable depth of glacial drift deposits over the development area, about 3m in Area 1. The natural variation was described as having two implications for the interpretation of the survey (Stratascan 2005, 6):

1. The variable magnetic background response may have obscured more subtle features with an anthropogenic origin.

2. The area of natural variation has linear and pit-like elements that are very similar to anthropogenic features.

However, despite this qualification, the survey did identify a considerable number of features. Also, the experience of the 1966 geophysical survey demonstrates implies that areas of confusing results can be archaeological not natural.

A simplified extract from the 2005 survey results is shown in Fig. 6 (Stratascan 2005, Fig. 14) and described here.

Two long straight linear anomalies are modern services, a water pipe following the north edge of the area and a gas pipe running north-west to south-east across the northern part of the area. Other straight linear anomalies are vestigial cultivation marks (Feature groups 8 and 11) or field drains (Feature groups 9 and 10). Other linear anomalies can be recognised as boundaries of the former 18th or 19th century field systems, previously discussed (Features 3, 5, 14 and 17). One group (Features 12 and 13 belongs to a droveway that led west from the farm Rhos Isaf as seen on the 1841 estate map (Fig. 8).

There were also a number of features that were less regular and somewhat unclear, which were not obviously part of the 18th and 19th century fields and so could indicate more significant archaeology. Some could still be remnants of Post-medieval agricultural activity, some could be natural in origin and some could be earlier archaeological features:

1. Feature 7. An area of magnetic disturbance with some sub-rectilinear elements. This area is similar to one identified during the 1992 survey east of the henge complex (Fig. 1), which was suggested to be possibly two or more enclosures, perhaps a stockyard, but not further investigated since. Feature 7 lies within the area where it has been suggested, above, that there may have been a dwelling, prior to 1768, on the grounds of the field name evidence.
2. Feature 4 is close to Feature 7, is a similar type of feature and part of one complex of faint features, so may be part of the same settlement area. Linear feature 5, which seems to be related to the field system seen in 1768 although not actually part of it, may belong to the same phase.
3. Feature 6, a curving linear feature at the north of the area was also thought to be a cut feature and possibly archaeological in nature. This seems to be unrelated to the earlier field systems and so is potentially an even earlier feature.
4. Features 1 and 2 form a significant and potentially important group. Feature 1 was interpreted as deriving from a cut feature, possibly forming parts of a sub-circular enclosure about 50m in diameter. The east part of Feature 1 was also located by the 1999 survey. Feature 2 surrounds Feature 1 in what seems to be a meaningful concentric pattern, about 100m diameter but was less certain in nature consisting of 'diffuse positive and negative curving areas. These area responses are often more indicative of natural magnetic variations within the top or sub soils.' (Stratascan 2005, 6). It was therefore not thought possible to posit an archaeological origin for these features. The resemblance in overall size to the two henges excavated in 1966-7 is significant. This area was also identified, above, as of greatest potential because of its proximity to the henge complex, because it is relatively level and because the 1768 field name suggested that there might have been earthworks present. The two anomalies of Feature 2 have some relationship with the layout of the field boundaries in 1841 (Fig. 8) and this could be because there were pre-existing earthworks that were re-used.
5. Features 15 and 16 are positive and negative curvilinear features suggested to be either natural or possible trackways. Feature 15 is long and meandering and is a good candidate for a track along the ridge pre-dating the road shown on the 1768 map.

Five of the areas surveyed by magnetometry in 1999 were also within the larger area surveyed in 2005 (Fig. 4, Areas C-G). In Area C all the anomalies detected in 1999 (Features 8 and 9) were seen in 2005 and confirmed as modern cultivation features. In Area D Features 1 and 6 were identified in both surveys. In Area E Features 3 and 5 were identified in both surveys but Feature 4 was not seen in 2005. As discussed above this suggests it was a background geological feature. In Area F the single feature was recorded in both surveys, now identified as part of the 18th century field system. In Area G two areas of anomalies were recorded in 1999 and 2005. The northern group is now identified as part of the 18th and early 19th century field system. The southern group, thought to be geological in 1999 was not identified in 2005 and accords with the trend of geological interference detected then.

Comparison of the two surveys shows first, that the sampling of a large area can identify individual features but provides little guide to what archaeological remains might be present in the area as a whole. Most kinds of archaeological activity, apart from field systems or trackways occupy relatively restricted areas. Secondly, where geomagnetic responses are poor or there is background geological noise it will be less easy to distinguish genuine archaeological anomalies from background noise in small survey areas.

5.5 Evidence from Bore holes and Trial pitting

A number of bore holes and test pits were cut by Geotechnics Ltd and the log data and location plan have been made available. Five bore holes and 22 test pits were cut. These were positioned so as to cover the whole of the development area in a random rather than regular pattern. The data was studied for possible relevance to the archaeological assessment. This takes the form of implications for:

a. Preservation of archaeological remains
b. Previous land use and therefore the likelihood of prehistoric or later human activity.
c. Interpretation of results from the geophysical survey

The data provided records the type and depth of topsoil and subsoil strata.

Topsoil types: The descriptions show little variation over the site. Most are of gravelly clay with a few cases of silty gravelly and sandy clayey. The similarity across the area is because the whole area has a cover of fluvio-glacial till. The topsoil varies little but because of the clay content is of poor drainage, the best drained being on the higher ground where the bedrock is higher and has greater influence and on the slightly greater slopes where natural drainage is better. The subsoil variation is more relevant than the topsoil variation.

Topsoil depth (Fig. 9): This again shows very little variation over the site, despite the differences in height and slope. The variation is between 0.1 to 0.4m but mainly at 0.3m. The shallower area of soils occurs on the slightly greater slope in the centre of the area and there are a few areas of deeper soils close to the north edge of the area.

Subsoil types (Fig. 10): There is an overall cover of fluvio-glacial till but this is very shallow on the higher ground at the east but much of the site has a cover of about 3m and there is over 5m depth at the west. At the east, where the till is very shallow the underlying shale bedrock has a greater influence on the amount of gravel in the soil and the drainage qualities. There is an area of laminated silts at the north edge of the centre of the area, where the slope approaches the more level plateau. The till, although broadly described as gravelly clay, will be locally variable, because of its fluvial origins, and will have lamina, pockets and runnels of gravel, sand and clay.

a. Preservation of archaeological remains

The even soil depths show little evidence of colluvial movement within the area. This is likely to be because the area has been used mainly for pasture with only occasional ploughing. It also partly results from the alteration in the field system in the 19th century whereby any colluvial movement as a result of earlier arable farming within the smaller fields prior to the 19th century, has been incorporated in the modern fields. This could therefore result in local variations in topsoil depth within the modern fields if negative or positive plough terraces (lynchets) previously existed along the line of former field boundaries. However, there are no obvious visible variations in the surface contours or variations in the soil depths to indicate the presence of such lynchets. The field names on the 1768 estate map suggest that the west half of the area was pasture and so may not have been ploughed. However, the field names of the west half do suggest plough land and lynchets would be most likely to occur on the greater slopes there so traces of terraces may become evident on topsoil removal. It may that the soil test pits are too widely spread to identify slight localised variations in topsoil depth. Three of the soil test pits identified possible made ground. One of these was recent in a former small enclosure close to Rhos Isaf farm. Another pit happened to fall on the line of a former field boundary that existed in 1768 but had gone by 1891. It lay between two mature trees that must be remnants of this earlier boundary and the deposits encountered were the probable remains of the levelled field bank. This shows there may be some areas of better preservation although this case was exceptional in that the presence of the trees would have inhibited plough erosion.

The shallow topsoil present means that any modern ploughing would have cut to the top of the subsoil across the whole area. There are no areas where colluvial accumulation will have caused better preservation and the top of the subsoil on the steeper slopes running south-west to north-east across the centre of the site with shallower soils will have been actively eroded depending on the degree to which arable farming has been undertaken in the recent past.

b. Previous land use

The topsoil variation is slight, the gravelly clays being just rather more gravelly in the east part of the area. This accords with the mapped soil types recorded (SSEW 1958) and the agricultural land capability (MAFF 1988). It also accords with earlier land use as identified from the field names on the 1768 estate map, with the pasture at the west and arable at the east. This land use capability is likely to be paralleled in earlier archaeological activity, the better drained land at the east would had been more attractive for settlement or agriculture and so has greater potential for archaeological remains.

c. Interpretation of results from the geophysical survey

The variation in topsoil depth alone is insufficient to affect the results. The variation in subsoil and the presence of bedrock or decayed rock close to the surface at the east of the area accords with the observed results from the 2005 survey where a large area of background interference was observed with a south-west to north-east trend, presumed to be geological. The remainder of the area to the west, still to be surveyed, can be expected to produce relatively even responses similar to those from the north-west part of the 2005 geophysical survey area.

5.6 Evidence from aerial photographs

5.6.1 Photographs held at Aberystwyth studied for the original assessment were studied again. Three rectilinear features were seen. One of these appeared to be a modern cultivation mark or drain. The other two matched with field boundaries seen on the 1841 estate map (Fig. 5). One large curvilinear feature was seen in Field 2 at the east edge of the area. This can be best explained as a field boundary ditch of a field seen on the 1768 estate map (Fig. 4).

5.6.2 Photographs held at Cambridge were studied as photocopies of the originals. These were vertical photographs taken in 1960 and 1964, concentrating on the main area of the henge complex and oblique photographs taken in 1967 and 1969 looking at the areas near to the henge complex. A few of the latter included the northern fringe of the development area but the crop conditions were not suitable to show crop marks except at the extreme north-east where one photograph (AYJ.53) shows some narrow linear features which are most likely to be cultivation marks. Two photographs (AYJ.54 and 55) show a field fringing the north side of the development area to the south-west of Viaduct Covert. Both photographs show a possible curvilinear enclosure of about 80m diameter cut by the existing road, so that a small portion of it probably falls within the development area (Fig. 11, A13). If it is an enclosure it looks somewhat irregular, like a settlement, but identification must be tentative because of the curvilinear network of periglacial features seen on aerial photographs of the henge area and confirmed by excavation. If the feature is of human origin then a prehistoric date is most likely and it will demonstrate that there are major archaeological features within at least the fringes of the development area. However, the aerial photographic evidence will need to be assessed by further investigation.

6. GENERAL CONCLUSIONS AND RECOMMENDATIONS

6.1 General Archaeological Potential

In terms of overall interpretation of the topography the ridge at the east side of the development area has the greatest potential for archaeological remains because it is closest to the known remains of the henge complex, it provides a typical location for other Early Bronze Age burial mounds, the ridge would probably have been a well-used route in all periods and lastly because the 18th century field names suggest that there may once have been a dwelling close by.

The northern edge of the development area is at the same level and fringes on the plateau on which the Neolithic henge complex was sited and so has some potential for associated activity.

The assessment is summarised in Table 2 by Period, Probability of occurrence, Feature type, Likely type of location and Method of identification required.

Table 2 Archaeological potential of development area

PERIOD	PROBABILITY	TYPE	LOCATION	IDENTIFICATION
Mesolithic activity	Low	Minor non-patterned features/surface lithic scatters	Stream sides/ Spring sides/ Ridges-West, east and Centre of dev. area -*Cae Fynnon*	Geophysics poor. Identification from surface collection or area soil stripping/excavation only
Early Neolithic settlement	Medium	Minor patterned features/surface lithic scatters	Topographically non-specific	Geophysics ID poor. Identification from surface collection or area soil stripping/excavation only
Middle/Late Neolithic ceremonial/ funerary	Medium	Major patterned features	Level areas to north and east most likely, on the very edge and beyond the development area	Geophysics ID good
Middle/Late Neolithic settlement	Low	Minor non-patterned features/surface lithic scatters	Level areas to north and east	Geophysics ID poor. Identification from surface collection or area soil stripping/excavation only
Early Bronze Age funerary	High	Major patterned features	Higher ground at east most likely	Geophysics ID good
Early Bronze Age settlement	Medium	Minor patterned features/surface lithic scatters	Topographically non-specific	Geophysics ID poor. Identification from Identification from area soil stripping/excavation only
Middle/Later BA settlement	Medium	Major patterned features	Level areas to north and east most likely	Geophysics ID good
Middle/Later BA funerary	High	Minor non-patterned features	Level areas to north and east most likely	Geophysics ID poor. Identification from area soil stripping/excavation only
First millennium settlement	Medium	Major patterned features	Level areas to north and east most likely	Geophysics ID good
Romano-British settlement	Medium	Medium patterned features	Topographically non-specific	Geophysics ID fair. Identification from area soil stripping/excavation only
Romano-British	Medium	Medium	Topographically	Geophysics ID good

craft/industry		patterned features	non-specific	
Early Medieval settlement	Low	Minor patterned features	Topographically non-specific	Geophysics ID poor. Identification only from area soil stripping/excavation only
Early Medieval burial	Low	Medium patterned features	Level areas to north and east most likely	Geophysics ID fair. Identification from area soil stripping/excavation only
Medieval/Early Post-medieval settlement	Medium	Medium patterned features	Level areas to east most likely	Geophysics ID good

6.2 Presence of archaeological features (Fig. 11)

6.2.1 Aerial photographic evidence suggests the presence of a curvilinear enclosure just to the north of and intruding slightly into the development area (A13). This may be a natural feature but requires further investigation. However, it increases the possibility of the presence archaeological activity within the area.

6.2.2 All the geophysical features identified in 1999 and 2005 that cannot be readily matched with 18th or 19th century boundaries or trackways may be archaeologically significant and need further evaluation by trial excavation. These are the 2005 survey individual features 1, 2 and 6 and group features 4 and 7.

6.2.3 Field boundaries present in 1768 may also have earlier origins or be of other significance (see 5.1.9, above). A sample of these boundary features needs to be excavated to characterise them and to look for evidence to date their origins.

6.2.4 The desktop assessment suggested that there was good potential for Bronze Age burial features within the area of the 2005 geophysical survey but the results have provided reasonable evidence that there are no burial mounds. However, cremation cemeteries, without burial mounds, could still be present. Such features would only be identified by intrusive archaeological techniques.

6.2.5 The 2005 geophysical survey report also pointed out that the absence of geomagnetic features did not prove that no archaeological features were present since such features are not always magnetically responsive, depending on their nature or the soil conditions. Sample areas, beyond the recognised features therefore need to be excavated to provide comparative evidence for interpretation.

6.2.6 The area of the higher ground at the east side of the area was identified as of highest general archaeological potential (6.1, above) yet this was the area where the 2005 survey was least effective, because of geological interference (Fig. 6). Some direct evaluation by trial trenching is therefore desirable.

6.3 Survival of archaeological features
Likely to be similar or slightly poorer than the area excavated in 1966-7 because of increased plough erosion on the sloping land.

6.4 Survival of artefactual/faunal remains
Likely to be similar to that in the area excavated in 1966-7 because of similar soils in the two areas.

6.5 Presence of environmental evidence
The area excavated in 1966-7 showed some major earthworks with remains of banks covering buried soils in which pollen survived. It is shown that pollen can survive in the soils here then. However, there is no evidence of such earthworks in the development area and so little likelihood of buried soils.

There is some potential for waterlogged survival if there are pits or ditches in the lowest, western part of the development area, where the ground is least well drained.

6.6 Approaches to mitigation

6.6.1 The desktop assessment indicates that the dense concentration of sites excavated in 1966-7 does not continue into the proposed development area. However, the features revealed by magnetometer survey, when mapped against earlier field boundaries, do reveal potential for the recovery of archaeological information that pre-dates the 18th century field boundaries.

6.6.2 The assessment has revealed that the potential for good archaeological survival is relatively poor, due to the regular ploughing that has been undertaken on the site, and the shallower depth of topsoil cover compared to that over the henge monuments. It is thus unlikely that sites identified will be worthy of preservation *in situ*.

6.6.3 In order to ascertain the status of the identified features, and to ensure that other features, not identifiable by the evaluation techniques so far used, are also identified, a programme of intrusive fieldwork is required. This could be preceded by further geophysical survey, particularly resistivity survey. In 1992, additional features were revealed by this technique, though their status was not ascertained. Given that the most effective use of resistivity survey relies upon the identification of a targeted area, and that all identified areas of potential will be sampled by trial excavation, this technique will not initially be used.

6.6.4 Intrusive evaluation techniques rely upon trial excavation of a sample percentage of the area. Whereas the sample is biased towards investigating the features already identified, it is also important to evaluate the remainder of the area to compensate for any deficiencies within the non-intrusive survey techniques.

6.6.5 Two principal approaches of investigation are considered within the Brief, though the aim of both is to identify all archaeological remains, so that appropriate mitigation can be applied. In the majority of cases mitigation will consist of detailed excavation. No reason for the choice of technique is given, but the Brief suggests that 'strip, map and sample' should be undertaken within the infrastructure corridor that includes the proposed access road and services, and that evaluation of individual features should be undertaken over the remainder of the site. No specific recommendations are made for the areas of the site where features have not been identified.

There are advantages and disadvantages of both techniques. Strip, map and sample relies upon complete stripping of the topsoil within the development area, to be supplemented by more detailed examination of those areas that appear to contain archaeological remains. The principal advantages of this technique are that the areas for detailed examination can be better targeted, as the full extent of the area devoid of its soil covering can be examined. However, there are also disadvantages of the technique. It does not work well where the topsoil depth is variable, nor does it work well in areas where glacial boulders remain protruding above the subsoil. Neither of these should be a problem at Parc Bryn Cegin, as the soil depth is relatively even, and the ground appears free of boulders. Another disadvantage, however, is that in order to identify the archaeology it is necessary to clean down onto a recognised layer, which in this instance is likely to be the natural glacial clay. Whereas this will allow identification of features cut into this layer, it could also remove sensitive archaeological deposits remaining at a slightly higher level. Using trial trenches to investigate specific features can overcome this disadvantage, because cleaning can be undertaken by hand from a higher level.

Both techniques could be used with advantage. Specific features already identified could be examined by trial excavation, and larger areas where there are fewer features, or perhaps where there are groups of features, could be stripped. Undertaking a number of trial excavations first could help develop a

greater understanding of the soils and the manner in which archaeological features are represented within the natural clays. This would aid the methodology to be employed when undertaking the strip, map and sample technique.

6.6.6 A project design will be prepared that will contain a specification of works for the next phase. The design will be based upon the original brief, the findings of this assessment, and upon comments received from the Development Control archaeologist.

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7.2 Non-published sources

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PARC BRYN CEGIN, BANGOR

APPENDIX 1

DESIGN BRIEF FOR ARCHAEOLOGICAL MITIGATION

DESIGN BRIEF FOR ARCHAEOLOGICAL MITIGATION

Gwynedd Archaeological Planning Service

Site: Parc Bryn Cegin, Llandygai, Bangor

Applicant: Welsh Development Agency

Date: 7 September 2004

Planning reference: C00A/0361/16/AM

National Grid Reference: 259230 370520

This design brief is only valid for six months after the above date. After this period Gwynedd Archaeological Planning Service should be contacted.

It is recommended that the contractor appointed to carry out this programme of archaeological works visits the site of the proposed development and consults the Regional Sites and Monuments Record (SMR) for north-west Wales before completing their specification. Gwynedd Archaeological Planning Service cannot guarantee the inclusion of all relevant information in the design brief.

Key elements specific to this design brief have been highlighted.

1.0 Site Location and Description

1.1 For the purposes of this brief the site comprises land on the southern outskirts of Bangor, as shown on the application site plan accompanying planning application C00A/0361/16/AM.

1.2 This plot of land comprises an area of approximately 36 hectares, currently an area of open agricultural land.

1.3 Bangor is located on the north coast of Gwynedd, within the valley of the Afon Adda, and is the largest commercial centre in Gwynedd.

2.0 Archaeological Background

2.1 An archaeological evaluation, comprising a desktop study and partial geophysical survey (4 hectares total = 11%), was carried out in 1999 to accompany the planning application (Davidson & Hopewell 1999).

2.2 The evaluation was carried out because the development lies within an area of high archaeological potential. Parc Bryn Cegin will be an extension of Llandygai Industrial Estate, which lies to the north. Excavations in advance of its construction in the late 1960s revealed one of the most important archaeological discoveries in Wales in recent times: an extensive, multi-period site which included a group of Late Neolithic monuments, an Iron Age settlement and an early Christian cemetery.

2.3 For a full summary of the archaeological and historical background the original studies need to be consulted.

2.4 Documentation

Davidson, A. & Hopewell, D. 1999. Parc Penrhyn Project, Llandegai, Bangor. Archaeological evaluation. Gwynedd Archaeological Trust. Unpublished report 331, held by the Sites and Monuments Record, Gwynedd Archaeological Trust.

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3.0 The nature of the development and archaeological requirements

3.1 The development obtained outline planning permission in 2000 for the use of land for class B1 and B2 purpose, and the provision of new access, infrastructure and planting. Planning consent was granted subject to a number of conditions, including an archaeological condition requiring a programme of archaeological works.

3.2 This is a design brief for a programme of archaeological works to be undertaken following planning consent, according to guidelines set out in Welsh national planning guidance (*Planning Policy Guidance Wales 2002*) and Welsh Office Circular 60/96 (*Planning and the Historic Environment: Archaeology*).

3.3 This will comprise a programme of archaeological works to ensure **preservation by record (excavation).**

3.4 The object of this programme of archaeological works is to mitigate the impact of the development on archaeological remains.

3.5 This *design brief* should be used by the archaeological contractor as the basis for the preparation of a detailed written archaeological *specification*. The specification must be submitted to the Gwynedd Archaeological Planning Service for approval before the work commences.

3.6 The *specification* should contain, as a minimum, the following elements:

- Non-technical summary.
- Details of the proposed works as precisely as is reasonably possible, indicating clearly on a plan their location and extent.
- A research design which sets out the site specific objectives of the archaeological works.
- Reference to the relevant legislation.
- Health and Safety considerations.
- Monitoring procedures.
- Field methodology.
- Methods of recording, including the collection and disposal strategy for artefacts and ecofacts.
- Arrangement for immediate conservation of artefacts.

- Post-fieldwork methodology.
- The level and grade of all key project staff.
- Details of all specialists.
- A timetable for the proposed works including contingency costs (if appropriate).
- The intended method of publication.
- Archive deposition.

4.0 Programme of archaeological works (detail)

4.1 The programme of archaeological works to **mitigate** the impact of the development will comprise a phased approach, to include:-

- Mitigation phase 1: re-evaluation of previous work, including the archaeological evaluation carried out in 1999 (see 4.2 below).
- Mitigation phase 2: consideration of extending the use of geophysical survey (see 4.3 below).
- Mitigation phase 3: programme of excavation where archaeological remains are potentially threatened by the proposed development (see 4.4 below).

4.2 **Mitigation phase 1: re-evaluation of previous work**
Re-evaluation of the desk-based assessment and geophysical survey results in the light of the following sources of information:

- 'A Prehistoric and early Mediaeval Complex at Llandegai, near Bangor, North Wales: Excavations directed by C.H. Houlder 1966-67', edited by Frances Lynch and C.R. Musson, to be published by *Archaeologia Cambrensis* volume 150.
- Detailed soil and geological information, including bore-hole data.

4.3 **Mitigation phase 2: geophysical survey**
A decision to extend the use of geophysical survey should be made in the light of an analysis of the three previous surveys conducted in 1964, 1992 and 1999 respectively. If the technique is determined to be effective, 100% of the land area where archaeological remains are potentially threatened by the proposed development must be surveyed. Ground disturbance is taken to include landscaping, excavation for services and other ancillary works, as well as excavation for foundations.

4.4 **Mitigation phase 3: excavation**
The object of excavation is to create an archive record (preservation by record) of archaeological deposits or structures.

4.5 The area subject to excavation should consist, as a minimum, of:

- excavation, comprising, 'strip, map and sample' of the infrastructure corridor (roads and services built in advance of any business plot development);
- evaluation and, where necessary, open-area excavation, of anomalies identified in the 1999 geophysical survey;

- evaluation and, where necessary, open-area excavation, of anomalies identified as a result of any further programme of geophysical survey and assessment.

4.6 Excavation methodology should be in accordance with Institute of Field Archaeologists guidance (see general requirements below). The use of metal detectors on site to aid the recovery of artefacts is encouraged. Recording will comprise appropriate plans, elevation and photographs.

5.0 Results

5.1 The archaeological contractor must ensure that sufficient resource is made available for a post-excavation programme to result in an archive report.

5.2 The results must be presented in a report and should be detailed and laid out in such a way that data and supporting text are readily cross-referenced.

5.3 **The SMR Officer should be contacted to ensure that any sites or monuments not previously recorded in the SMR are given a Primary Recognition Number (PRN) and that data structure is compatible with the SMR.**

5.4 A deposit model should be presented graphically in plan and, where appropriate, in profile and at a scale that is commensurate with subsequent use as a working document.

5.5 The archaeological report should specifically include the following:

a) a copy of the design brief and agreed specification,

b) a location plan,

c) all located sites plotted on an appropriately scaled plan of the development,

d) a gazetteer of all located sites, including full dimensional and descriptive detail,

e) a full bibliography of sources consulted.

6.0 General requirements

6.1 The archaeological assessment must be undertaken by an appropriately qualified individual or organisation, fully experienced in work of this character. Details, including the name, qualifications and experience of the project director and all other key project personnel (including specialist staff) should be communicated to the development control archaeologist and all written work attributed to an author (s).

6.2 Contractors and subcontractors are expected to conform to standard professional guidelines, including the following:-

- English Heritage's 1991 Management of Archaeological Projects (MAP2).
- The Institute of Field Archaeologists 1985 (revised 1997) Code of Conduct.
- The Institute of Field Archaeologists 1990 (revised 1997) Code of Approved Practice for the Regulation of Contractual Arrangements in Field Archaeology.

- The Institute of Field Archaeologists 1994 (revised 1999) Standard and Guidance for Archaeological Desk-Based Assessment.
- The Institute of Field Archaeologists 1994 (revised 1999) Standard and Guidance for Archaeological Watching Briefs.
- The Institute of Field Archaeologists 1994 (revised 1999) Standard and Guidance for Archaeological Field Evaluation.
- The Institute of Field Archaeologists 1995 (revised 1999) Standard and Guidance for Archaeological Excavation.
- The Institute of Field Archaeologists 1996 (revised 1999) Standard and Guidance for the Archaeological Investigation and Recording of Standing Buildings or Structures.
- The Institute of Field Archaeologists 1999 Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials.
- Museum and Galleries Commission 1994 Standards in the Museum Care of Archaeological Collections.
- United Kingdom Institute for Conservation 1990 Guidelines for the Preparation of Excavation Archives for long-term storage.

6.3 Many people in North Wales speak Welsh as their first language, and many of the archive and documentary references are in Welsh. Contractors should therefore give due consideration to their ability to understand and converse in Welsh.

6.4 Where relevant, specialist studies of environmental, economic and historical data must include a *statement of potential*. All specialist reports used in the preparation of this study must be reproduced **in full** in the desk-based study.

6.5 A full archive including plans, photographs, written material and any other material resulting from the project should be prepared. All plans, photographs and descriptions should be labelled, cross-referenced and lodged in an appropriate place (to be agreed with the archaeological curator) within six months of the completion of the project.

6.6 Two copies of the bound report must be sent to the address below, one copy marked for the attention of the Development Control Archaeologist, the other for attention of the SMR Officer, who will deposit the copy in the SMR.

6.7 The involvement of Gwynedd Archaeological Planning Service should be acknowledged in any report or publication generated by this project.

7.0 Glossary of terms

7.1 *Archaeological Contractor*
A professionally qualified individual or an organisation containing professionally qualified archaeological staff, able to offer an appropriate and satisfactory treatment of the archaeological resource, retained by the developer to carry out archaeological work either prior to the submission of a planning application or as a requirement of the planning process.

7.2 *Archaeological Curator*
A person, or organisation, responsible for the conservation and management of archaeological evidence by virtue of official or statutory duties. In north-west Wales the archaeological advisor to the Local Planning Authorities is the

development control archaeologist, who works to the Welsh Archaeological Trust's Curators' Code of Practice.

7.3 *Archive*
An ordered collection of all documents and artefacts from an archaeological project, which at the conclusion of the work should be deposited at a public repository, such as the local museum.

7.4 *Assessment*
A desk-based archaeological assessment (also known as a *desk-top assessment*) is a detailed consideration of the known or potential archaeological resource within a specified area or site (land-based, intertidal or underwater), consisting of a collation of existing written and graphic information in order to identify the likely character, extent, quality and worth of the known or potential archaeological resource in a local, regional or national context as appropriate.

7.5 *Brief*
The Association of County Archaeological Officers (1993) defines a *brief* as an outline framework of the planning and archaeological situation which has to be addressed, together with an indication of the scope of works that will be required.

7.6 *Evaluation*
A limited programme of non-intrusive and/or intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site; and, if present, defines their character and extent, and relative quality. It enables an assessment of their worth in a local, regional, national or international context, as appropriate. The programme of work will result in the preparation of a report and archive.

7.7 *Sites and Monuments Record (SMR)*
A documentary record of known sites in a given area. In north-west Wales the SMR is curated by the curatorial division of the Gwynedd Archaeological Trust.

7.8 *Specification*
The Association of County Archaeological Officers (1993) defines a *specification* as a schedule of works outlined in sufficient detail to be quantifiable, implemented and monitored.

7.9 *Watching brief*
A formal programme of observation during non-archaeological excavation works in order to identity, investigate and record any Archaeological Remains which may be present, in accordance with the Archaeological Standards.

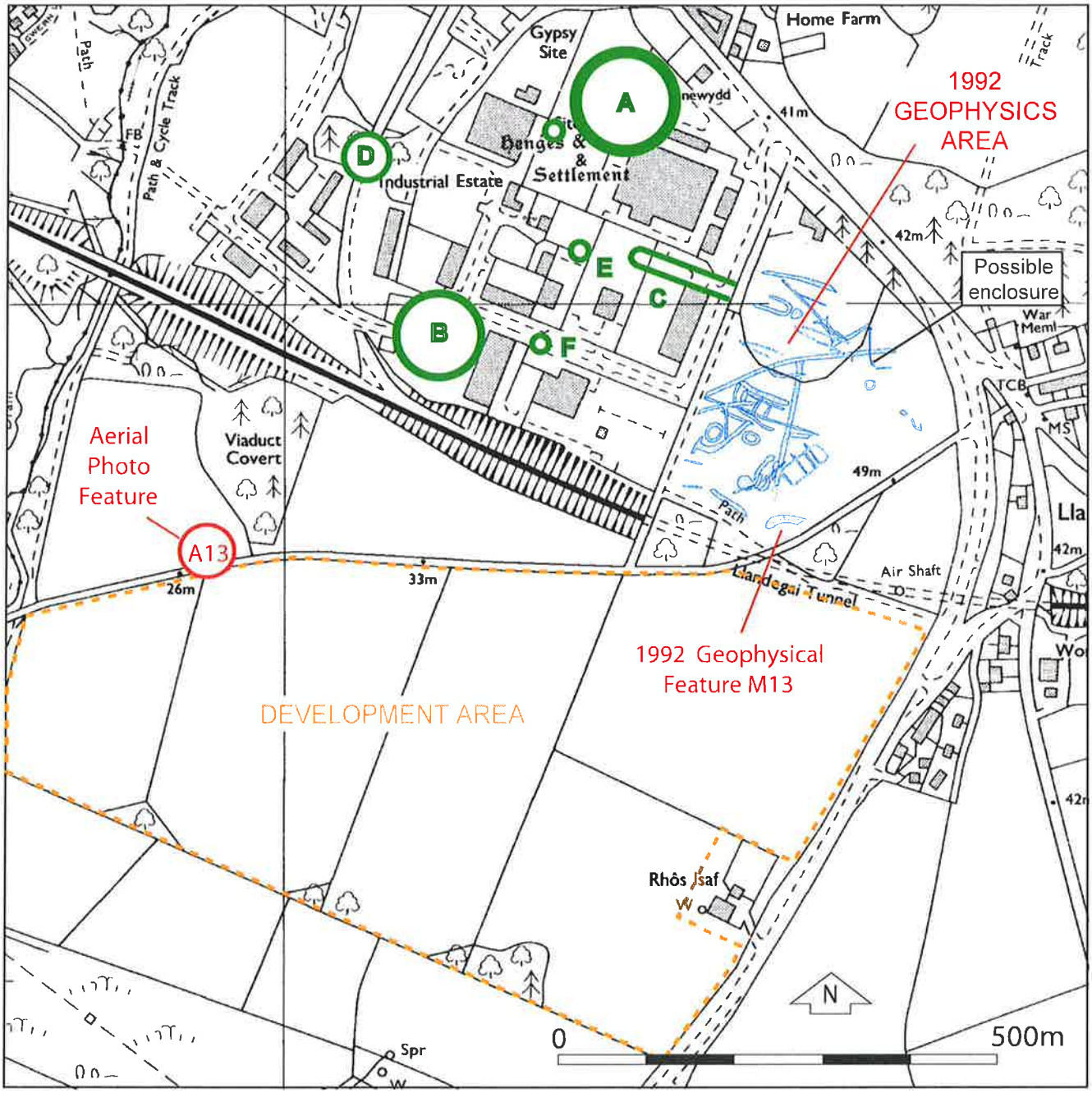
8.0 Further information

8.1 This document outlines best practice expected of an archaeological assessment but cannot fully anticipate the conditions that will be encountered as work progresses. If requirements of the brief cannot be met they should only be excluded or altered after gaining written approval of the Gwynedd Archaeological Planning Service.

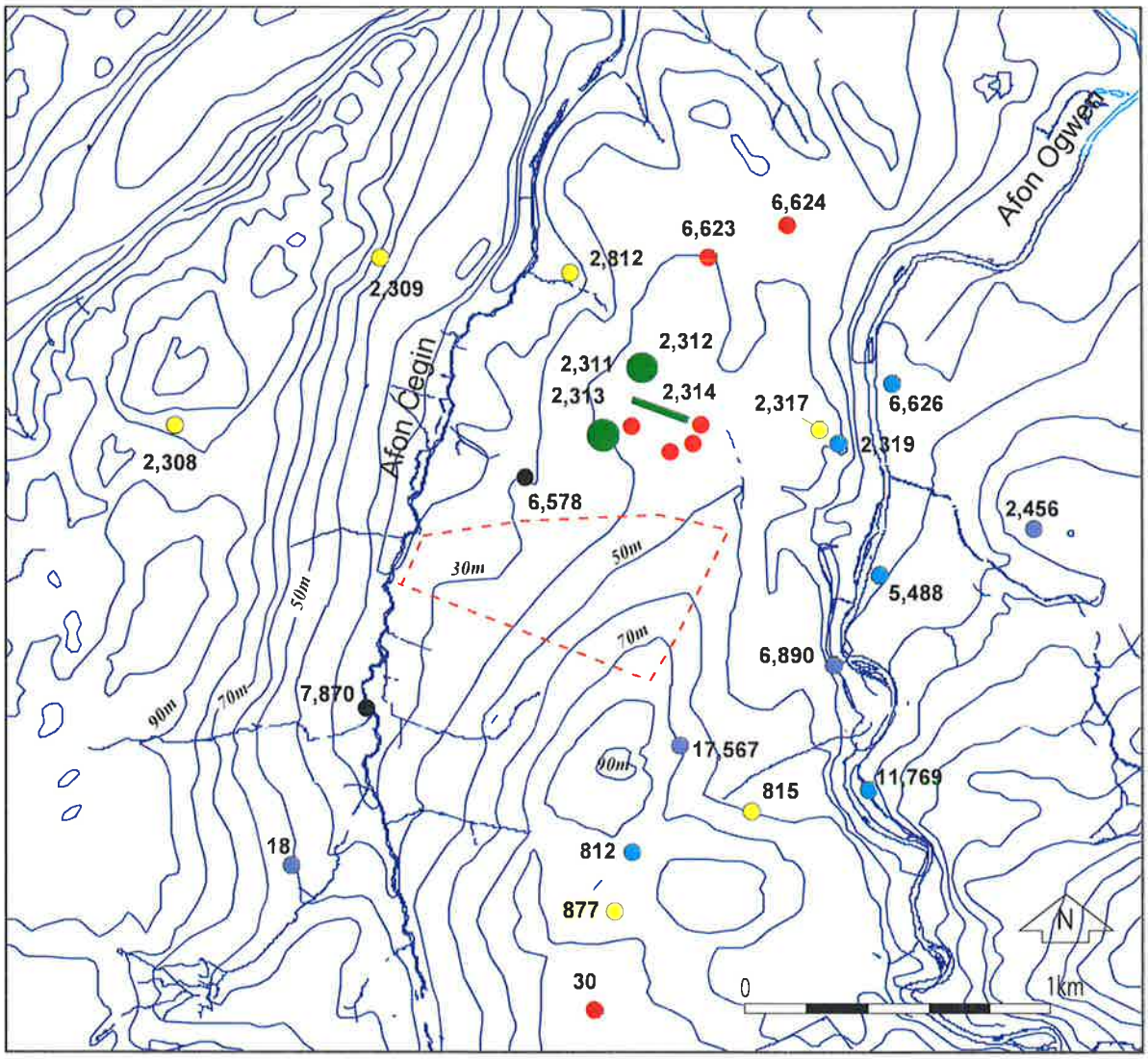
8.2 Further details or clarification of any aspects of the brief may be obtained from the Development Control Archaeologist at the address below.

Emily La Trobe-Bateman
Development Control Archaeologist

Gwynedd Archaeological Planning Service, Craig Beuno, Ffordd Y Garth, Bangor, Gwynedd L57 2RT
Ffon/Tel: 01248 370926 Ffacs/Fax: 01248 370925 emily@heneb.co.uk

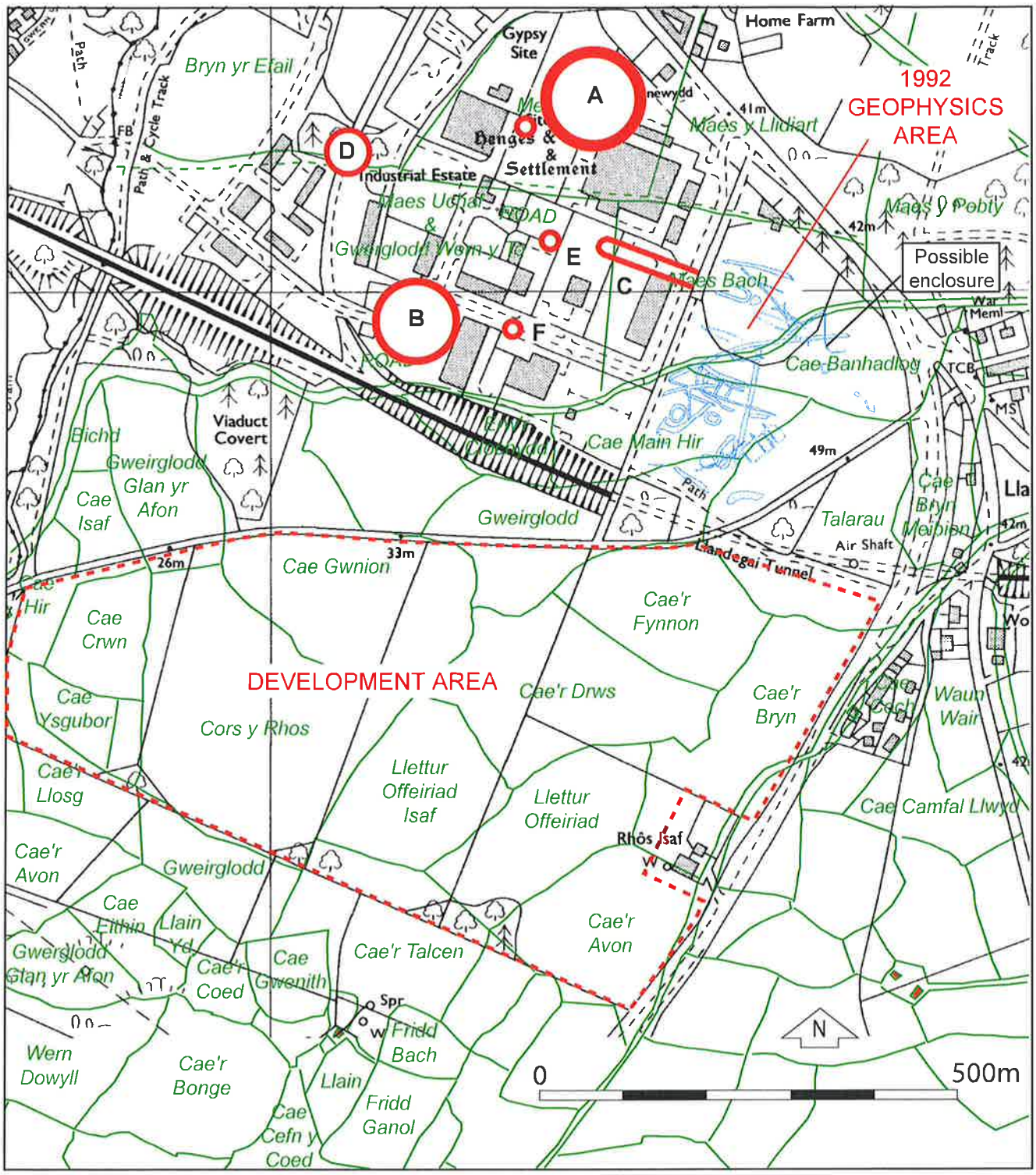


Parc Bryn Cegin Fig. 1 Location of the development area in relation to the Neolithic henge complex (Green) and the features identified by the 1992 magnetometry geophysical survey (Blue) and additional aerial photographic evidence

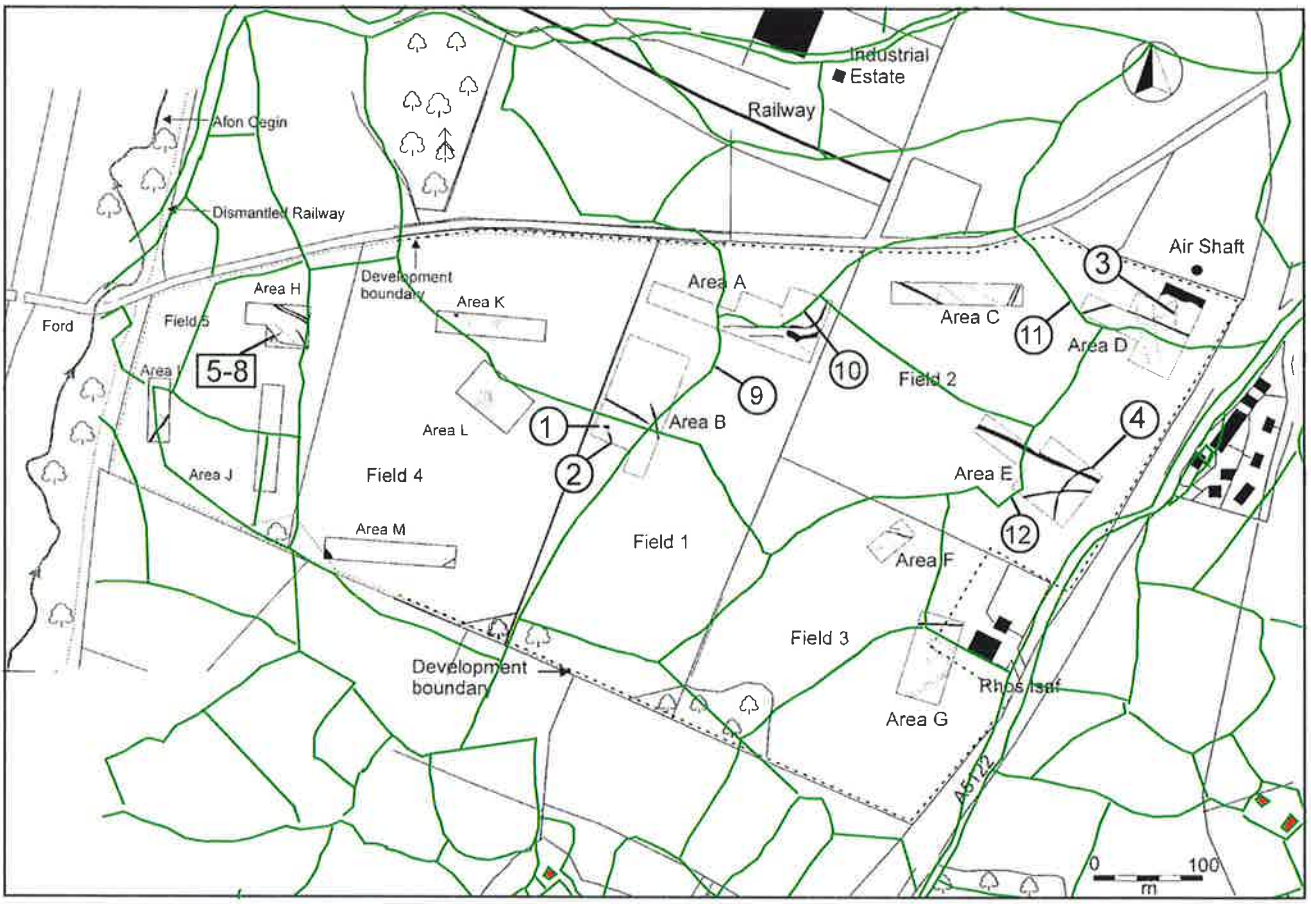


- Worked flint find
- Neolithic henge and cursus complex
- Early Bronze Age burial mound, or probable site of
- Development area
- Mid/Late Bronze Age site or find
- Roman site or find
- Medieval, Post-med or undated site

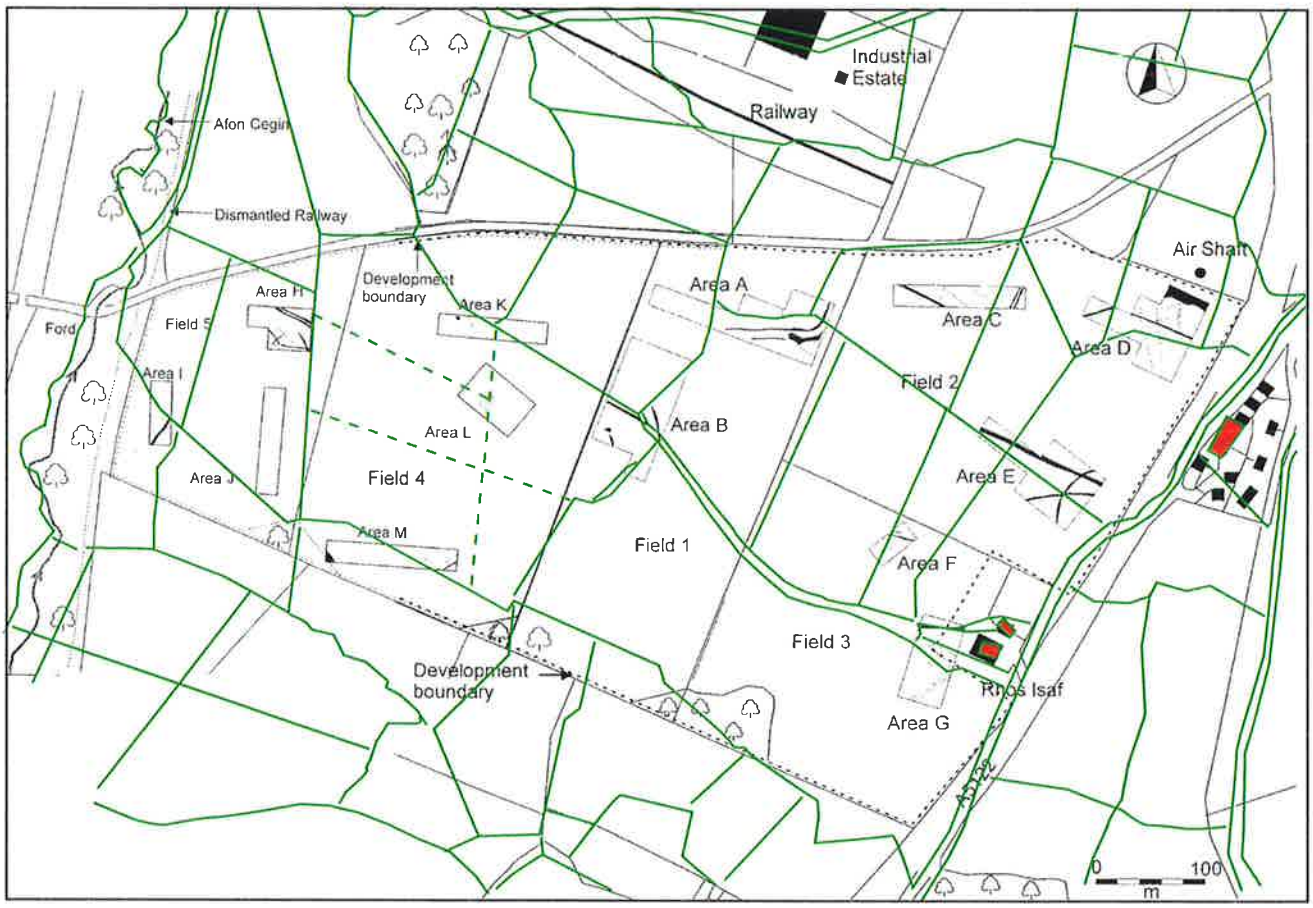
Parc Bryn Cegin Fig. 2 Location of the development area and of all archaeological sites and finds recorded in the Gwynedd Historic Environment Record within 1km in relation to topography



Parc Bryn Cegin Fig. 3 18th century field system (Green) and field names in relation to the modern field pattern (from Penrhyn Ms. S2205)



Parc Bryn Cegin Fig. 4 1999 geophysics results (Areas A to M) in relation to the 1768 field pattern (Green) (Penrhyn Ms. S2205), indicating possible archaeological features (1-8) and potentially significant boundary features (9-12)
Based on OS 1:10,000 scale maps. © Crown copyright. All rights reserved. Licence number AL 100020895.



Parc Bryn Cegin Fig. 5 1999 geophysics results (Areas A to M) in relation to 1841 field boundaries (Green) (Penrhyn Ms. S 2215)
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Parc Bryn Cegin Fig. 6 Stratascan Geophysical Survey 2005 - Abstraction and Interpretation of Magnetometer Anomalies - Areas 1 and 2 (Stratascan 2005, Fig. 14)

Amendments		
Issue No.	Date	Description
-	-	-

KEY

- Linear magnetic disturbance - pipeline/cable
- Positive linear anomaly - agricultural mark
- Positive linear anomaly - cut feature
- Negative linear anomaly - remains of ?earthwork/embankment
- Positive and negative linear anomalies - probable land drains
- Positive linear anomaly - uncertain origin
- Area of low magnitude negative response - uncertain origin
- Area of low magnitude positive response - uncertain origin
- Area of magnetic variation - possible geological/pedological response

Client

GWYNEDD ARCHAEOLOGICAL TRUST

Project Title — Job No. 1963

GEOPHYSICAL SURVEY - PARC BRYN CEGIN, LLANDEGAI

Subject

ABSTRACTION AND INTERPRETATION OF MAGNETOMETER ANOMALIES - AREAS 1 AND 2

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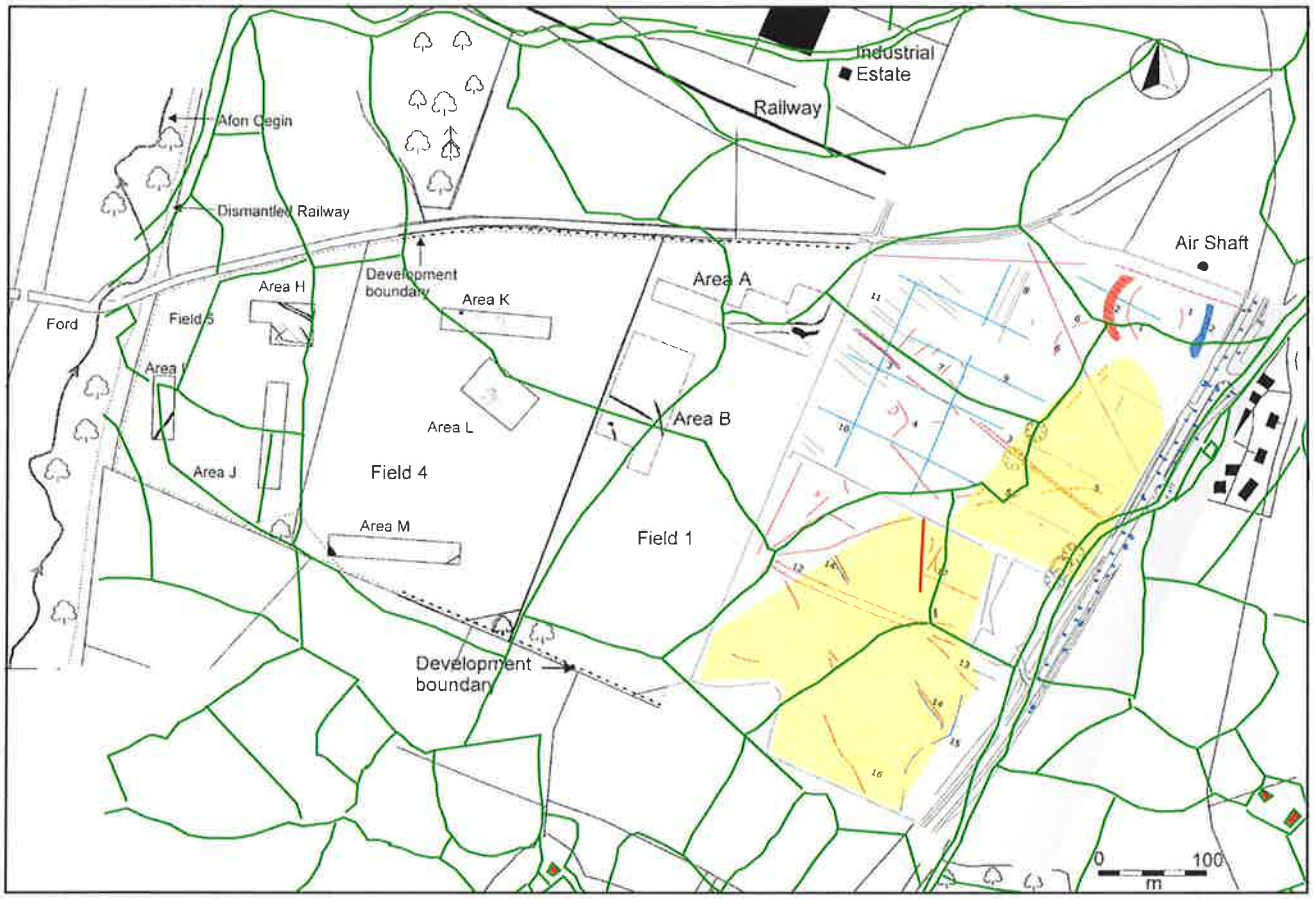
www.stratascan.co.uk

Scale 1:2500 (0m, 50, 100m)

Plot	Checked by	Issue No.
A3	KTD	01
Survey date	Drawn by	Figure No.
JAN 05	DJS	14



Parc Bryn Cegin Fig. 7 2005 geophysics results in relation to the 1768 field pattern (Green) (Penrhyn Ms. S2205)
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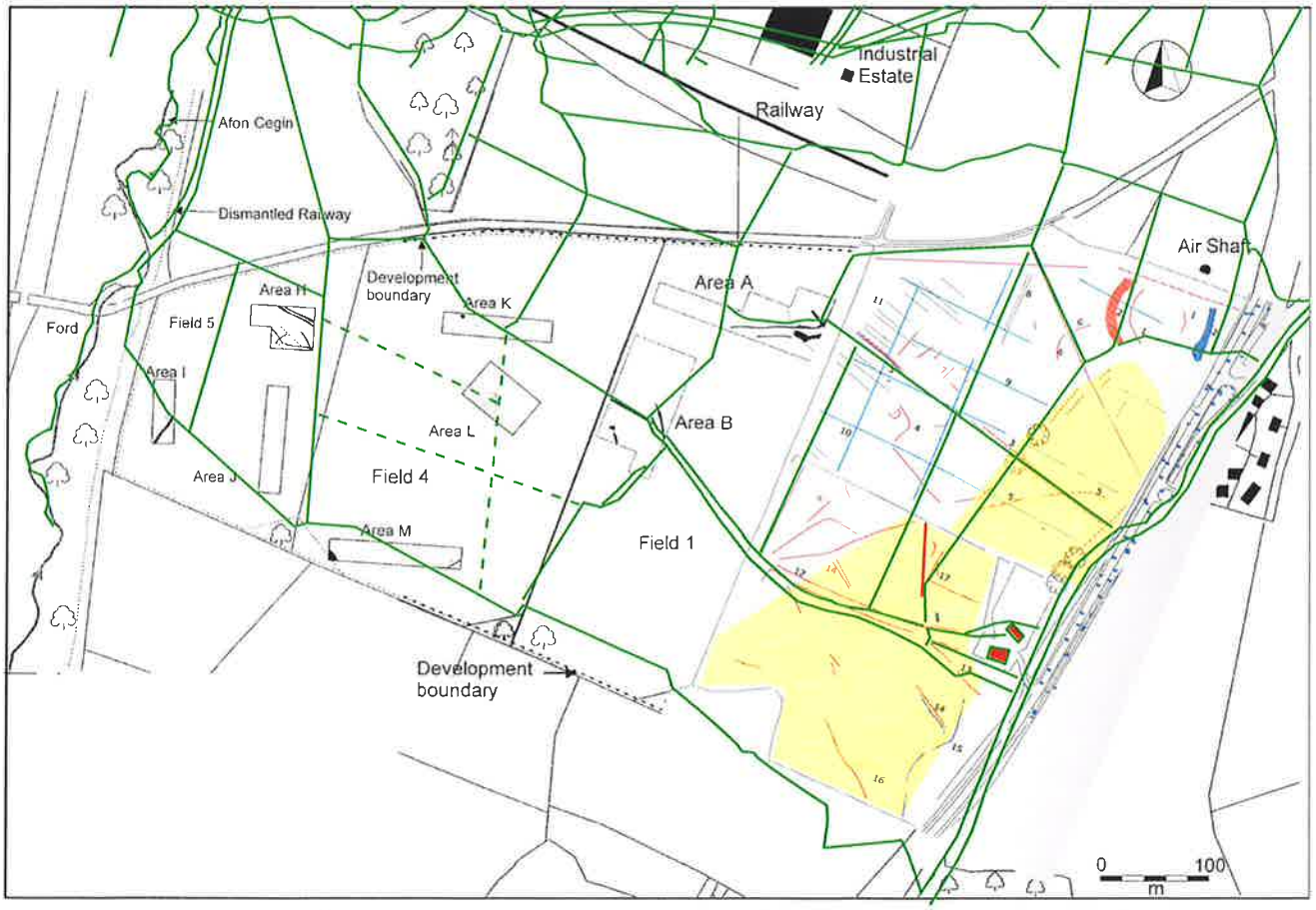

Parc Bryn Cegin Fig. 8 2005 geophysics results in relation to the 1841 field pattern (Green) (Penrhyn Ms. S2215)
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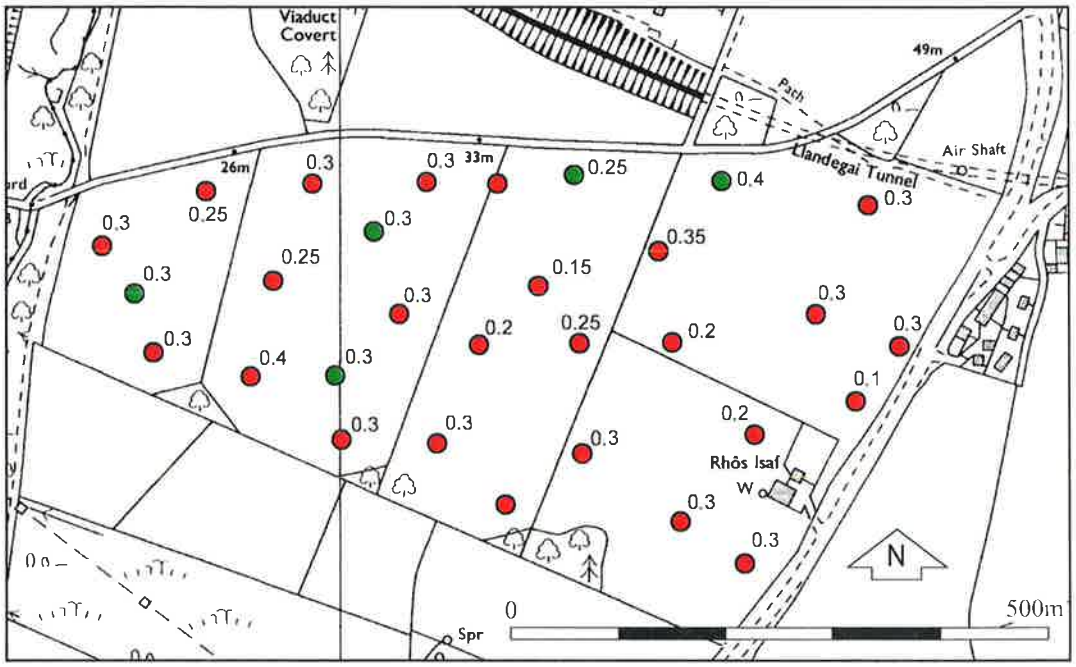

Fig. 9 Parc Bryn Cegin: Topsoil depths in boreholes (Green) and test pits (Red) recorded by *Geotechnics*
Based on OS 1:10,000 scale maps. © Crown copyright. All rights reserved. Licence number AL 100020895.

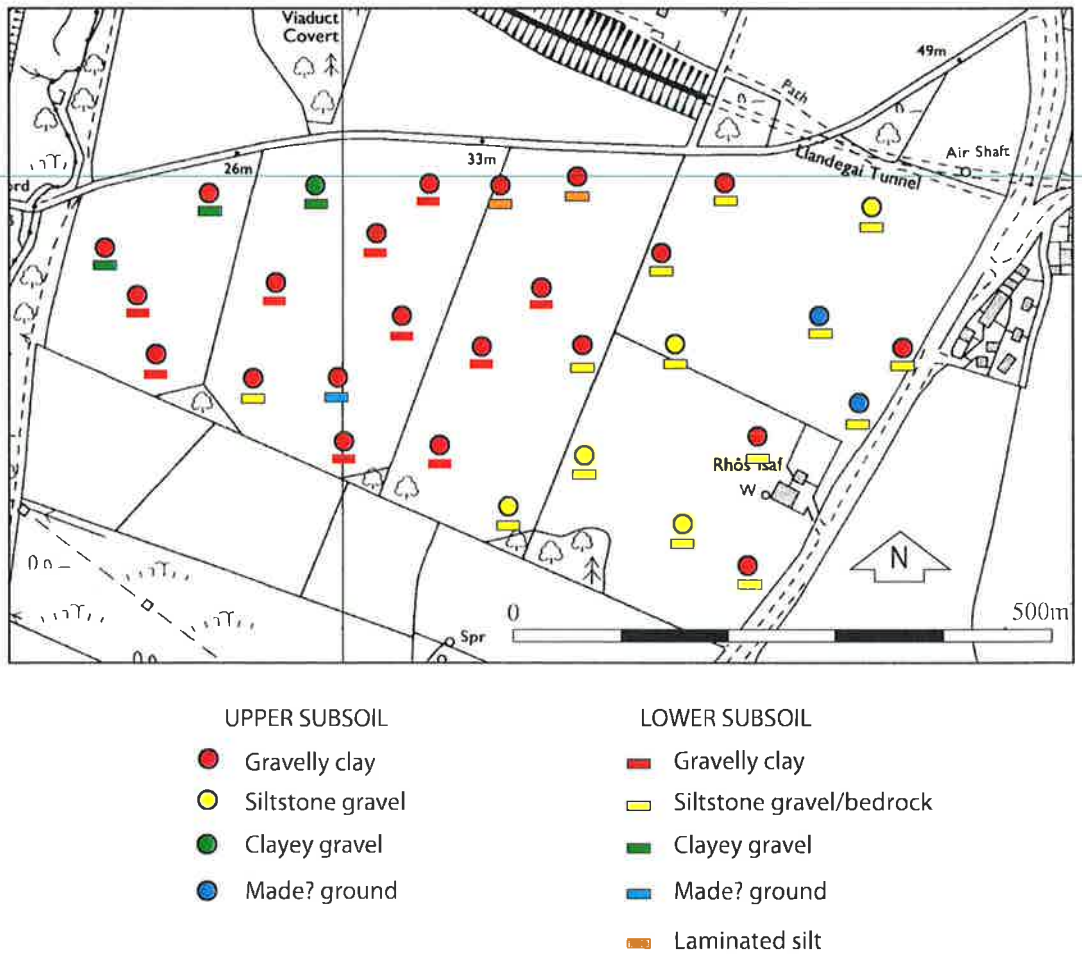

Fig. 10 Parc Bryn Cegin: Subsoil types recorded by *Geotechnics*
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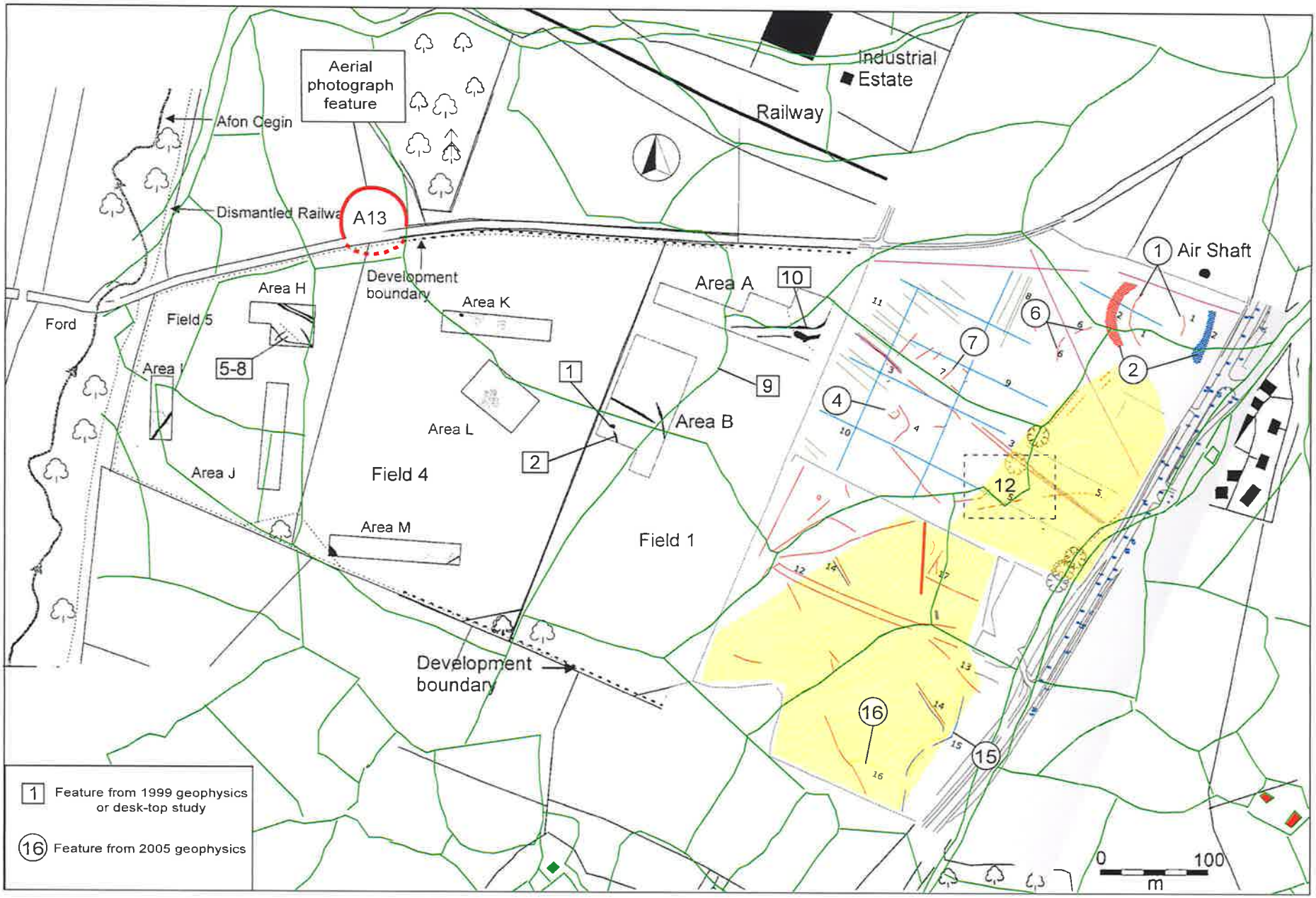

Parc Bryn Cegin Fig. 11 Summary of location of archaeological or historical features or areas requiring investigation.
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REGISTERED ORGANISATION IFA

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ARCHAEOLEGOL
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