1565

Tir oddi ar Ffordd Llandygai/ Land off Llandygai Road, Bangor, Gwynedd

ASESU A GWERTHUSO ARCHEOLEGOL / ARCHAEOLOGICAL ASSESSMENT AND EVALUATION

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

TIR ODDI AR FFORDD LLANDYGAI, BANGOR/ LAND OFF LLANDYGAI ROAD, BANGOR,

ASESU A GWERTHUSO ARCHEOLEGOL / ARCHAEOLOGICAL ASSESSMENT AND EVALUATION

Yr Amgylchedd Hanesyddol yn Cofnodi Prif Gyfeirnod /
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CRYNHODEB ANHECHNEGOL

Dirprwyodd Ymddiriedolaeth Archeolegol Gwynodd gab Macbryde Group Limited i ymgymryd asesiad ac arolwg (arolwg geoffisegol) archeolegol mewn blaenoriaeth o ddatblygiad preswyl awgrymedig ar dir yn Ffordd Llandygai, Bangor, Gwynedd. Roedd yr ardal yn adnabyddus i fod yn gae pori amgenach, ffinedig yn y ddwyran gan dramffordd creiriol a therfyn parc stad Penrhyn, gan ffordd A5 Telford yn y gorllewin, a choedwig aeddfed yn y gogledd. Mae'r cae ei hun yn nodedig i fod yn donnog mewn natur, gydag ardal ganolog uchel ac yn llethrog i'r gogledd a'r dde, gyda thystiolaeth o rychau yn bresennol. Roedd pymtheg nodwedd a phedwar ar hugain anomaledd geoffisegol yn donededig, y rhan fwyaf ohonynt yn ol-ganloesoedd mewn dyddiad, sydd yn dangos arwyddocâd o'r dirwedd yn gysylltiedig gyda thirwedd parc aristocrataidd, a nodweddion diwydiannol cynnar mewn perthynas gyda'r chwarelu llechi a llwybrau cludo. Rodd nodweddion posib o weithgaredd cynhanesyddol a canoloesoedd yn donededig yn ystod arolwg geoffisegol. Mae'r ardal ar yr un llwyfandir a Stad Ddiwydiannol Llandygai a Pharc Bryn Cegin, dau safle o brif archaeoleg cynhanesyddol a hwyrach. Mae topograffeg yr ardal, gyda'r archaeoleg arwyddocaol hysbys, yn golygu mae yna addodau cudd rhesymol i uchel o weddillion archeolegol dan gladd o'r canoloesoedd a gynharach yn yr ardal. Seiliedig ar ganlyniadau hon, mae cymeradwyaethau wedi ei neud i asesiad archeolegol ymhellach trwy brawf ffosydd.

NON-TECHNICAL SUMMARY

Gwynedd Archaeological Trust was commissioned by Macbryde Group Limited to undertake an archaeological assessment and evaluation (geophysical survey) in advance of a proposed residential development on land at Llandygai Road, Bangor, Gwynedd. The area was noted to be an improved pasture field, bounded to the east by a relict tramway and Penrhyn estate infrastructure and park boundary, the west by Telford's A5 road, and to the north by mature woodland. The field itself was noted to have an undulating nature, with a central raised area sloping to both north and south, with some evidence for ridges present. Fifteen features and twenty-four geophysical anomalies were identified, the majority of which were post-medieval in date, demonstrating the significance of the landscape as associated with an aristocratic landscape park, and early industrial features relating to slate quarrying and transport routes. Possible prehistoric or medieval activity was identified during the geophysical survey and the area is on the same plateau as the Llandygai Industrial estate and Parc Bryn Cegin, two major sites of prehistoric and later archaeology. The topography of the area, along with the very significant known archaeology in the vicinity, means that there is a moderate to high potential for the presence of buried medieval and earlier archaeological remains on the site. Based on these results, recommendations have been made for further archaeological evaluation through trial trenching.

1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) was commissioned by Macbryde Group Limited to undertake an archaeological assessment and evaluation (geophysical survey) in advance of a proposed residential development on land at Llandygai Road, Bangor, Gwynedd, LL57 4HP (NGR: SH5928171847; Figure 01; Figure 02). The proposed development area measures 2.51 ha and is located within a field of improved pasture on the eastern side of Llandygai Road. The assessment and evaluation have been undertaken as part of a planning application for 67no two-storey dwellings with associated access and car parking. The development site has been allocated for housing within the Gwynedd and Isle of Anglesey County Council Joint Local Development Plan adopted in 2017 (reference T5).

The assessment and evaluation was undertaken in September 2020 in accordance with the following guidelines:

- *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* Version 1.1 (The Welsh Archaeological Trusts, 2018);
- *Guidelines for digital archives* (Royal Commission on Ancient and Historic Monuments of Wales, 2015);
- *Management of Archaeological Projects* (English Heritage, 1991);
- *Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide* (Historic England, 2015);
- *Standard and Guidance for Archaeological Geophysical Survey* (Chartered Institute for Archaeologists, 2014); and
- *Standard and Guidance for Historic Environment Desk-Based Assessment* (Chartered Institute for Archaeologists, 2017).

The archaeological assessment and evaluation was monitored by the Gwynedd Archaeological Planning Service and was undertaken in accordance with an approved Written Scheme of Investigation (Appendix I). In line with the Gwynedd Historic Environment Record (HER) requirements, the HER was contacted at the onset of the project to ensure that any data arising was formatted in a manner suitable for accession to the HER under the guidance set out in *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* (The Welsh Archaeological Trusts, 2018). The HER was informed of the

project start date, location, grid reference and estimated timescale; the project was assigned HER Enquiry Number GATHER1311 and the Event PRN 45966. A bilingual event summary has been prepared for submission to the HER in accordance with their guidance.

Gwynedd Archaeological Trust is certified to ISO 9001:2015 and ISO 14001:2015 (Cert. No. 74180/B/0001/UK/En) and is a Registered Organisation with the Chartered Institute for Archaeologists and a member of the Federation of Archaeological Managers and Employers (FAME).

2 METHODOLOGY

A desk-based assessment is defined as “a programme of study of the historic environment within a specified area or site on land, the inter-tidal zone or underwater that addresses agreed research and/or conservation objectives. It consists of an analysis of existing written, graphic, photographic and electronic information in order to identify the likely heritage assets, their interests and significance and the character of the study area, including appropriate consideration of the settings of heritage….Significance is to be judged in a local, regional, national or international context as appropriate” (CIfA 2014, 4).

The desk-based assessment involved a study of the following resources:

1. The regional Historic Environment Register ((HER) Gwynedd Archaeological Trust, Craig Beuno, Ffordd y Garth, Bangor, Gwynedd LL57 2RT) were examined for information concerning the study area, defined as the highlighted plot in Figure 01 and the immediate environs. This included an examination of the core HER, the 1:2500 County Series Ordnance Survey maps and any secondary information held within the HER. All identified features were mapped, described and added to a gazetteer of sites and the relative importance of any sites defined;
2. The National Monuments Record of Wales (Royal Commission on the Ancient and Historical Monuments of Wales, Plas Crug, Aberystwyth SY23 1NJ) was checked for sites additional to the HER;
3. Aerial photographs from the National Monuments Record of Wales (Royal Commission on the Ancient and Historical Monuments of Wales, National Monuments Record of Wales, Plas Crug, Aberystwyth SY23 1NJ) was examined for potential features;
4. An online catalogue search of the National Library of Wales (Penglais Rd, Aberystwyth SY23 3BU) was completed;
5. Archive data, including primary and secondary sources, historic maps and estate maps will be examined at the regional archives (Caernarfon Record Office, Gwynedd Archive Service, Gwynedd Council, Caernarfon, LL55 1SH). The examination of the archive data included the local tithe map and schedule. Access to the Caernarfon Record Office archives was restricted due to Covid-19 regulations and the Penrhyn Estate archives held at the Bangor University Archives and Special Collections department could not be accessed as the Archives and Special Collections were closed until further notice due to Covid-19 restrictions; and

6. Light Detection and Ranging (LiDAR) data will be examined from the Lle Geo-Portal at http://lle.gov.wales/home for information on potential surface features using digital terrain modelling and digital surface modelling;

2.1 Walkover Survey

A walkover survey was undertaken within the assessment area and descriptive information completed on GAT pro-formas. Any features identified were recorded and then added to the overall gazetteer, with their relative importance defined. A photographic record was maintained using GAT pro-formas and images were taken in RAW format using a digital SLR set to maximum resolution (Nikon D3000; resolution: 3,872 × 2,592 [10.2 effective megapixels]). Photographic images were archived in TIFF format using archive numbering system G2663_001 to G2663_034 (Appendix IV).

2.2 Geophysical survey

2.2.1 Introduction

The geophysical survey was undertaken by GAT between the 14th and 16th September 2020. The key aim and objective of the geophysical survey was to establish the extent to which potential archaeological remains survive at the location of the proposed development. The survey was carried out in a series of traverses within a series of 20x20m grids covering the footprint of the evaluation area. The grids were tied into the Ordnance Survey National Grid using a Trimble R8S high precision GPS system. The survey was conducted using a Barrington Grad 601-2 dual fluxgate gradiometer and carried out at standard resolution with a 1.0m traverse interval and 0.25m sample interval.

2.2.2 Instrumentation

The Bartington Grad 601-2 dual fluxgate gradiometer uses a pair of Grad-01-100 sensors. These are high stability fluxgate gradient sensors with a 1.0m separation between the sensing elements, giving a strong response to deeper anomalies. The instrument detects variations in the earth's magnetic field caused by the presence of iron in the soil. This is usually in the form of weakly magnetized iron oxides which tend to be concentrated in the topsoil. Features cut into the subsoil and backfilled or silted with topsoil, therefore contain greater amounts of iron and can therefore be detected with the gradiometer. This is a simplified description as there are other processes and materials which can produce detectable anomalies. The most obvious is the presence of pieces of iron in the soil or immediate environs which usually produce very high readings and can mask the relatively weak readings produced by variations in the soil. Strong readings are also produced by archaeological features such as hearths or kilns as fired clay acquires a permanent thermo-remnant magnetic field upon cooling. This material can also get spread into the soil leading to a more generalized magnetic enhancement around settlement sites. Not all surveys can produce good results as results can be masked by large magnetic variations in the bedrock or soil or high levels of natural background "noise" (interference consisting of random signals produced by material with in the soil). In some cases, there may be little variation between the topsoil and subsoil resulting in undetectable features. The Bartington Grad 601 is a hand held instrument and readings can be taken automatically as the operator walks at a constant speed along a series of fixed length traverses. The sensor consists of two vertically aligned fluxgates set 500mm apart. Their cores are driven in and out of magnetic saturation by a 1,000Hz alternating current passing through two opposing driver coils. As the cores come out

of saturation, the external magnetic field can enter them producing an electrical pulse proportional to the field strength in a sensor coil. The high frequency of the detection cycle produces what is in effect a continuous output. The gradiometer can detect anomalies down to a depth of approximately one meter. The magnetic variations are measured in nanoTeslas (nT). The earth's magnetic field strength is about 48,000 nT; typical archaeological features produce readings of below 15nT although burnt features and iron objects can result in changes of several hundred nT. The machine is capable of detecting changes as low as 0.1nT.

2.2.3 Data Collection

The gradiometer includes an on-board data-logger. Readings are taken along parallel traverses of one axis of a 20m x 20m grid. The traverse interval is 1.0m and readings are logged at intervals of 0.25m along each traverse. Marked guide ropes are used to ensure high positional accuracy during the high resolution survey. The data is transferred from the data-logger to a computer where it is compiled and processed using ArchaeoSurveyor2 software. The data is presented as a grey scale plot where data values are represented by modulation of the intensity of a grey scale within a rectangular area corresponding to the data collection point within the grid. This produces a plan view of the survey and allows subtle changes in the data to be displayed. This is supplemented by an interpretation diagram showing the main feature of the survey with reference numbers linking the anomalies to descriptions in the written report. It should be noted that the interpretation is based on the examination of the shape, scale and intensity of the anomaly and comparison to features found in previous surveys and excavations etc. In some cases the shape of an anomaly is sufficient to allow a definite interpretation e.g. a Roman fort. In other cases all that can be provided is the most likely interpretation. The survey will often detect several overlying phases of archaeological remains and it is not usually possible to distinguish between them. Weak and poorly defined anomalies are most susceptible to misinterpretation due to the propensity of the human brain to define shapes and patterns in random background "noise".

2.2.4 Data Processing

The data collected in each 20m x 20m grid is transferred from the data-logger to a personal computer where it is compiled and processed using TerraSurveyor v.3.0.33.10 software. Additional analysis of the data is carried out using MagPick v3.25.

The numeric data are converted to a greyscale plot where data values are represented by modulation of the intensity of a greyscale within a rectangular area corresponding to the data collection point within the grid. This produces a plan view of the survey and allows subtle changes in the data to be displayed. X-Y trace plots of the collected data are also used to aid interpretation.

The Bartington Grad 601-2 captures raw data in the range of +/- 3000 nT. When raw data is presented in greyscale format all but the extreme high or low readings are rendered in the central range of the greyscale and therefore not visible against the background. The data is minimally processed by clipping as archaeological features tend to produce readings within the +/-15nt range.

Corrections may also be made to the data to compensate for instrument drift and other data collection inconsistencies. These corrections may include:

- de-striping using zero mean traverse which sets the background mean of each traverse within each grid to zero, removing striping effects and edge discontinuities;
- de-staggering in order to correct for slight differences in the speed of walking on forward and reverse traverses;
- de-spiking to remove high or low readings caused by stray pieces of iron, fences, etc. in order to reduce background magnetic noise;
- the application of a high pass filter to remove low frequency, large scale spatial detail for example a slowly changing geological background;
- the application of a low pass filter to remove high frequency, small scale spatial detail in order to smooth data or to enhance larger weak anomalies; and
- interpolation to produce a smoothed grayscale plot with more but smaller pixels in order to aid clarity.

2.2.5 Presentation of results and interpretation

The results of the survey are presented as a minimally processed greyscale plot (raw data clipped to +/- 15nT) and a processed greyscale plot if further processing or enhancement has been performed. X-Y trace plots of the collected data may also be included if they are necessary to support the interpretation of specific anomalies visible on the greyscale plots.
Magnetic anomalies are identified, interpreted and plotted onto an interpretative plot with reference numbers linking the anomalies to descriptions within the written report. When interpreting the results, several factors are taken into consideration, including the shape, scale and intensity of the anomaly and the local conditions at the site (geology, pedology, topography, etc.). Anomalies are categorised by their potential origin. Where responses can be related to other existing evidence, the anomalies will be given specific categories, such as Abbey Wall or Roman Road. Where the interpretation is based largely on the geophysical data, levels of confidence are implied, for example: Probable, or Possible Archaeology. The former is used for a confident interpretation, based on anomaly definition and/or other corroborative data such as cropmarks. Poor anomaly definition, a lack of clear patterns to the responses and an absence of other supporting data reduces confidence, hence the classification *Possible.*

2.2.6 Interpretation categories

In certain circumstances (usually when there is corroborative evidence from desk-based or excavation data) very specific interpretations can be assigned to magnetic anomalies (for example, Roman Fort, Wall, etc.) and where appropriate, such interpretations will be applied. The list below outlines the generic categories commonly used in the interpretation of the results.

Interpretation Category	**Description**
Archaeology / Probable Archaeology	*This term is used when the form, nature and pattern of* the responses are clearly or very probably archaeological and/or if corroborative evidence is available. These anomalies, whilst considered anthropogenic, could be of any age.
Possible Archaeology	These anomalies exhibit either weak signal strength and/or poor definition, or form incomplete archaeological patterns, thereby reducing the level of confidence in the interpretation. Although the archaeological interpretation is favoured, they may be the result of variable soil depth, plough damage or even aliasing as a result of data collection orientation.
Industrial / Burnt-Fired	Strong magnetic anomalies that, due to their shape and form or the context in which they are found, suggest the presence of kilns, ovens, corn dryers, metalworking areas or hearths. It should be noted that in many instances modern ferrous material can produce similar magnetic anomalies.
Former Field Boundary (probable and possible)	Anomalies that correspond to former boundaries indicated on historic mapping, or which are clearly a continuation of existing land divisions. *Possible* denotes less confidence where the anomaly may not be shown on historic mapping but nevertheless the anomaly displays all the characteristics of a field boundary.
Ridge and Furrow	Parallel linear anomalies whose broad spacing suggests ridge and furrow cultivation. In some cases, the response may be the result of more recent agricultural activity
Agriculture (ploughing)	Parallel linear anomalies or trends with a narrower spacing, sometimes aligned with existing boundaries, indicating more recent cultivation regimes.

Interpretation Category	Description
Land Drain	Weakly magnetic linear anomalies, quite often appearing in series forming parallel and herringbone patterns. Smaller drains may lead and empty into larger diameter pipes, which in turn usually lead to local streams and ponds. These are indicative of clay fired land drains.
Natural	These responses form clear patterns in geographical zones where natural variations are known to produce significant magnetic distortions.
Magnetic Disturbance	Broad zones of strong dipolar anomalies, commonly found in places where modern ferrous or fired materials (e.g. brick rubble) are present.
Service	Magnetically strong anomalies, usually forming linear features are indicative of ferrous pipes/cables. Sometimes other materials (e.g. PVC) or the fill of the trench can cause weaker magnetic responses which can be identified from their uniform linearity.
Ferrous	This type of response is associated with ferrous material and may result from small items in the topsoil, larger buried objects such as pipes, or above-ground features such as fence lines or pylons. Ferrous responses are usually regarded as modern. Individual burnt stones, fired bricks or igneous rocks can produce responses similar to ferrous material.
Uncertain Origin	Anomalies which stand out from the background magnetic variation, yet whose form and lack of patterning give little clue as to their origin. Often the characteristics and distribution of the responses straddle the categories of *Possible Archaeology / Natural* or (in the case of linear responses) *Possible Archaeology / Agriculture*; occasionally they are simply of an unusual form.

Where appropriate some anomalies are further classified according to their form (positive or negative) and relative strength and coherence (trend: low and poorly defined).

2.3 Gazetteer

A gazetteer has been compiled for all existing and newly identified sites within the local area, based on information sourced from the desk based assessment and geophysical survey; the gazetteer (para. 3.4) has been prepared in the following format:

Feature Number	
Site name	
PRN number	
Grid reference	
Period	
Site type	
Assessment category	
Description	
Impact	
Recommendation for further assessment/evaluation	
Recommendation for mitigatory measures	

The following categories have been used to define the assessment category of the archaeological asset:

Category A - Sites of National Importance.

Scheduled Monuments, Listed Buildings of grade II* and above, as well as those that would meet the requirements for scheduling (ancient monuments) or listing (buildings) or both. Sites that are scheduled or listed have legal protection, and it is recommended that all Category A sites remain preserved and protected *in situ*.

Category B - Sites of regional or county importance.

Grade II listed buildings and sites which would not fulfil the criteria for scheduling or listing, but which are nevertheless of particular importance within the region. Preservation *in situ* is the preferred option for Category B sites, but if damage or destruction cannot be avoided, appropriate detailed recording might be an acceptable alternative.

Category C - Sites of district or local importance.

Sites which are not of sufficient importance to justify a recommendation for preservation if threatened. Category C sites nevertheless merit adequate recording in advance of damage or destruction.

Category D - Minor and damaged sites.

Sites that are of minor importance or are so badly damaged that too little remains to justify their inclusion in a higher category. For Category D sites, rapid recording, either in advance of or during destruction, should be sufficient.

Category E - Sites needing further investigation.

Sites, the importance of which is as yet undetermined and which will require further work before they can be allocated to categories A - D are temporarily placed in this category, with specific recommendations for further evaluation.

The impact of the proposed works on any asset has been identified using the following impact criteria:

None:

There is no construction impact on this asset.

Slight:

This has generally been used where the impact is marginal and would not by the nature of the site cause irreversible damage to the remainder of the asset, *e.g.* part of a trackway or field bank.

Unlikely:

This category indicates sites that fall within the band of interest but are unlikely to be directly affected. This includes sites such as standing and occupied buildings at the margins of the band of interest.

Likely:

Sites towards the edges of the study area, which may not be directly affected, but are likely to be damaged in some way by the construction activity.

Significant:

The partial removal of an asset affecting its overall integrity. Assets falling into this category may be linear features such as roads or tramways where the removal of part of the feature could make overall interpretation problematic.

Considerable:

The total removal of an asset or its partial removal which would effectively destroy the remainder of the site.

Unknown:

This is used when the location of the asset is unknown, but thought to be in the vicinity of the proposed works.

2.4 Archive and Dissemination

A full archive including plans, photographs, written material and any other material resulting from the project has been prepared and the following dissemination has been applied:

- A digital report has been prepared for *Macbryde Group Ltd* and Gwynedd Archaeological Planning Service;

- A paper report plus a digital report has been prepared for the regional Historic Environment Record, Gwynedd Archaeological Trust along with relevant digital datasets, including a bilingual event summary, in accordance with *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* (Version 1); and

- A digital report and archive data has been prepared for submission to the *Royal Commission on the Ancient and Historical Monuments of Wales*, in accordance with the *RCAHMW Guidelines for Digital Archives Version 1*. Digital information will include the photographic archive and associated metadata.

3 RESULTS

3.1 Desk Based Assessment

3.1.1 Location and Geological Summary

The study area is located approximately 1 km east of the city of Bangor, It is bounded on the west by the A55 and to the north by the road leading to Port Penrhyn and the Penrhyn Castle demesne. The trapezoidal shaped site is located within the parish of Llandygai and lies at approximately 10m OD, sloping slightly westwards towards the Afon Cegin, which is close by to the west.

The underlying geology is that of a band Ordovician rocks which are ‘contiguous with the complex syncline of Snowdonia’ flanked by outcrops of Cambrian rocks to the north and south (Bassett & Davies, 1977). The field at the west of the study area has not been used as grazing pasture in recent years, and as a result vegetation obscures the area.

The rocks on either side of the valley in which Bangor is situated belong principally to the Arvonian period of the Lower Cambrian, and form part of the Bangor Ridge, which runs from Bangor to Caernarfon. The valley was probably formed by volcanic faulting during the Caledonian Orogeny, and its shape accentuated during glaciation. Carboniferous limestone lies north of the Bangor ridge, alongside the Menai Strait (Smith and George 1961; Challinor and Bates 1973; Howells, Reedman and Leveridge 1985).

The primary feature of the topography is, therefore, the location of the city within the confines of a narrow valley. Access into and out of the valley could only be achieved at certain places, and the development of road and rail communication have been important elements within the development of Bangor. This is not least because Bangor lay on, or close to, the principal route from London to Dublin through Holyhead. The ferries across the Menai Strait were a significant economic resource for the Church until the construction of Telford’s suspension bridge in 1825, and the construction of road and rail links through the city have been significant factors within its development.

3.1.2 Statutory and Non-Statutory Designations

The following assets have been identified in the immediate vicinity of the site (Figure 01):

- Grade II Listed Building Incline Cottage (LB 4085; GAT HER PRN 24862) adjacent to the proposed development site;
- The route of the Penrhyn Slate Quarry Railroad (GAT HER PRN 59451), which runs adjacent to the site forms part of the nominated *Penrhyn Slate Quarry Railroad and Penrhyn Slate Quarry Railway* (1.3) Element of Component Part 1 of the nominated *Slate Landscape of Northwest Wales* World Heritage Site; and
- The route of the Penrhyn Slate Quarry Railway (GAT HER PRN 59452) that runs adjacent to the site forms part of *The Penrhyn Slate Quarry Railroad and Penrhyn Slate Quarry Railway* (1.3) Element of Component Part 1 of the nominated *Slate Landscape of Northwest Wales* World Heritage Site.

Twenty-one sites are recorded on the Gwynedd HER within 500m of the centre of the study area. Of these one is prehistoric and the remaining twenty are post-medieval or later. They are listed in Appendix II and are shown on Figure 01.

The development site is within the Essential Setting of the Grade II* *Penrhyn Castle Registered Historic Park and Garden* (PGW (Gd) 40 (GWY)) and the *Dyffryn Ogwen Registered Landscape of Outstanding Historic Interest* (HLW (Gw) 10).

The Dyffryn Ogwen Landscape is described as '*the classic glaciated valley in north Snowdonia, containing contrasting evidence of prehistoric and later land use, superimposed by the extensive and visually dramatic remains of the recent and continuing industrial exploitation of slate. The area includes: Neolithic and Bronze Age funerary and ritual monuments; Iron Age hillforts and concentrations of relict settlements and field systems; medieval settlements; large and extensive remains of 19th and 20th centuries slate quarries, tips, attendant settlements and transport systems; Penrhyn Castle and Park; Telford's Holyhead Road; historic literary and social associations*' (Cadw/ICOMOS 1998b, 108). The study area lies close to evidence both of the prehistoric funerary and ritual monuments and the post-medieval, industrial and Penrhyn Park elements of this.

The Registered Historic Park and Garden is described as retaining '*much of its nineteenth-century character and the gardens, which have an exceptional collection of woody plants, are well preserved. The setting, and relationship of the house with the park and landscape, is*

outstanding. The structure and layout of the kitchen gardens, although they are disused, is interesting and remains in reasonable condition' (Cadw/ICOMOS 1998a). The study area lies within the essential setting of the landscape park, but just outside the park itself.

3.1.3 Environmental Remains and Soil Morphology

The lower lying land at the east of the study area is boggy and has some potential for the survival of palaeoenvironmental remains. Otherwise the potential for the survival of significant remains, other than any encountered in a secure archaeological deposit, is considered to be low. However, significant palaeoenvironmental evidence has been recovered from nearby archaeological sites.

3.1.4 Historical and Archaeological Background

3.1.4.1 Introduction

South and east of the city of Bangor lies an area of fertile land between the rivers Ogwen and Cegin, which forms a small peninsula jutting into Beaumaris Bay at the east end of the Strait. It was on this peninsula that the medieval estate of Penrhyn was established. The owners of the estate played a significant role in the development of Bangor, though it was the establishment of the slate quarries in the late 18th and 19th centuries that led to a greater transformation of the landscape, and the industrial and economic development of the area. Whilst the coastal location of Bangor would always have ensured the existence of a maritime quarter, it was the development of Port Penrhyn at the mouth of the River Cegin for slate trade that ensured a more vibrant industrial and maritime quarter than would otherwise have existed.

3.1.4.2 Prehistoric and Roman Settlement

Within Bangor itself, despite the lack of evidence, however, finds from within the valley, particularly of Bronze Age date, imply it may have been more settled than the evidence suggests. Within a garden along Upper Garth Road was found an Early Bronze Age collared urn (PRN 1973). Whilst very little survived, it may well have once been covered by a round barrow or cairn, and perhaps accompanied by other burial urns. From a later period, significant evidence comes from three finds of bronze palstaves, one of them accompanied by two palstave moulds. This last find (PRN 2304) occurred about 1800 in 'Damesfield, near Bangor, about a quarter of a mile from the Anglesey ferry' (*Arch Camb* 1856, 127-30). This was identified as 'Deansfield, Glanadda' by the Royal Commission, though it lies a mile and half from the ferry site (RCAHMW 1960, liii, No. 86 and fig 14). The moulds, one for unlooped palstaves and one for looped, date from the Middle Bronze Age, between approximately 1300 and 1400 BC. The accompanying axe was not the product of either of the moulds, but is a 'looped trident pattern palstave' (Lynch 1992, 124). Two other palstaves have been found north of Bangor ridge at Maesgeirchen. One was found in 1946 during the construction of the housing estate, and is of a similar date to the moulds from Deansfield (PRN 2309, Griffiths 1947). The other was found in 1990 during metal detecting, and dates from the Late Bronze Age (*c.* 800 BC). The axehead of this palstave is smaller, with a narrow thick blade, and deep stop ridges (PRN 2812; Lynch 1992).

Stone finds of probable prehistoric date include four stone mauls, or hammers. One of these was found in 1927 on land between the High Street and Bangor Mountain (PRN 2315; Hughes 1930). A group of 3 stone hammers (PRN 2308) were exhibited at a Bangor meeting of the Cambrians in 1860 by Captain Jones, who had founded a private museum in Bangor (Arch Camb 1860, 376-7). One of these may be identified with an example in Bangor museum (PRN 2307; Lynch 1986, 64, No. 214; RCAHMW 1960, xlv No. 27 and fig 11.5). More tentatively another of the three has been linked with one from Fodol, Pentir (RCAHMW xlvi No. 40 and fig 11.4; Lynch 1985, 64, No. 213). Though stone mauls have been occasionally associated with Bronze Age mining or metal working, their exact function and date are uncertain (Lynch 1986, 64; Pickin 1988; Briggs 2005).

A perforated round stone, from Bryn Adda, has been interpreted as a possible hanging weight, perhaps for use with a loom, and probably of Romano-British date. The find might imply the presence of late prehistoric or Romano-British settlement within the vicinity (PRN 1541; Kelly 1978). The only other indication of Roman settlement within the valley are the remains of a grinding stone, quern stone and spindle whorl found on the possible site of St

Mary's church by Harold Hughes, however, it is not possible to establish a firm date for these, nor is their context fully known (Hughes 1925).

The proposed development is located c.740m northeast of scheduled monument Cn153 (NGR SH59557100). The scheduled monument was originally identified by aerial photography in the early 1960's and then by subsequent excavation by C.Houlder in 1966-7, which revealed a complex multi-period site comprising elements from the early Neolithic to the Medieval period, incorporating the scheduled area and what is now an industrial estate to the west. The complex included two large henge monuments (Henge A and Henge B), from the late Neolithic, located within the industrial estate, with the western end of the cursus located between the two henges and continuing east into the area of the cricket pitch, c.40m south of the current clubhouse. In addition, within the industrial estate area, a timber post-built house dated to the Early Neolithic was identified, along with a small barrow of Early Bronze Age date, Iron Age settlement activity, limited Roman activity and an Early Medieval inhumation cemetery that included a small rectangular mortuary enclosure with a central grave (Lynch and Musson 2004)

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In 2005, to the south of the industrial estate and cricket club, GAT completed an archaeological excavation in advance of a business park development (GAT Report 764) located c.1.0km south of the proposed development. The excavation identified multiple features dating from the Early Neolithic to the medieval period overlaid by 18th and 19th century field boundaries (Kenny 2008, 9). The most significant discovery was the remains of an Early Neolithic rectangular timber building, preserved with numerous related features and assemblages of artefacts and ecofacts, and dated to between 3760-3700 cal. BC and 3670-3620 cal. BC. This was followed by several clusters of Mid to Late Neolithic pits, sixteen burnt mounds, the remains of a Middle Iron Age ring-groove roundhouse, overlaid by early medieval smithing activity, a Late Iron Age/Romano-British settlement and a medieval corn drier. The two areas of excavation (those undertaken in 1966/7 and those in 2005/6) are no more than 90.0m apart at the closest point and together form an area of landscape in which the prehistoric activity is most extensively revealed.

In 2011, at GAT completed geophysical survey of the northern end of the Bangor Cricket Club cricket field, which incorporates scheduled monument Cn153 (GAT, unpublished). The survey interpretation plan identified the end of the cursus and it appeared to be further east than previously thought. The other identifiable features appeared to be land drains. In 2009, GAT completed an archaeological evaluation at Unit 01 in the industrial estate (GAT Report 816). The evaluation area was located across the location of the cursus and medieval

cemetery and a 3m wide x 15m long trench was excavated. Part of the cursus as well as nine graves were identified, along with the tip of a tenth grave in the north-east facing section.

A geophysical survey of the area to the east of the proposed development was undertaken in 1992 at what is currently the location of the Bangor Cricket Club (Smith, 2005: 11; see Figure 3). Both magnetometer and resistivity surveys were undertaken. Numerous “anomalies” were recorded, including post-medieval field boundaries and tracks. The most significant feature was the continuation of the Cursus recorded during the 1966-67 excavation programme, whilst several circular features were identified as potential Bronze Age burial mounds (*ibid.*).

An aerial reconnaissance survey of northwest Wales was undertaken by RCAHMW in July 2005 (Toby Driver, *Archaeology in Wales*. Volume 45, 2005: 148). Two new cropmark enclosures were discovered in the park of Penrhyn Castle *c*.700m north of the development area. The first (Penrhyn Park Enclosure I (SH59627204) NPRN 403359) is an oval enclosure defined by a narrow ditch , *c*.148m east-west by *c*.84m north-south. It tapers to the west, towards the summit of a low ridge. Within the eastern part of the enclosure is a smaller square enclosure at *c*.SH59547204., of unknown date. Some 280m to the south is a second enclosure in a lower-lying setting: Penrhyn Park Enclosure II (SH59667175) NPRN 403367. This is a D-shaped ditched enclosure, possibly defensive, measuring *c*.63m northwest/southeast by 56m northeast/southwest. Bisected by modern field boundary. Surrounding these two main enclosures are extensive areas of pitting, linear features and smaller possible enclosures. The enclosures and associated markings were thought to, “most likely to belong to the prehistoric period” (Toby Driver, *Archaeology in Wales*. Volume 45, 2005: 148).

The Roman road between Caerhun and Segontium probably passed about 500m to the south-east of the development site, with the suspected site of a Roman fortlet at Tal-y-Bont.

3.1.4.3 Medieval Settlement

The nature of any Roman or earlier settlement is unknown, though the lack of evidence of finds from the excavations undertaken within the town centre may suggest the monastery was established on lands that were on the periphery of settlement, rather than on the site of a principal settlement.

The evidence for the development of Bangor in this early, formative, period comes from both historical and archaeological sources. It is of significance that, though the evidence is relatively slight, more survives from here than, with the exception of Clynnog, any other church in the Diocese.

Bangor is a word used to describe the horizontal plaited rods at the top of a wattle fence, and was still in use in the 19th century, when it could be defined as 'wattling rods thicker than the rest of the dead boughs, which are used on top to fasten the sett in making a thorn hedge',. It is thought that the term was applied to the enclosure around the monastery (the *vallum*), and later came to signify the church itself.

A collection of six carved stones of 10th to 11th century date lie within the Cathedral, and are indicative of Viking influence (RCAHMW 1960, 12; Edwards 2006). Though the relatively small pieces that remain are not easy to interpret, their presence implies the existence of a significant building here prior to the construction of the present cathedral.

Llandegai Church, consisting of a nave, chancel, central tower, north and south transepts and porch and vestry, was by tradition founded by Gwilym ap Griffith in the 14th century (PRN 6958; NGR SH60077098). However the first mention of the church occurs in the Norwich taxation of 1254 (Davidson 2000, 99), and the early churchyard is curvilinear in form. This suggests that the site may be early medieval in origin. The development area lies within the historic parish of Llandygai.

Development within Bangor in these centuries was relatively steady, but without the heady progress that was to mark the later 18th and 19th centuries. The friary and its lands were surrendered to the King in 1538, and after passing through several owners in quick succession it was bought by Geoffrey Glynne who founded the grammar school there (Roberts 1957). The land was kept largely undeveloped in a single block until the very late 19th century, thus ensuring an element of continuity throughout a lengthy period.

3.1.4.4 Post-Medieval Settlement

Browne Willis described the town in 1721 consisting 'of one long street and two small ones, and has sixty eight houses besides the Bishop's Palace and Deanery, most of which are slated' (Willis 1721, 40). The two small streets were Glanrafon and Lon Popty. Glanrafon is shown on Speed's map as being developed, whilst both are depicted with houses on Leigh's map of 1768 (Bangor Archives S2205). A small market was held every Friday, and three annual fairs (Willis 1721, 49). The majority of the buildings on the High Street were rebuilt in the 19th century, though two which retain 18th century features are the former Vaynol Arms at 137 High Street, and the former Goat public house at 120 High Street (RCAHMW 1960, 15-16).

The description of Bangor by Willis, and the depiction of the town in 18th century illustrations, reveals a relatively small settlement with between 100 and 200 houses and a population of approximately 1000. During the 18th century, however, changes occurred that were to transform Bangor. The first of these was the appointment of a sub-postmaster at Bangor in 1718. Whilst it is very probable the mails had regularly passed through Bangor prior to this, the official route was across the Lavan Sands to Beaumaris, which avoided the need to pass over Penmaenmawr, a dangerous part of the route. The adoption of the Porthaethwy ferry as the official postal route, and the establishment of a sub-postmaster in Bangor now ensured the town lay on the principal route between London and Dublin (Pritchard 1956; 1963). This would have considerably raised the number of travellers passing through, with the subsequent need for inns and other services. The Castle inn, sited in the centre of town, had 17th century origins and Willis in 1721 states that 'Bangor is well accommodated with inns' (Willis 1721, 50). The improvement of roads by turnpike trusts during the second half of the 18th century ensured a steady increase in numbers passing through. The importance of the road is highlighted by a number of contemporary writers, including John Evans, who, writing before the construction of Telford's new road, cites the 'great road between Dublin and London' running through Bangor as an incentive to live there (Evans 1812, 446).

3.1.4.5 Late 18th century development to 1900

Though a significant development, the presence of the London to Holyhead road through Bangor would not have been a sufficient catalyst to see any dramatic growth of the town. It was instead the development of the slate quarries by Richard Pennant that was to be the greater force for change. Pennant's inheritance and accumulation of the Penrhryn Estate, and his subsequent development of the slate quarries at Braich y Cafn has been well

described elsewhere (Lindsay 1974; National Trust 1992), but it was the need to transport the slates by ship to the their market and the subsequent development of the port at Abercegin that provided much of the demand for labour and the incentive to invest in new housing and industry. The harbour was developed from 1780, and was served by a tramway opened c. 1800 (Boyd 1985). Further up from the Cegin viaduct on the tramway, built in 1800, is Incline cottage, attributed to Benjamin Wyatt. There are twin cottage wings divided by the winding house at the top of the incline, and with arched recesses on the north gables. The Penrhyn park wall of the 1820s skirts round Incline Cottage, demonstrating that the industrial development predates the park wall (Haslam *et al.* 2009, 256).

In addition to the quarries, Pennant also developed subsidiary industries, particularly through his partnership with Samuel Worthington, including a flint grinding mill which involved importing flints from Suffolk and Ireland, and exporting them to Toxteth, and a factory for the production of writing slates that was to become the World's largest supplier (Boyd 1985). Both of these made use of the power supplied by the River Ogwen, and both were reliant upon transport by sea. Close to the port Pennant built a new hotel, the Penrhyn Arms, and an adjacent house at Pen y Bryn. These and the slightly later dispensary at Tan y Coed were all designed by Benjamin Wyatt in classical style. The combination of these buildings and the subsequent construction of the London to Holyhead road, gave a distinct status to the area, which was in marked contrast to the development that was to take place immediately below at Hirael.

Port Penrhyn was rebuilt in 1820 by George Hay Dawkins-Pennant, with the construction of a segmental arch with a decorative balustrade, providing an entrance to the port, with Tan y Coed to the right. The railroad passed under the road beyond the east end of the bridge, and continued past Port House, the office from which the port was run. In 1855 a third and more extensive reconstruction was carried out.

The growth of the port and quarries created the demand for a myriad of service industries, including shipbuilding, sail making, iron founding, smithing and timber yards, as well as slate yards for the processing of slate products. This all resulted in an increased demand for labour and new housing. Though there was ample room between the old town and the sea for development, ownership was divided amongst a number of estates, including Penrhyn, Friars School and the Bishop. Not all were free to develop their lands as they wished, but the first stirrings occurred when John Roberts leased from the Bishop, in 1805, a portion of the foreshore at Hirael for commercial and residential development. In 1808-9 Dean John Warren purchased land at Hirael, and leased other lands from the Bishop, and within 10

years it was developed as a settlement of houses, inns and industrial units, with a population of just over 1,000, many of them migrant workers (Jones 1991). Warren was central again to the development of another area of Bangor at Cae Sgybor, which became Dean Street. In 1808 he bought 8.79 acres of land from John Jones, laid out a grid system centred on Dean Street, and sold off the plots for development (Jones 1989). Both Hirael and Dean Street were developed as terraced workers housing, with the exception of Fairview, a large house on the outskirts of Hirael which was built for John Ambrose, the landlord of the Penrhyn Arms.

The new Holyhead Road, now the lower end of the High Street, was a catalyst for development within this area. One of the earliest signs of this was the construction of Friars Terrace by James Greenfield shortly after 1817, and though few others were as high status as this, the lower end of the High Street gradually filled up with shops and houses. Behind the High Street, Mountain Square was developed when Friars School sold off portions of land between 1806 and 1827 (Jones 1989, 151-2).

3.1.4.6 1900 to the present

The development of Bangor in the twentieth century is dominated by two themes. The first is the growth of colleges of higher education. The genesis of this belongs in the 19th century – the Normal College was founded in 1858, and moved to its new site overlooking the Menai Straits in 1862; St Mary's college moved to its site alongside Lôn Pobty in 1891, though the college had been founded in Caernarfon in 1846. Meanwhile in 1888 a new University, housed in the former Penrhyn Arms hotel, had been founded (see Williams 1985 for details). The sale of the Penrallt estate provided the ideal site for the construction of new University buildings, and these, designed by Henry Hare, completely altered the townscape of Bangor when the new college was constructed on the ridge overlooking the town. The expansion of the Normal College, in arts and crafts style, was also designed by Hare, and construction of both university and college was complete by 1911. In 1899 Friars school was moved to new premises on Ffriddoedd Road, in what was then open countryside, and to a building designed in Elizabethan style by John Douglas. This move freed up land within the valley for the development of Bangor.

The second strand was the development of social housing schemes, often linked to the demolition of 19th century terraced workers housing (this subject is covered in detail in Jones 1985). The Borough Council maintained an ambitious programme of slum clearance and house building between 1905 and the 1960's, the two single largest developments being

Maesgeirchen and Coed Mawr. Though the first houses were built in Sackville Road in 1905, the programme was slow to start, and pressure to improve came from several directions. A meeting of the 'Christian Order in Politics, Economics and Citizenship' (COPEC) was held in Bangor in 1924, following which a local housing group was founded. The group, using volunteers and some council help, surveyed the housing stock of Bangor, much of which was found to be of a low standard. The COPEC group next acquired land form the former Friars School estate, and had designed and built two terraces of ten houses on either side Seiriol Road. The houses were designed by H L North, and provided a model for the local authority, as they included a bath, lavatory and hot water boiler, none of which were included in the council houses (Jones 1986, 153-5). The council's programme of building developed greater significance after 1926, and despite a temporary halt during the Second World War, continued during the 1940's, 1950's and 1960's. During the pre-war period The Dean Street area was completely re-developed, and after the war so was much of Hirael. A number of large new housing estates were developed, such as those at Maesgeirchen, Maes Tryfan, and Coed Mawr, as well as smaller areas such as Maes Isalaw alongside Hirael. The new housing was largely designed by the council's surveyors, John Gill to 1924, T P Francis to 1929, and then most significantly B Price Davies, who oversaw a large part of the re-development programme, and was responsible for 'the sensitive arrangements of houses of differing sizes, height and block lengths on attractively laid out estates' (*ibid*, 189).

Later developments were influenced by the rise in importance of road transport. As cars, busses and lorries increased in number, so roads were adapted to cater for them. In the 1930's many roads were widened, and Beach Road, Garth Road and Deiniol Road were adopted as the new A5, designed to take traffic from the High Street.

3.1.4.7 Cartographic Evidence and History of Land Ownership

The study area has been the property of the Penrhyn Estate and its antecedents from at least the 16th century. Numerous maps relating to the Penrhyn estate holdings cover the area, most notably an estate map of 1768 which covers the area prior to arrival of the tramway (Bangor University Archives, Penrhyn MSS S2205; Figure 03). This shows the wider pre-industrial study area as forming part of a patchwork of irregular shaped fields, with the proposed development plot in Field H *Maes y Bont Isaf.* And Field G *Higher Gwern.* A map of 1803 shows the route of the tramway and the now called Incline Cottage in detail running through plot 17 (Bangor University Archives, Penrhyn Maps 40; Figure 04). By the time of the Llandygai parish tithe map of 1840 the study area is shown within plot 93, and the tramway is shown clearly as a black line (National Archives, Figure 05). The associated apportionment for the study area and the area adjacent is given below, with the numbers corresponding to those shown on the tithe map (Figure 05):

Landowner	**Occupiers**	**Numbers Referring to the Plan**	**Name and Description of Lands and Premeses**	**Quantities in Statute Measure**		
				A	**R**	**P**
The Honble Edward Gordon Douglas Pennant	Cornelius Roberts and others	93	Demesne out of the Park	133	-	31
	The Honble Edward Gordon Douglas Pennant	94	Demesne in the Park			
	James Wyatt Esquire	94b	Demesne out of the Park	14	2	27

The description of the study area (Plot 93) as ‘demesne out of the park’ indicates that it was land used for the benefit of Penrhyn Castle itself, but lay outside the ornamental parkland, and it was on this land that permission to build the tramway had been granted. The tenant of the adjacent land, plot 94b was James Wyatt, the land agent to the Penrhyn Estate who lived at Plas y Coed (Lime Grove) nearby. Penrhyn Castle Park (94) lay immediately to the east of the study area.

An examination of historic mapping in the latter part of the 19th century, including the First to Third Editions Ordnance Survey 25-inch to 1-mile County Series Map Sheet of the area (Figures 06-08), shows the proposed development area divided into three large plots, rather than the single plot currently. This included a square plot by the field entrance, which disappears between the 2nd (Figure 07) and 3rd edition (Figure 08) maps, therefore between 1890 and 1901, and also northern and southern plots sub-dividing the site; patches of woodland, still partly extant, are visible. A small structure or building 10m by 4m and orientated north northeast- south southwest [Feature 7] was located in the northeast corner of the southern plot within its own enclosure 14m long by 9m wide, at NGR SH59297185. It is shown on all three editions of the Ordnance Survey maps, and no trace of this is now visible on the ground. A small rectangular enclosure, 30m by 15m, orientated north northeast – south southwest and located at NGR SH5931472013, is also noted in the south east corner of the northern rectangular plot on the 1st and 2nd edition Ordnance Survey maps of 1890 and 1901, but it had gone by 1913, the date of the 3rd edition map [Feature 08].

The path leading to Incline cottage can be seen to have formerly crossed the northern plot diagonally from the north-west corner of the study area close to the railway to the cottage rather than east-west as the current track does now. Also the location of the bed of the former quarry tramway is clearly shown running north from Incline Cottage to the cutting in the woodland to the north of the site.

3.1.5 Previous Historical and Archaeological work

The proposed development is located c.740m northeast of scheduled monument Cn153 (NGR SH59557100). The scheduled monument was originally identified by aerial photography in the early 1960's and then by subsequent excavation by C.Houlder in 1966-7, which revealed a complex multi-period site comprising elements from the early Neolithic to the Medieval period, incorporating the scheduled area and what is now an industrial estate to the west. The complex included two large henge monuments (Henge A and Henge B), from the late Neolithic, located within the industrial estate, with the western end of the cursus located between the two henges and continuing east into the area of the cricket pitch, c.40m south of the current clubhouse. In addition, within the industrial estate area, a timber post-built house dated to the Early Neolithic was identified, along with a small barrow of Early Bronze Age date, Iron Age settlement activity, limited Roman activity and an Early Medieval inhumation cemetery that included a small rectangular mortuary enclosure with a central grave. In 2005, to the south of the industrial estate and cricket club, GAT completed an archaeological excavation in advance of a business park development (GAT Report 764) located c.1.0km south of the proposed development. The excavation identified multiple features dating from the Early Neolithic onwards. The most significant discovery was the remains of an Early Neolithic rectangular timber building, followed by several clusters of Mid to Late Neolithic pits, sixteen burnt mounds, the remains of a Mid Iron Age ring-groove roundhouse, overlaid by early medieval smithing activity, a Late Iron Age/Romano-British settlement and a medieval corn drier. The two areas of excavation (those undertaken in 1966/7 and those in 2005/6) are no more than 90.0m apart at the closest point and together form an area of landscape in which the prehistoric activity is more extensively

In 2011, at GAT completed geophysical survey of the northern end of the Bangor Cricket Club cricket field, which incorporates scheduled monument Cn153 (GAT, unpublished). The survey interpretation plan identified the end of the cursus and it appeared to be further east than previously thought. The other identifiable features appeared to be land drains. In 2009, GAT completed an archaeological evaluation at Unit 01 in the industrial estate (GAT Report 816). The evaluation area was located across the location of the cursus and medieval cemetery and a 3m wide x 15m long trench was excavated. Parts of the cursus, along with nine medieval graves, with the tip of a tenth grave in the north-east facing section, were identified during the excavation.

Probable prehistoric activity has been identified in the footprint of the Energy Centre Building at Penrhyn Castle, extant as small pit which included burnt stone (Jones 2017). The provenance of the feature is unclear but what this feature does signify is the survival of prehistoric activity despite extensive landscaping. It may represent transient domestic activity associated with a lighting a fire, and be associated with the archaeology of the wider surrounding area.

An aerial reconnaissance survey of northwest Wales was undertaken by RCAHMW in July 2005 (Toby Driver, *Archaeology in Wales*. Volume 45, 2005: 148). Two new cropmark enclosures were discovered in the park of Penrhyn Castle *c*.700m north of the development area. The first (Penrhyn Park Enclosure I (SH59627204) NPRN 403359) is an oval enclosure defined by a narrow ditch, *c*.148m east-west by *c*.84m north-south. It tapers to the west, towards the summit of a low ridge. Within the eastern part of the enclosure is a smaller square enclosure at NGR SH59547204, and is of an unknown date. Some 280m to the south is a second enclosure in a lower-lying setting: Penrhyn Park Enclosure II (SH59667175) NPRN 403367. This is a D-shaped ditched enclosure, possibly defensive, measuring *c*.63m northwest/southeast by 56m northeast/southwest, bisected by a modern field boundary. Surrounding these two main enclosures are extensive areas of pitting, linear features and smaller possible enclosures. The enclosures and associated markings were thought to, "most likely to belong to the prehistoric period" (*ibid.*).

A very significant volume of work has been carried out on the role of transport and the slate industry in the study area, and on Penrhyn Park, covering the post-medieval period. This includes Barker and Gwyn's, *Gwynedd Slate Industry Transport Routes* (2017) and Davidson and Gwyn's, *Gwynedd Slate Industry Transport Routes* (GAT 2014). The history of Telford's A5 road in the study area is covered in Quartermaine*,* Trinder and Turner's *Thomas Telford's Holyhead Road. The A5 in North Wales* (2003). Further archaeological reports relating to the industrial sites in the wider area, and the Penrhyn estate, are listed in the bibliography.

3.1.6 Artefact Potential

The potential for the survival of artefacts is unknown, but prehistoric and medieval artefacts may survive associated with prehistoric or medieval features, as very significant archaeological sites are known to exist in the wider landscape. As the area is close to the Afon Cegin, this might take the form of activity associated with burnt mounds or perhaps in the form of middens. Isolated and unstratified finds of post-medieval, industrial and modern artefacts are likely to be recovered, along with material associated with the occupation of the Penryn Estate and the associated tramway from the 18th century onwards. The potential for the recovery of artefacts of all periods is therefore considered to be moderate to high.

3.1.7 Aerial Photographs and LiDAR

3.1.7.1 Aerial Photographs

The following historic vertical aerial photograph was examined:

- RAF 106G/UK655 frame 4033 taken on 13th August 1945 (Figure 08)

The image was clear and showed the study area in detail. Incline cottage is clearly shown, but no extra historic or archaeological detail was observed within or around the study area that had not been observed on the cartographic or other sources. In the wider area the Maesgeirchen estate is shown prior to its more recent expansion, and the image was prior to the development of the Llandygai Industrial Estate at the end of the 1960s. Surviving boundaries generally remain as those shown on the aerial photograph.

3.1.7.2 LiDAR

LiDAR dtm 1m data was examined for OS grid squares SH5971 and SH5972 on the Welsh Government's *Lle* portal. The topography of the area, including incline cottage and the route of the former tramway were clearly shown, however no additional archaeological detail was observed that had not been noted on other sources.

3.2 Walkover Survey

The walkover survey was carried out on 10th September 2020 in dry and sunny weather conditions, although the ground remained somewhat wet from previous heavy rain. The conditions were however very suitable for the survey.

The study area was noted to consist of a field of improved grassland, and is accessed across a metalled track running east west across the northern part of the site, and leading to Incline cottage (Plate 1). It is bounded to the west by the A5, with some possible embankment and revetment walling of Telford's 1819 road surviving at the southern end (Plate 2). To the east is bounded by the Penrhyn estate demesne wall (Plates 3-4), Incline cottage and garden (Plates 5-6), and the former quarry tramway, which almost meets at a point with the A5 road at the southern point of the study area (Plate 7). Close to this point, about 10m from the southern point, an opening with an iron gate was noted in the Penrhyn estate wall [Feature 01, Plate 8], 7m west of the road embankment. A well-built slate drinking trough of Penrhyn quarry slate was noted in the middle of the field [Feature 03, Plate 9]. Its character fits well with this part of the estate being used as part of the home farm for the direct support of the estate, although it was outside the park itself.

The field itself is heavily undulating with a raised central are, at a height of about 23m OD (Plate 10). The land slopes sharply to the north, with one noticeable east-west ridge crossing it before sloping down to the northeast corner. The land south of the central raised area slopes more gently to a southern point where the A5 and the Penrhyn boundary wall almost meet, with a long narrow tail of land. The land immediately east of the A5 is for the most part more low-lying and boggy than the rest of the field (Plate 11), however in the central part of the field the land drops off to the west, suggesting a cutting for Telford's A5 road. Woodland bounds the study area to the north, and includes mature trees of oak and ash, and possible specimen park trees (Plate 12).

Incline cottage (Plates 5-6) is located about half way along the eastern side, with a gap in the Penrhyn boundary wall allowed the cottage to straddle the former tramway, and a garden on the western and eastern sides. Incline cottage pre-dates the wall so the latter respects the building. The quarry tramway is now partly taken up by a modern trackway leading to Nursery cottage to the northeast (Plate 13). Beyond the site boundary to the north in woodland the route of the tramway can be observed going through a cutting (Plate 15), after going out of use the tramway route was crossed by Penrhyn style estate fencing (Plate 14).

The Penrhyn Park boundary wall then runs to the east of the former tramway in a northerly direction.

No clear evidence of buried archaeological features was noted within the field. The site is somewhat terraced to the east below Incline Cottage (Plate 16). This may be a natural feature, but would also be a suitable place for prehistoric and later settlement. Its closeness to the Afon Cegin would make it a suitable location for burnt mounds. The presence of archaeology is considered to be moderately likely given the closeness of the site to the major excavations at the Llandygai Industrial Estate and Parc Bryn Cegin where substantial prehistoric and medieval archaeology was encountered.

3.3 Geophysical Survey

3.3.1 Introduction

The survey grid was projected from two baselines with endpoint coordinates of NGR SH 59220.340; 72122.920 / SH59261.960; 71624.660 and NGR SH 59268.037; 71685.303 / SH59321.296; 71600.666. The second baseline ran along the narrow strip at the south of the survey.

3.3.2 Survey conditions

The survey area comprised a single long field of 2.25 ha bounded by Llandygai Road on the west and the Penrhyn park boundary wall on the east. The field contained long uncut grass with patches of nettles and thistles which slowed down the survey but made no appreciable difference to the results. The edges of the field were overgrown in places with blackthorn and brambles. These areas could not be surveyed. Fences and passing vehicles produced ferrous anomalies beside Llandygai Road.

Figure 11 shows the raw data clipped to +-15nT. There is some striping due to a slight sensor mismatch on calibration. This was corrected with the destripe function set to 0.5 SD and the data was clipped to +-12nT on the processed greyscale plot (Figure 12). The results were generally in the range of either +-15nT, typical for archaeological features, or above +-100nT indicating ferrous responses. This can be differentiated on the greyscale plot so a trace plot has not been included.

Specific anomalies were transcribed and allocated numerical labels. These are shown on the interpretation plot (Figure 13), listed in Table 1 and discussed in the text. Individual iron spikes caused by rubbish in the soil were not transcribed. Specific anomalies have also been included in the gazetteer as features (cf.

Number	*Category*	Description	Provisional date
1	*Ridge and Furrow*	Widely spaced parallel anomalies, 7.0m apart orientated E-W. Perhaps ridge and furrow or possibly drainage. They are not aligned with the earlier boundaries 4 and 13.	Medieval or later
2	*Agriculture (ploughing)*	Parallel anomalies orientated N-W. Modern ploughing; possibly more than one phase	Modern
3	*Modern track*	Current access road to Incline Cottage and Nursery Cottage	Modern
4	*Field boundary*	Double parallel anomaly, a double ditch and bank field-boundary. This is shown on the Penrhyn Estate Map of 1803. It follows the break of slope (see 5)	Shown on the Penrhyn Estate Map of 1803.
5	*Geology or field boundary*	A diffuse anomaly corresponding to a break of slope/terrace in the field. This could be a geological feature or a substantial lynchet	Corresponds to boundary on Penrhyn Estate Map of 1803 but could be Iron Age or Medieval
6	*Field boundary*	Field boundary associated with 5 but not a continuation of 4	Predates the 1803 map
7	*Ferrous*	A linear cluster of ferrous material either part of former field boundary 4 or 7 or a collection of material collected at the base of slope	Before 1803 or modern
8	*Field boundary*	Weak positive linear anomaly, probably a field boundary	Earlier than the 1803 mapping, poss. post-medieval
9	*Field boundary*	Fairly strong positive anomaly corresponding to boundary on 1889 OS map	Shown on 1889 map
10	*Field boundary*	Very faint anomaly field boundary shown on 1889 map	Shown on 1889 map
11	*Field drain or service*	Narrow linear anomaly. Probably a field drain or pipe	Modern
12	*Field drain or service*	Narrow linear anomaly. Probably a field drain or pipe running to trough 23	Modern
13	*Field boundary or archaeology*	Double parallel anomaly, a double ditch and bank field-boundary shown on the Penrhyn Estate Map of 1803	Shown on the Penrhyn Estate Map of 1803.
14	*Field boundary/enclosure*	Curvilinear positive anomaly. Presumably a ditch, either a field boundary or an enclosure. 15 may be a continuation	Earlier than 1803 mapping, poss. Iron age
15	*Field boundary or archaeology*	Short length of linear or curvilinear anomaly. Possibly a continuation of 14	Earlier than 1803 mapping, poss. Iron age

Number	*Category*	Description	Provisional date
16	*Field boundary*	Positive linear anomaly, probably a field boundary	Earlier than 1803 mapping, poss. post-medieval
17	*Archaeology*	Linear area of moderately enhanced magnetic responses, corresponding to the Penrhyn slate railroad track-bed	18th/19th century
18	*Ferrous*	Fence and vehicles on the adjacent road	Modern
19	*Ferrous*	Fence and vehicles on the adjacent road	Modern
20	*Ferrous*	Roughly rectangular spread of ferrous fragments corresponding to enclosure on OS 1889 map	Shown on 1889 map
21	*Ferrous*	Cluster of ferrous responses, possible remnants of a small building or other structure.	Post-med to modern
22	*Ferrous*	Cluster of ferrous responses, possible remnants of a small building or other structure.	Post-med to modern
23	*Ferrous*	Cluster of ferrous responses, slate and iron water trough	19th Century
24	*Ferrous*	Cluster of ferrous responses, possible remnants of a small building or other structure.	Post-med to modern

Table 1: Magnetic anomalies detected by the survey

3.3.3 Summary

The survey produced a range of anomalies with relatively low levels of background magnetic noise. Modern ferrous responses along the edge of Llandygai road (18 and 19) did not have any major impact on the results apart from along the narrow strip at the south of the survey where it is not clear if the responses are a result of magnetic enhancement on the Penrhyn railroad bed or from the effects of the modern road and vehicles.

The two E-W boundaries shown on the 1890 25” OS map produced little or no anomalies suggesting that they were not ditched. Boundary 10 is visible only as a slight diffuse decrease in responses. Anomaly 20 is predominantly ferrous in nature suggesting that the boundary might have been a fence. Anomaly 9 is defined by an area of enhancement including some ferrous responses and corresponds to an enclosure and small building on the on the 1889 25” OS map.

Two double parallel linear anomalies (3 and 13) correspond closely to boundaries shown on the Penrhyn Estate Map of 1803. These appear to comprise a bank or hedge with a ditch on either side. Anomalies 8 and 16 also appear to be ditches and are aligned with the 1803 boundaries. These could be interpreted as further subdivisions of the same field system that had been removed by 1803. A curvilinear ditch, 14 possibly continuing to 15, can be assumed to predate the 1803 boundaries and could be interpreted as a prehistoric enclosure although ground investigation would be required to verify this.
A diffuse anomaly (6) also corresponding to boundaries 4 and a further ditch (5) and ferrous anomaly (7) is visible as a terrace in the field. This could have originated as a lynchet or Iron Age/medieval terraced field. It could alternatively be interpreted as a natural landform associated with the Afon Cegin valley.

The survey is crossed by two alignments of ploughing (1 and 2). The north/south alignment crosses boundary 13 so is probably relatively modern. The east/west alignment is more widely spaced at 7.0m. This could be interpreted as ridge and furrow; it can be seen across most of the field and bears no relation to the 1803 fields and crosses the southernmost 1890 boundary. This suggests that it either predates both sets of boundaries and is early or is a feature of recent agriculture.

The bed of the Penrhyn Railroad runs along the west side of the park wall to the south of incline cottage. This was generally overgrown and could not be surveyed in its entirety. The parts that could be surveyed produced moderately enhanced magnetic responses presumably as a result of material used in the track bed. This implies that there is some level of survival of the feature. A pile of material including corrugated iron sheets prevented survey of part of the railroad. This corresponds to a building shown on the 25” OS mapping to the south of Incline Cottage.

Four clusters of ferrous anomalies (21 to 24) are more complex than the ‘iron spikes’ from rubbish in the field. These are collections of iron objects. Anomaly 23 is the iron components of a slate water trough, the others are buried and could be interpreted in many ways. Possibilities are the remains of small buildings, machinery, other structures or even dumps of rubbish.

Two narrow negative anomalies (11 and 12) are typical of land drains or non ferrous pipe trenches. Anomaly 12 could be a water pipe for trough 23.

3.3.4 Data Appraisal and Confidence Assessment

Background levels of noise were generally low from both the geology and the glacial till. Archaeological features produced clearly-defined anomalies. The survey was therefore effective and would be expected to have identified most detectable archaeological anomalies. As in all geophysical surveys this cannot be a taken to mean that all archaeology has been identified as some features produce no anomalies or are too small to be detected.

3.4 Gazetteer of Features

All the features included in the gazetteer are shown on Figure 01. All recommendations are based on the current understanding of the scheme proposals and their impact on the features, and may have to be revised if information about the scheme impacts changes. In the event of alterations to the scheme, the recommendations might have to be revisited. A 'C' after the grid reference indicates the central point of a larger feature, and 'A' after the reference indicates the central point of a wider group of features. For the location of features cf. Figure 10.

Feature Number	**1 (Plates 7-8)**
Site name	Iron Gate in Penrhyn Park Boundary Wall
PRN number	90639
Grid reference	SH 5931471611
Period	Post-medieval
Site type	Wall
Assessment category	C
Description	An Iron gate in a 1.7m wide opening, with a 0.35m high stone step, in the Penrhyn Estate boundary wall. To the north, and at a height of 2m, iron railings top the wall for a length of about 10m. The northern pier is of a different style; regular slate and conglomerate blocks, compared to the southern pier which is in the same style as the estate wall of slate rubble, suggesting the gate is a replacement and the northern pillar was rebuilt, perhaps in the late 19th century
Impact	Slight
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Basic Recording

Feature Number	**2 (Plate 2)**
Site name	Revetted embankment for the A5
PRN number	90640
Grid reference	SH5931271608 C
Period	Post-medieval/modern
Site type	Transport
Assessment category	C
Description	3m high rubble blocks, both irregular and worked, with a 1.2m high plinth in places, for a revetment wall for the embankment of the A5, probably Telford's original pre 1819 work (Quartermaine *et al.* 2003, 52*)*. This is much overgrown with hawthorn and bramble, and becomes much less substantial and replaced with modern walling as it bounds the A5 northwards. The western side of the road has been entirely rebuilt in modern times.
Impact	Slight
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Basic Recording

Feature Number	**3 (Plate 9)**
Site name	Slate livestock drinking trough
PRN number	90641
Grid reference	SH5925371871
Period	Post-medieval
Site type	Agricultural
Assessment category	C
Description	Slate animal drinking trough 2m x 0.6m x 0.5m, constructed of slate slabs 0.1m thick. Now piped in, but clearly of some age, probably late 19th century, as the slate is of the Penrhyn quarried type. The slate slabs are bolted at both ends, with 0.6m wide end slabs to form a trough with a slate base.
Impact	Considerable
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Basic Recording

Feature Number	**4 (Plates 3-4, 7-8, 17-21)**
Site name	Penrhyn Estate Boundary Wall
PRN number	90642
Grid reference	SH59307183 C
Period	Post-medieval
Site type	Landscape Park
Assessment category	A
Description	A 19th century wall, up to 3m high and capped with rough slate blocks at right angles to the wall, bounding the demesne park of Penrhyn Castle. It is built of regular and irregular slate and shale masonry, and is damaged in a minor way in places.
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Basic Recording

Feature Number	**5 (Plates 5-6)**
Site name	Incline Cottage
PRN number	24862 [Listed Building Grade II Ref: 4085]
Grid reference	SH5930771924
Period	Post-medieval
Site type	Industrial/Domestic
Assessment category	A
Description	The building now converted to a residence and named 'Incline Cottage', stands at the head of the Marchogion railway incline and originated as the incline winding house. The 'railway' dates from 1798 when Benjamin Wyatt built a tramway to carry flint from Porth Penrhyn to a mill at Llandygai to be ground for Staffordshire's pottery industry. Horses pulled waggons along the valley of the Afon Cegin to the foot of the incline, and they were drawn up the incline by chains wound round a vertically mounted drum, probably powered by a horse gin. A further incline lowered the waggons from Llandygai village to the mill. In 1801 the tramway was extended from Llandygai to serve the Penrhyn slate quarries near Bethesda, with two further inclines, and most of the quarries' output travelled this route until 1879 when a new alignment avoiding the inclines came into use. With the majority of load passing downwards, gravity working could be used, using a horizontal winding drum. The building has an 'H' plan, suggesting that the winding drum was housed in the centre with waggons passing under it. The two side wings are constructed of fine ashlar and have classical proportions. It is thought that the east side was a stable, and the west side was living accommodation. It forms part of *The Penrhyn Slate Quarry Railroad and Penrhyn Slate Quarry Railway* (1.3) Element of Component Part 1 of the nominated *Slate Landscape of Northwest Wales* World Heritage Site.
Impact	None
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Avoidance

Feature Number	**6 (Plates 13-15, 21)**
Site name	Former Quarry Tramway (Marchogion Incline Plane) and Quarry Railway
PRN number	59451, 59452 65551
Grid reference	SH59347212 A
Period	Post-medieval
Site type	Industrial
Assessment category	A
Description	The formation of a double-track inclined plane forming part of the Penrhyn quarry railroad and the putative railway system of 1798-9 to the Llandygai (Penlan) flint mill. It is 193m in length, running from an elaborate winding house (NPRN: 409693; PRN: 24862) at SH 59309 71919, now converted to a residence, 'Incline Cottage' [Feature 05], to its foot at SH59347212, on a gradient of approximately 1 in 9, partly on a low causeway, partly in a shallow cutting defined by low stone walls. There is no observable surviving evidence of track or sleepers, but the cutting can be observed at the north of the study area and beyond (Barker and Gwyn, 2017; Plates 14-15). A 0.6 metre (2') gauge locomotive-operated railway build in stages in the 1870s to replace the Penrhyn quarry railroad of 1801. Though the route does not involve any major civil engineering features, it is steeply graded. It was designed by Charles Easton Spooner on the lines of the Ffestiniog Railway. It operated until 1962. It ran from the Felin Fawr slab mill complex (PRN: 21947) to Port Penrhyn (PRN: 15856). The railway's facilities for day-to-day operation were situated at Port Penrhyn and survive in good condition (PRN: 18456-18458). (Davidson and Gwyn, 2014). Identified as geophysical anomaly 17. This feature is being considered for designation as a Scheduled Monument. This will include a length of the Penrhyn railroad and tramway, from the Cegin Viaduct, Pont Marchogion, to Incline Cottage (Feature 5), which will run right along the eastern boundary to the site.
Impact	Considerable
Recommendation for further assessment/evaluation	None
Recommendation for mitigatory measures	Avoidance

Feature Number	**7 (Plate 23)**
Site name	Former Building within an Enclosure
PRN number	90643
Grid reference	SH59297185
Period	Post-medieval
Site type	Agricultural
Assessment category	E
Description	A small north northeast-south southwest orientated building 10m by 4m within an enclosure 14m by 9m is shown on the 1st-3rd edition 25 inch Ordnance Survey maps (Figures 06-08). It is not shown on either the earlier Penrhyn estate mapping (Figures 03-04), the tithe map (Figure 05) or later aerial photographs (Figure 08) or mapping and is not visible today on the ground. It is thought that it was a former agricultural building associated with the Penrhyn estate, and of probable 19th century date. Also identified in the geophysical survey as anomalies 9 and 10.
Impact	Considerable
Recommendation for further assessment/evaluation	Trial trenching
Recommendation for mitigatory measures	Await the results of the evaluation phase

Feature Number	**8**
Site name	Former Enclosure with two small associated structures
PRN number	90644
Grid reference	SH5931472013 C
Period	Post-medieval
Site type	Agricultural
Assessment category	E
Description	A small rectangular enclosure, 30m by 15m, orientated north northeast – south southwest, is also noted in the south east corner of the sub-rectangular northern plot on the 1st and 2nd edition Ordnance Survey maps of 1890 and 1901, but it had gone by 1913, the date of the 3rd edition map (Figure 08). The 2nd edition map of 1901 shows two small structures, less than 3m across to the south and southwest against the enclosure wall (Figure 07). The 1st edition map of 1890 shows the enclosure with internal divisions consistent with its use for market gardening, and the southern small building is shown (Figure 06). It is thought that it was a former agricultural building associated with the Penrhyn estate, and of probable 19th century date.
Impact	Considerable
Recommendation for further assessment/evaluation	Trial trenching
Recommendation for mitigatory measures	Await the results of the evaluation phase

Feature Number	**9**
Site name	Former field boundary
PRN number	90645
Grid reference	SH59287199 C
Period	Post-medieval
Site type	Agricultural
Assessment category	E
Description	A double parallel geophysical anomaly (anomaly 4), comprising a double ditch and bank field-boundary. This is shown on the Penrhyn Estate Map of 1803 (Figure 04) and follows the break of slope that included a diffuse geophysical anomaly that could either be a geological feature or a lynchet (Feature 10; geophysical anomaly 5)
Impact	Considerable
Recommendation for further assessment/evaluation	Trial trenching
Recommendation for mitigatory measures	Await the results of the evaluation phase

Feature Number	**10**
Site name	Geological feature or a substantial lynchet
PRN number	90646
Grid reference	SH59257196 C
Period	Prehistoric, medieval or post-medieval
Site type	Agricultural
Assessment category	E
Description	A diffuse geophysical anomaly (anomaly 5) corresponding to a break of slope/terrace in the field. This could be a geological feature or a substantial lynchet. Whilst the feature corresponds with a boundary on the Penrhyn Estate Map of 1803 (Figure 04) and it may be associated with Feature 9/geophysical anomaly 4, it may also be Iron Age or medieval in origin.
Impact	Considerable
Recommendation for further assessment/evaluation	Trial trenching
Recommendation for mitigatory measures	Await the results of the evaluation phase

Feature Number	**11**
Site name	Possible field boundary
PRN number	90647
Grid reference	SH59267193 C
Period	Prehistoric, medieval or post-medieval
Site type	Agricultural
Assessment category	E
Description	A field boundary identified as a geophysical anomaly (anomaly 6) that may associated with Feature 10/geophysical anomaly 5 but is not a continuation of Feature 9/geophysical anomaly 4, so likely predates the Penrhyn Estate Map of 1803 (Figure 04).
Impact	Considerable
Recommendation for further assessment/evaluation	Trial trenching
Recommendation for mitigatory measures	Await the results of the evaluation phase

Feature Number	**12**
Site name	Possible field boundary
PRN number	90648
Grid reference	SH59277190 C
Period	Post-medieval
Site type	Agricultural
Assessment category	E
Description	A weak geophysical linear anomaly (anomaly 8), probably a field boundary that predates the Penrhyn Estate Map of 1803 (Figure 04) but still possibly post-medieval.
Impact	Considerable
Recommendation for further assessment/evaluation	Trial trenching
Recommendation for mitigatory measures	Await the results of the evaluation phase

Feature Number	**13**
Site name	Possible field boundary/enclosure
PRN number	90649
Grid reference	SH59267184 C
Period	Prehistoric?
Site type	Agricultural
Assessment category	E
Description	A curvilinear geophysical anomaly (anomaly 14), interpreted as a ditch that may be either a field boundary or an enclosure. Feature 14 (geophysical anomaly 15) may be a continuation. Feature is earlier than the Penrhyn Estate Map of 1803 (Figure 04) and is possibly Iron Age.
Impact	Considerable
Recommendation for further assessment/evaluation	Trial trenching
Recommendation for mitigatory measures	Await the results of the evaluation phase

Feature Number	**14**
Site name	Possible field boundary or archaeology
PRN number	90650
Grid reference	SH59267184 C
Period	Post-medieval
Site type	Prehistoric
Assessment category	E
Description	A short length of linear or curvilinear geophysical anomaly (anomaly 15) that may be a continuation of Feature 13 (geophysical anomaly 14). Feature is earlier than the Penrhyn Estate Map of 1803 (Figure 04) and is possibly Iron Age.
Impact	Considerable
Recommendation for further assessment/evaluation	Trial trenching
Recommendation for mitigatory measures	Await the results of the evaluation phase

Feature Number	**15**
Site name	Possible field boundary
PRN number	90651
Grid reference	SH59277178 C
Period	Post-medieval
Site type	Agricultural
Assessment category	E
Description	A geophysical linear anomaly (anomaly 16), probably a field boundary that predates the Penrhyn Estate Map of 1803 (Figure 04) but still possibly post-medieval.
Impact	Considerable
Recommendation for further assessment/evaluation	Trial trenching
Recommendation for mitigatory measures	Await the results of the evaluation phase

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusion

Gwynedd Archaeological Trust was commissioned by Macbryde Group Limited to undertake an archaeological assessment and evaluation (geophysical survey) in advance of a proposed residential development on land at Llandygai Road, Bangor, Gwynedd. The proposed development area measures 2.51ha and is located within a field of improved pasture on the eastern side of Llandygai Road (Plates 1, 3, 6, 10-12, 16, 18, 20-22). The assessment and evaluation have been undertaken as part of a planning application for 67no two-storey dwellings with associated access and car parking. The development site has been allocated for housing within the Gwynedd and Isle of Anglesey County Council Joint Local Development Plan adopted in 2017 (reference T5).

The development site is within the Essential Setting of the Grade II* *Penrhyn Castle Registered Historic Park and Garden* (PGW (Gd) 40 (GWY)) and located within the *Dyffryn Ogwen Registered Landscape of Outstanding Historic Interest* (HLW (Gw) 10). It is important that the design of the development takes into consideration the impact that the development will have on these designated landscapes, especially the adjacent park and garden.

The study area was noted to be an improved pasture field, bounded to the east by relict tramway and Penrhyn estate infrastructure and park boundary, the west by Telford's A5 road, and to the north by mature woodland. Eight features were identified during the walk over survey, all of which were post-medieval in date, and all relate to the significance of the landscape as part of an aristocratic landscape park, and early industrial features relating to slate quarrying and transport routes.

The field itself was noted to have an undulating nature, with a central raised area sloping to both north and south, with some evidence for ridges present. The site is somewhat terraced to the west below Incline Cottage. This may be a natural feature, but would also be a suitable place for prehistoric and later settlement. Its closeness to the Afon Cegin would make it a suitable location for burnt mounds. Whilst no medieval or earlier features were clearly noted on the ground, the land is on the same plateau as the Llandygai Industrial estate and Parc Bryn Cegin, two major sites of prehistoric and later archaeology close by to the west of the site. The topography of the area, along with the very significant known archaeology in the vicinity, means that there is a moderate to high potential for the presence of buried medieval and earlier archaeological remains on the site. This was supported by the geophysical survey, which detected a range of possible archaeological features all of which would require

further characterisation or verification by a further programme of archaeological evaluation (trial trenching or targeted excavation).

4.2 Recommendations

Based on the results of the archaeological assessment and geophysical survey, basic recording is recommended for four features representing upstanding post-medieval activity, avoidance is recommended for the incline cottage and the location of the former tramway and archaeological trial trenching is recommended for seven features identified through map regression and the geophysical survey, which suggest former agricultural activity. Additional trenching is also recommended across the site to investigate the site in general. The results of the trenching should enable further archaeological recommendations.

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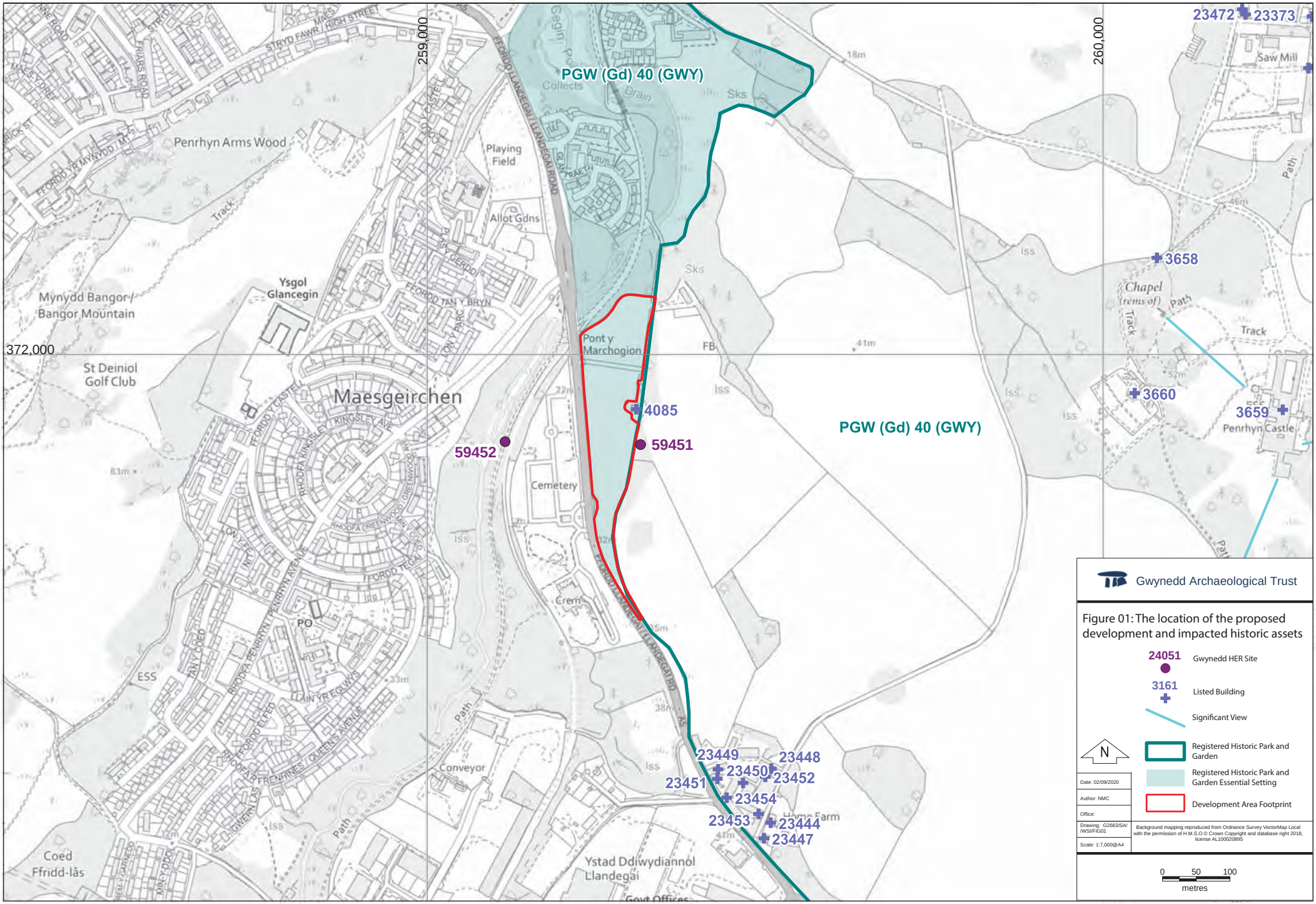
PGW (Gd) 40 (GWY)
PGW (Gd) 40 (GWY)
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260,000
372,000
Penrhyn Arms Wood
Playing Field
Allot Gdns
Ysgol Glancegin
Mynydd Bangor / Bangor Mountain
St Deiniol Golf Club
Maesgeirchen
Pont y Marchogion
Cemetery
Crem
Conveyor
Coed Ffridd-lâs
Ystad Ddiwydiannol Llandegai
Govt Offices
Saw Mill
Chapel (rems of)
Penrhyn Castle
Path
Track
Sks
Iss
FB
PO
ESS
59452
59451
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23447
Gwynedd Archaeological Trust
Figure 01: The location of the proposed development and impacted historic assets
24051
Gwynedd HER Site
3161
Listed Building
Significant View
N
Registered Historic Park and Garden
Registered Historic Park and Garden Essential Setting
Development Area Footprint
Date: 02/09/2020
Author: NMC
Office:
Drawing: G2663/SA/JWS/FIG01
Scale: 1:7,000@A4
Background mapping reproduced from Ordnance Survey VectorMap Local with the permission of H.M.S.O © Crown Copyright and database right 2018, license AL100020895
0 50 100
metres

Rev:	Description:	Date:
A:	General mix & layout amends.	18/01/20
B:	Pump Station added	09/06/20
C:	Additional Unit added	12/06/20
D:	-	12/08/20

MACBRYDE HOMES

Macbryde Homes Limited,
Macbryde House, Unit 28,
St. Asaph Business Park,
Ffordd Richard Davies, St Asaph,
Denbighshire. LL17 0LJ.
Tel. 01745 536677
Fax. 01745 536688

Site: Llandegai Road, Bangor

Title: Site Layout

Scale:	Date:
1:500@A0	03/03/2020

Ref:	Rev:
LRBANG-SL.01	D

Figure 03: Detail from a 1768 Penrhyn Estate Map of the Parish of Llandegai (Bangor Archives, Penrhyn MSS S2205), showing the landscape prior to the construction of the Penrhyn quarry tramway and estate boundary wall. Approximate study area outlined in red. Not to scale.

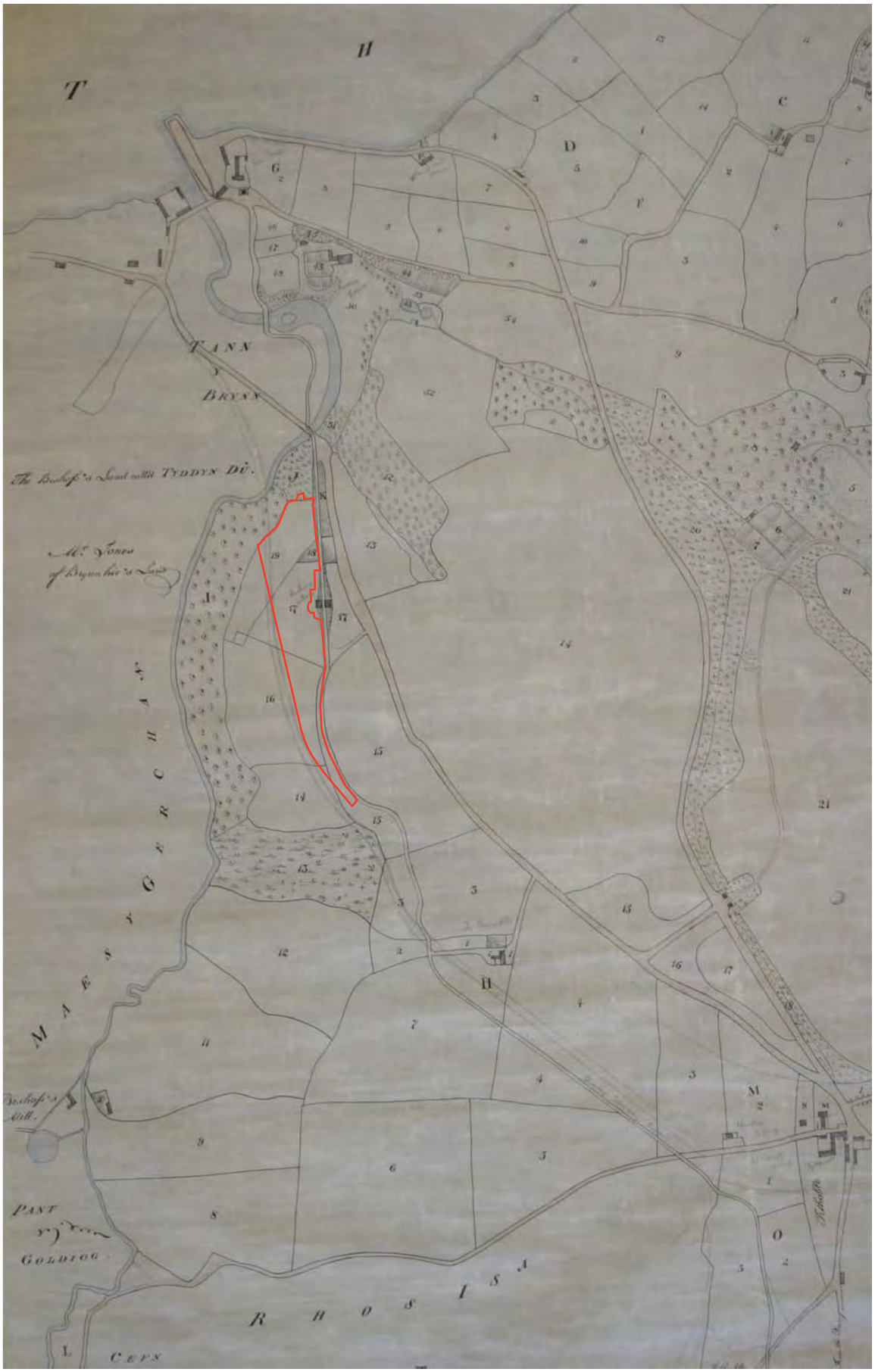

Figure 04: Detail form Penrhyn Estate Map of 1803 (Bangor Archives, Penrhyn Maps 40) showing the study area outlined in red, and the line of the former quarry tramway incline. Not to scale

Figure 05: Detail from the Llandygai Parish Tithe map of 1840 (National Archives) showing the study area. The tramway, Telford's A5 road and the relationship with Penrhyn Castle are clearly shown. Not to scale

Figure 06: First Edition Caernarvonshire County Series 25 inch Ordnance Survey Map of 1890, sheets VI.12 and VII.9, showing the study area outlined in red. Scale 1:5000@A4

Figure 07: Second Edition Caernarvonshire County Series 25 inch Ordnance Survey Map of 1900, sheets VI.12 and VII.9, showing the study area outlined in red. Scale 1:5000@A4

Figure 08: Third Edition Caernarvonshire County Series 25 inch Ordnance Survey Map of 1911, sheets VI.12 and VII.9, showing the study area outlined in red. Scale 1:5000@A4

Figure 09: RAF Aerial Photograph 106G/UK 655 frame 4033 taken on 13th August 1945 showing the study area outlined in red. Not to scale

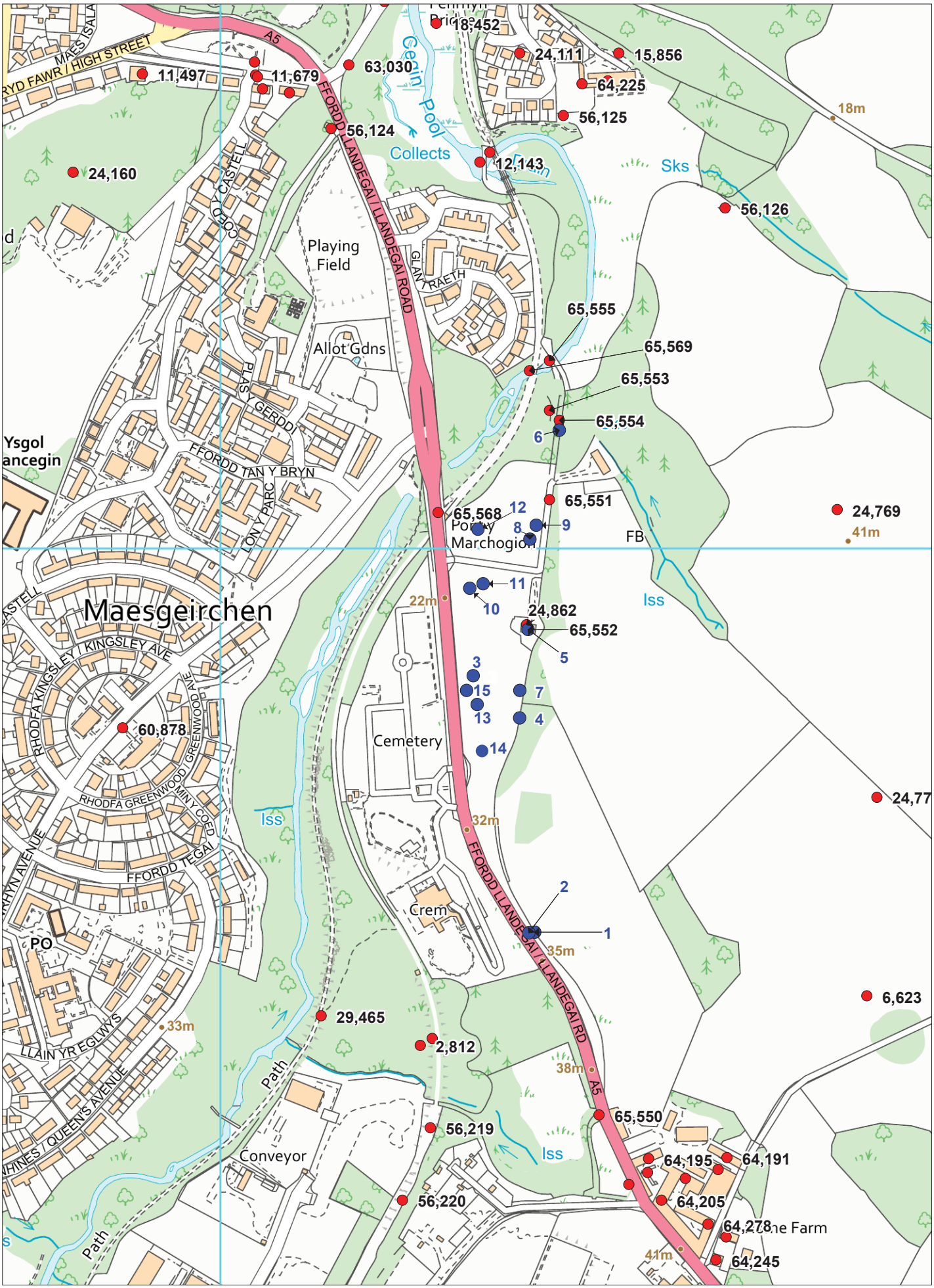

Figure 10: Feature location plan. Red dots are the sites located on the Gwynedd HER (Appendix II). Features listed in the gazetteer are shown in blue and numbered.
Base map taken from Ordnance Survey 1:10 000 Series sheet SH9235 Scale 1:5000@A4

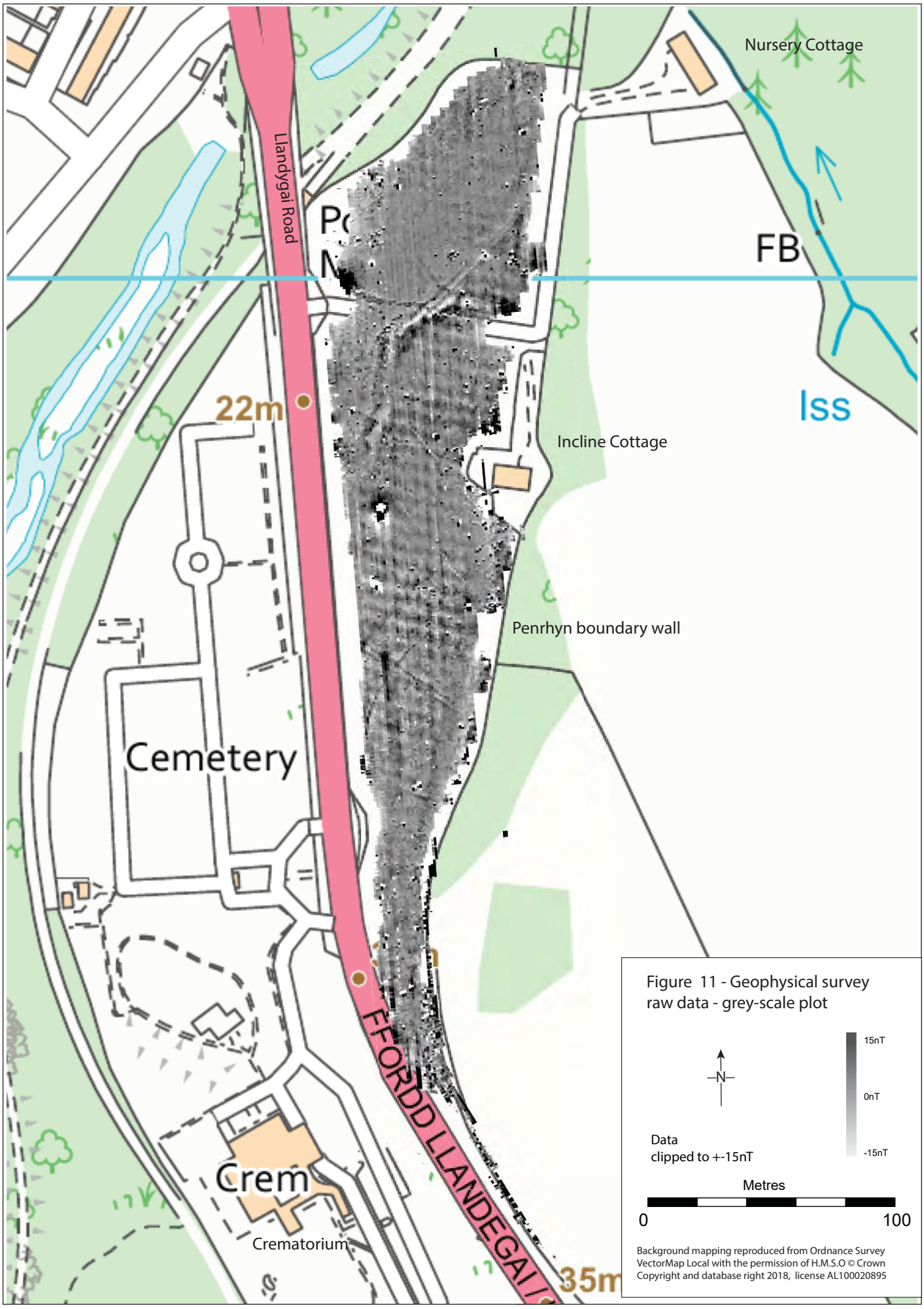

Figure 11 - Geophysical survey raw data - grey-scale plot

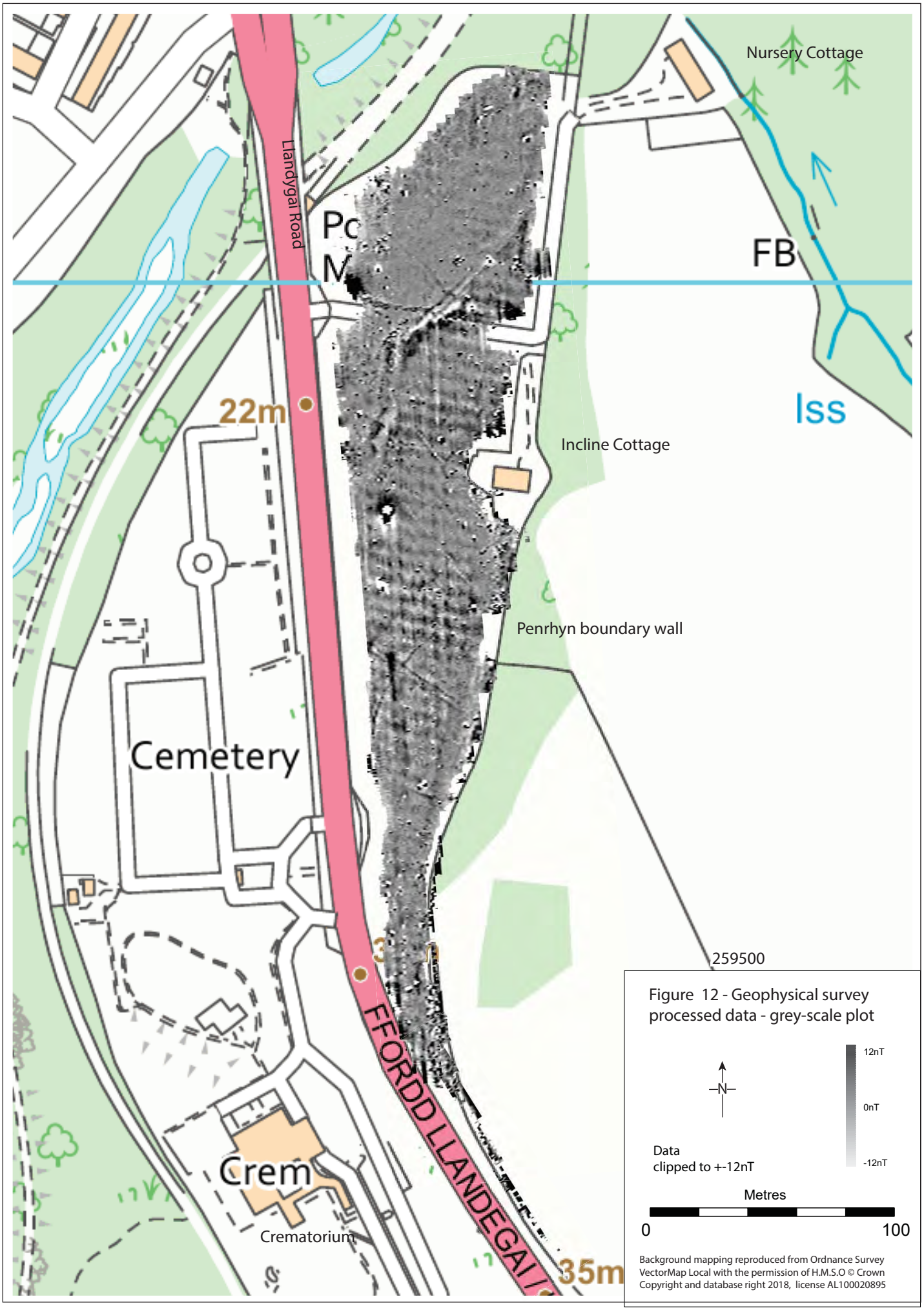

Figure 12 - Geophysical survey processed data - grey-scale plot

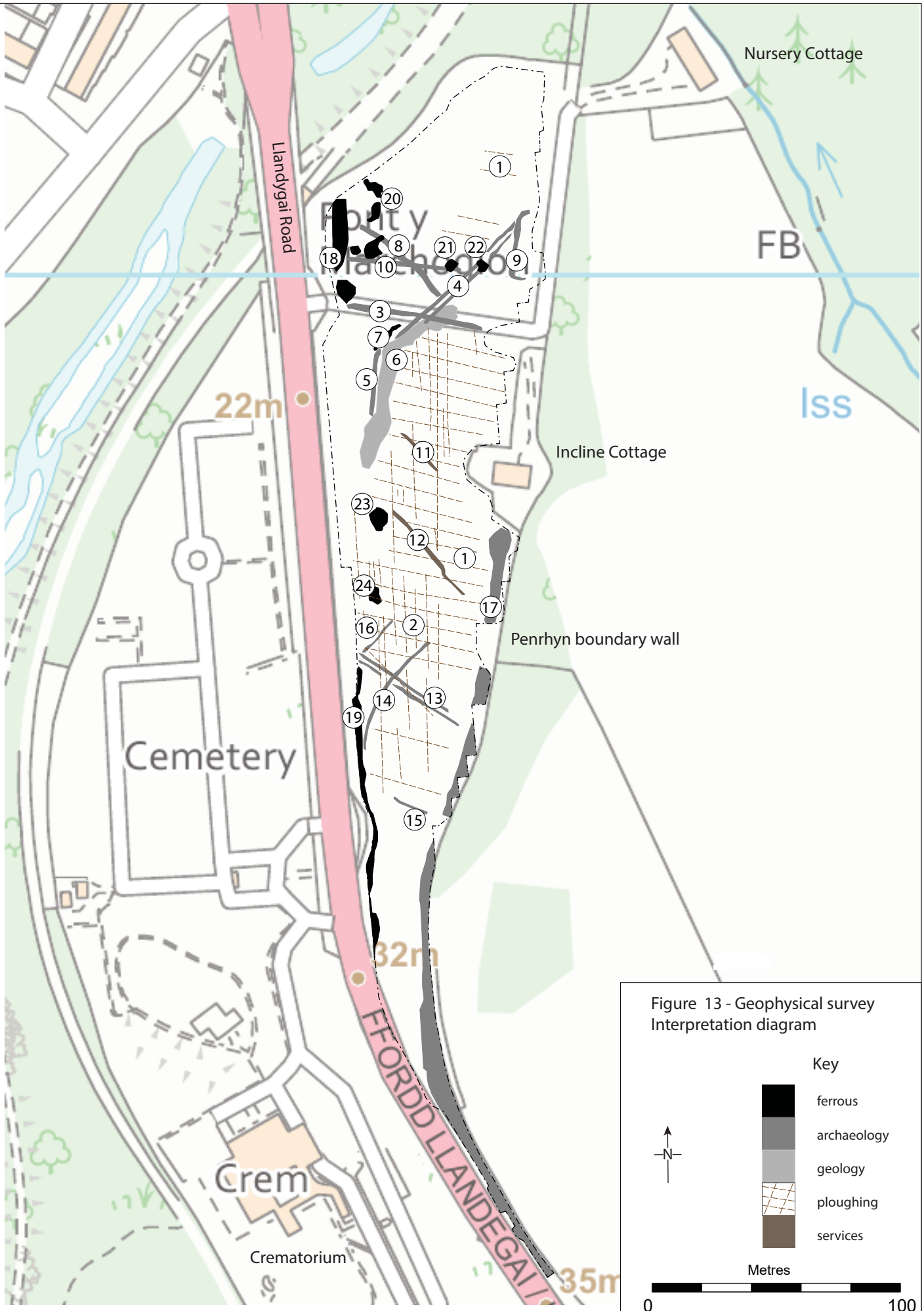

Figure 13 - Geophysical survey Interpretation diagram

Plate 1: General view along the access from the former tramway; scale 1x1m; view from E (archive reference: G2663_002).

Plate 2: View of rough stone revetted embankment on the west side of the site; the A5 road; scale 1x1m; view from SE (archive reference: G2663_021).

Plate 3: General view of southern narrow tip of the study area with the Penrhyn Estate wall to the west; scale 1x1m; view from N (archive reference: G2663_016).

Plate 4: Elevation view of the Penrhyn Demesne boundary wall; scale 1x1m; view from E (archive reference: G2663_017).

Plate 5: View of Incline cottage; scale not used; view from NE (archive reference: G2663_012).

Plate 6: View of Incline Cottage showing the associated 'D' shaped garden to the west; scale not used; view from SW (archive reference: G2663_015).

Plate 7: Angled view of Iron gate opening showing railings [Feature 1]; scale 1x1m; view from NW (archive reference: G2663_022).

Plate 8: General view of an Iron Gate and opening into the Penrhyn demesne through the estate boundary wall; scale 1x1m; view from S (archive reference: G2663_018).

Plate 9: View of slate animal drinking trough [Feature 3]; scale 1x1m; view from E (archive reference: G2663_027).

Plate 10: General view across the field showing the rising ground; scale not used; view from S (archive reference: G2663_024).

Plate 11: General view of low-lying boggy part of the field immediately south of the entrance trackway; scale 1x1m; view from N (archive reference: G2663_030).

Plate 12: General view of the sloping northern end of the field; scale not used; view from ESE (archive reference: G2663_008).

Plate 13: View along the lane that leads to Nursery Cottage, and Penrhyn Estate boundary wall; scale 1x1m; view from S (archive reference: G2663_013).

Plate 14: View of 'Penrhyn' slate fencing in the NE corner of the site and tramway route in a cutting beyond; scale 1x1m; view from S (archive reference: G2663_005).

Plate 15: Close up shot nshowing the former tramway in the cutting to the north of the study area; scale not used; view from S (archive reference: G2663_034).

Plate 16: View of Incline Cottage from the access trackway; scale not used; view from NNW (archive reference: G2663_014).

Plate 17: View of damage to Penrhyn Park boundary wall; scale 1x1m; view from W (archive reference: G2663_025).

Plate 18: General view across the field showing the Penrhyn park boundary wall; scale not used; view from SW (archive reference: G2663_023).

Plate 19: View of Penrhyn Park boundary wall with lane to Nursery Cottage, in the NE corner of the site beyond the lane; scale 1x1m; view from E (archive reference: G2663_004).

Plate 20: General view of study area showing incline cottage through the trees to the right; scale not used; view from S (archive reference: G2663_026).

Plate 21: View of Penrhyn Park boundary wall with lane to Nursery Cottage; scale 1x1m; view from E (archive reference: G2663_003).

Plate 22: General view of the study area; scale not used; view from SW (archive reference: G2663_010).

Plate 23: General view of Field showing Incline cottage; scale not used; view from W (archive reference: G2663_029).

APPENDIX I

Gwynedd Archaeological Trust Written Scheme of Investigation

LAND OFF LLANDYGAI ROAD, BANGOR, GWYNEDD (G2663)

WRITTEN SCHEME OF INVESTIGATION FOR ARCHAEOLOGICAL ASSESSMENT & EVALUATION (GEOPHYSICAL SURVEY)

Prepared for Macbryde Group Limited

September 2020

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

Approvals Table				
	Role	**Printed Name**	**Signature**	**Date**
Originated by	Document Author	John Roberts		04/09/20
Reviewed by	Document Reviewer	Robert Evans		04/09/20
Approved by	Principal Archaeologist	John Roberts		04/09/20

Revision History			
Rev No.	**Summary of Changes**	**Ref Section**	**Purpose of Issue**

All GAT staff should sign their copy to confirm the project specification is read and understood and retain a copy of the specification for the duration of their involvement with the project. On completion, the specification should be retained with the project archive:

Name Signature Date

LAND OFF LLANDYGAI ROAD, BANGOR, GWYNEDD (G2663)

WRITTEN SCHEME OF INVESTIGATION FOR ARCHAEOLOGICAL ASSESSMENT & EVALUATION (GEOPHYSICAL SURVEY)

Prepared for *Macbryde Group Limited*, September 2020

CONTENTS

1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) has been asked by Macbryde Group Limited to prepare a written scheme of investigation for an archaeological assessment and evaluation (geophysical survey) in advance of a proposed residential development on land at Llandygai Road, Bangor, Gwynedd, LL57 4HP (NGR: SH5928171847; Figure 01; Figure 02). The proposed development area measures 2.51 ha and is located within a field of improved pasture on the eastern side of Llandygai Road. The assessment and evaluation will be undertaken as part of a planning application for 67no. two-storey dwellings with associated access and car parking. The development site has been allocated for housing within the Gwynedd and Isle of Anglesey County Council Joint Local Development Plan adopted in 2017 (reference T5).

The assessment and evaluation will be undertaken in September 2020 and will conform to the following guidelines:

- *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* Version 1.1 (The Welsh Archaeological Trusts, 2018);
- *Guidelines for digital archives* (Royal Commission on Ancient and Historic Monuments of Wales, 2015);
- *Management of Archaeological Projects* (English Heritage, 1991);
- *Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide* (Historic England, 2015);
- *Standard and Guidance for Archaeological Geophysical Survey* (Chartered Institute for Archaeologists, 2014); and
- *Standard and Guidance for Historic Environment Desk-Based Assessment* (Chartered Institute for Archaeologists, 2017).

GAT is certified to ISO 9001:2015 and ISO 14001:2015 (Cert. No. 74180/B/0001/UK/En) and is a Registered Organisation with the Chartered Institute for Archaeologists and a member of the Federation of Archaeological Managers and Employers (FAME).

1.1 Monitoring Arrangements

The assessment and evaluation have been requested by Macbryde Group Ltd following feedback on a pre-planning consultation from Gwynedd Archaeological Planning Services (GAPS). The archaeological assessment and evaluation will be monitored by the Gwynedd archaeological Planning Service (GAPS); the content of this WSI and all subsequent reporting by GAT must be approved by GAPS prior to final issue.

1.2 Historic Environment Record

In line with the Gwynedd Historic Environment Record (HER) requirements, the HER will be contacted at the onset of the project to ensure that any data arising is formatted in a manner suitable for accession to the HER and follows the guidance set out in *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* (The Welsh Archaeological Trusts, 2018). The HER will be informed of the project start date, location including grid reference, estimated timescale for the work, and further relevant information associated with the project.

The GAT HER Enquiry Number for this project is GATHER1311 and the Event PRN is 45966. The GAT HER will also be responsible for supplying Primary Reference Numbers (PRN) for any new assets identified and recorded.

Prior to submission of data to the HER, a bilingual event summary document will be prepared in *Microsoft Word* based on the format defined in section 4.2 of *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* (Version 1.1).

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

A brief examination of the regional Historic Environment Record demonstrates that there are known heritage assets within proximity of the proposed development area; within the immediate area, the following assets have been identified (Figure 01):

- Grade II Listed Building Incline Cottage (LB 4085; GAT HER PRN 24862) adjacent to the proposed development site;
- The route of the Penrhyn Slate Quarry Railroad (GAT HER PRN 59451), which is part of the nominated The Slate Landscape of Northwest Wales World Heritage Site, runs adjacent to the site;
- The route of the Penrhyn Slate Quarry Railway (GAT HER PRN 59452), part of the nominated The Slate Landscape of Northwest Wales World Heritage Site, runs adjacent to the site; and

The development site is within the Essential Setting of the Grade II* *Penrhyn Castle Registered Historic Park and Garden* (PGW (Gd) 40 (GWY)) and the *Dyffryn Ogwen Registered Landscape of Outstanding Historic Interest* (HLW (Gw) 10). The effect of the proposed development upon these will be considered as part of the archaeological desk-based assessment.

The proposed development is located c.740m northeast of scheduled monument Cn153 (NGR SH59557100). The scheduled monument was originally identified by aerial photography in the early 1960's and then by subsequent excavation by C.Houlder in 1966-7, which revealed a complex multi-period site comprising elements from the early Neolithic to the Medieval period, incorporating the scheduled area and what is now an industrial estate to the west. The complex included two large henge monuments (Henge A and Henge B), from the late Neolithic, located within the industrial estate, with the western end of the cursus located between the two henges and continuing east into the area of the cricket pitch, c.40m south of the current clubhouse. In addition, within the industrial estate area, a timber post-built house dated to the Early Neolithic was identified, along with a small barrow of Early Bronze Age date, Iron Age settlement activity, limited Roman activity and an Early Medieval inhumation cemetery that included a small rectangular mortuary enclosure with a central grave.. In 2011, at GAT completed geophysical survey of the northern end of the Bangor Cricket Club cricket field, which incorporates scheduled monument Cn153 (GAT,

unpublished). The survey interpretation plan identified the end of the cursus and it appeared to be further east than previously thought. The other identifiable features appeared to be land drains. In 2009, GAT completed an archaeological evaluation at Unit 01 in the industrial estate (GAT Report 816). The evaluation area was located across the location of the cursus and medieval cemetery and a 3m wide x 15m long trench was excavated. Part of the cursus as well as nine graves were identified, along with the tip of a tenth grave in the north-east facing section.

In 2005, to the south of the industrial estate and cricket club, GAT completed an archaeological excavation in advance of a business park development (GAT Report 764) located c.1.0km south of the proposed development. The excavation identified multiple features dating from the Early Neolithic onwards. The most significant discovery was the remains of an Early Neolithic rectangular timber building, followed by several clusters of Mid to Late Neolithic pits, sixteen burnt mounds, the remains of a Mid Iron Age ring-groove roundhouse, overlaid by early medieval smithing activity, a Late Iron Age/Romano-British settlement and a medieval corn drier.

A brief examination of historic mapping, including the First to Third Edition Ordnance Survey 25-inch to 1-mile County Series Map Sheet of the area (Sheet VII.9; 1901), shows the proposed development area divided into three large plots, rather than the single plot currently. This included a square plot by the field entrance and northern and southern plots sub-dividing the site; patches of woodland, still partly extant, are visible.

3 METHODOLOGY

3.1 Assessment (Desktop Study)

A desk-based assessment is defined as “a programme of study of the historic environment within a specified area or site on land, the inter-tidal zone or underwater that addresses agreed research and/or conservation objectives. It consists of an analysis of existing written, graphic, photographic and electronic information in order to identify the likely heritage assets, their interests and significance and the character of the study area, including appropriate consideration of the settings of heritage….Significance is to be judged in a local, regional, national or international context as appropriate” (CIfA 2014, 4).

The desk-based assessment will involve a study of the following resources:

1. The regional Historic Environment Register ((HER) Gwynedd Archaeological Trust, Craig Beuno, Ffordd y Garth, Bangor, Gwynedd LL57 2RT) will be examined for information concerning the study area, defined as the highlighted plot in Figure 01 and the immediate environs. This will include an examination of the core HER, the 1:2500 County Series Ordnance Survey maps and any secondary information held within the HER. All identified features will be mapped, described and added to a gazetteer of sites and the relative importance of any sites defined;
2. The National Monuments Record of Wales (Royal Commission on the Ancient and Historical Monuments of Wales, Plas Crug, Aberystwyth SY23 1NJ) will be checked for sites additional to the HER;
3. Aerial photographs from the National Monuments Record of Wales (Royal Commission on the Ancient and Historical Monuments of Wales, National Monuments Record of Wales, Plas Crug, Aberystwyth SY23 1NJ) will be examined for potential features. This will include 1946 RAF vertical aerial photographs (including sortie 106G/UK 1468 2472);
4. On-line catalogue search of the National Library of Wales (Penglais Rd, Aberystwyth SY23 3BU);
5. Archive data, including primary and secondary sources, historic maps and estate maps will be examined at the regional archives (Caernarfon Record Office, Gwynedd Archive Service, Gwynedd Council, Caernarfon, LL55 1SH). The examination of the archive data will include historic mapping including the local tithe map and schedule. The Caernarfon Record Office archives will be open from the 9th September 2020 and they are currently operating an appointment only system, requiring documents to be

pre-ordered before any visit. The records office will need to be contacted a day or more in advance in order that documents can be retrieved and to ensure that the documents are available as all documents viewed by the public will be quarantined for a period of 72 hours. The documents are quarantined to ensure that our users and staff are kept safe when handling our collections. Documents can be ordered by browsing the online catalogue (sourced via https://diogel.gwynedd.llyw.cymru/DATRhagorol/default.aspx?iaith=en) and then contacting the record office with the choice of documents in order for staff to check availability by emailing mailto:archifau@gwynedd.llyw.cymru or phoning (01286) 679 095. The proposed development plot was part of the Penrhyn Estate and the Estate archives are currently held at the Bangor University Archives and Special Collections department which is closed until further notice due to Covid-19 restrictions; a limited enquiry service is available via email (archives@bangor.ac.uk);

6. Light Detection and Ranging (LiDAR) data will be examined from the Lle Geo-Portal at http://lle.gov.wales/home for information on potential surface features using digital terrain modelling and digital surface modelling;

3.2 Walkover Survey

A walkover survey will be undertaken that will incorporate the assessment area study area, defined as the highlighted plot in Figure 01. All known and new archaeological features on the ground will be located and described them on GAT pro-formas. The sites will then be added to the overall gazetteer and their relative importance defined. The potential for sub-surface archaeology will be estimated and defined.

A photographic record will be maintained in RAW format using a digital SLR set to maximum resolution (Nikon D3000; resolution: 3,872 × 2,592 [10.2 effective megapixels]) and photographic metadata table will be completed and included in the report. Photographic images will be archived in TIFF format; the archive numbering system will start from G2663_001. A handheld GPS unit will also be used during the walkover survey

3.3 Geophysical Survey

3.3.1 Summary

The geophysical survey will be undertaken by GAT and will incorporate the area defined as the red highlighted plot in Figure 01 and will be carried out in a series of 20m grids, which will be tied into the Ordnance Survey grid using a Trimble R8 high precision GPS system. The survey will be conducted using a Bartington Grad 601-2 dual fluxgate gradiometer with a 1.0m traverse interval and a 0.25m sample interval.

3.3.2 Instrumentation

The Bartington Grad 601-2 dual fluxgate gradiometer uses a pair of Grad-01-100 sensors. These are high stability fluxgate gradient sensors with a 1.0m separation between the sensing elements, giving a strong response to deeper anomalies. The instrument detects variations in the earth's magnetic field caused by the presence of iron in the soil. This is usually in the form of weakly magnetized iron oxides which tend to be concentrated in the topsoil. Features cut into the subsoil and backfilled or silted with topsoil, therefore contain greater amounts of iron and can therefore be detected with the gradiometer. This is a simplified description as there are other processes and materials which can produce detectable anomalies. The most obvious is the presence of pieces of iron in the soil or immediate environs which usually produce very high readings and can mask the relatively weak readings produced by variations in the soil. Strong readings are also produced by archaeological features such as hearths or kilns as fired clay acquires a permanent thermo-remnant magnetic field upon cooling. This material can also get spread into the soil leading to a more generalized magnetic enhancement around settlement sites. Not all surveys can produce good results as results can be masked by large magnetic variations in the bedrock or soil or high levels of natural background "noise" (interference consisting of random signals produced by material with in the soil). In some cases, there may be little variation between the topsoil and subsoil resulting in undetectable features. The Bartington Grad 601 is a hand held instrument and readings can be taken automatically as the operator walks at a constant speed along a series of fixed length traverses. The sensor consists of two vertically aligned fluxgates set 500mm apart. Their cores are driven in and out of magnetic saturation by a 1,000Hz alternating current passing through two opposing driver coils. As the cores come out of saturation, the external magnetic field can enter them producing an electrical pulse proportional to the field strength in a sensor coil. The high frequency of the detection cycle produces what is in effect a continuous output. The gradiometer can detect anomalies down

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

3.3.3 Data Collection

The gradiometer includes an on-board data-logger. Readings are taken along parallel traverses of one axis of a 20m x 20m grid. The traverse interval is 1.0m and readings are logged at intervals of 0.25m along each traverse. Marked guide ropes are used to ensure high positional accuracy during the high resolution survey. The data is transferred from the data-logger to a computer where it is compiled and processed using ArchaeoSurveyor2 software. The data is presented as a grey scale plot where data values are represented by modulation of the intensity of a grey scale within a rectangular area corresponding to the data collection point within the grid. This produces a plan view of the survey and allows subtle changes in the data to be displayed. This is supplemented by an interpretation diagram showing the main feature of the survey with reference numbers linking the anomalies to descriptions in the written report. It should be noted that the interpretation is based on the examination of the shape, scale and intensity of the anomaly and comparison to features found in previous surveys and excavations etc. In some cases the shape of an anomaly is sufficient to allow a definite interpretation e.g. a Roman fort. In other cases all that can be provided is the most likely interpretation. The survey will often detect several overlying phases of archaeological remains and it is not usually possible to distinguish between them. Weak and poorly defined anomalies are most 4 susceptible to misinterpretation due to the propensity of the human brain to define shapes and patterns in random background "noise". An assessment of the confidence of the interpretation is given in the text.

3.3.4 Data Processing

The data is presented with a minimum of processing although corrections are made to compensate for instrument drift and other data collection inconsistencies. High readings caused by stray pieces of iron, fences, etc. are usually modified on the grey scale plot as they have a tendency to compress the rest of the data. The data is however carefully examined before this procedure is carried out as kilns and other burnt features can produce similar readings. The data on some 'noisy' or very complex sites can benefit from 'smoothing'. Grey-scale plots are always somewhat pixellated due to the resolution of the

survey. This at times makes it difficult to see less obvious anomalies. The readings in the plots can therefore be interpolated thus producing more but smaller pixels and a small amount of smoothing based on a low pass filter can be applied. This reduces the perceived effects of background noise thus making anomalies easier to see. Any further processing is noted in relation to the individual plot.

3.3.5 Aims

The report will include a discussion of the grey scale plot and an interpretation of the any anomalies identified; these anomalies will be presented as either positive or negative, suggesting whether they could be cut features (ditches, pits etc.), or built sub-surface features (e.g., banks). Figures will be included for the grey scale plot and for the anomaly interpretation. The results of the geophysical survey will be used to inform further recommendations for archaeological evaluation and/or mitigation (if relevant)

3.4 Fieldwork Archiving

Following the completion of the respective assessment/evaluation stages, fieldwork archiving will be completed based on following task list:

1. Pro-formas: all cross referenced and complete;
2. Photographic Metadata: completed in *Microsoft Access* and cross-referenced with all pro-formas;
3. Geophysical survey data: downloaded using a Computer Aided Design package;

All data will be processed and a report will be produced which will detail and synthesise the results.

A gazetteer will be compiled for any existing and newly identified sites within the local area, based on information sourced from the desk based assessment and geophysical surve ; the gazetteer will be prepared in the following format and will include:

Feature Number	
Site name	
PRN number	
Grid reference	
Period	
Site type	
Assessment category	
Description	
Impact	
Recommendation for further assessment/evaluation	
Recommendation for mitigatory measures	

The following categories will be used to define the assessment category of the archaeological asset:

Category A - Sites of National Importance.
Scheduled Monuments, Listed Buildings of grade II* and above, as well as those that would meet the requirements for scheduling (ancient monuments) or listing (buildings) or both. Sites that are scheduled or listed have legal protection, and it is recommended that all Category A sites remain preserved and protected *in situ*.

Category B - Sites of regional or county importance.
Grade II listed buildings and sites which would not fulfil the criteria for scheduling or listing, but which are nevertheless of particular importance within the region. Preservation *in situ* is the preferred option for Category B sites, but if damage or destruction cannot be avoided, appropriate detailed recording might be an acceptable alternative.

Category C - Sites of district or local importance.

Sites which are not of sufficient importance to justify a recommendation for preservation if threatened. Category C sites nevertheless merit adequate recording in advance of damage or destruction.

Category D - Minor and damaged sites.

Sites that are of minor importance or are so badly damaged that too little remains to justify their inclusion in a higher category. For Category D sites, rapid recording, either in advance of or during destruction, should be sufficient.

Category E - Sites needing further investigation.

Sites, the importance of which is as yet undetermined and which will require further work before they can be allocated to categories A - D are temporarily placed in this category, with specific recommendations for further evaluation.

The impact of the proposed works on any asset will be identified using the following impact criteria, defined either as *none, slight, unlikely, likely, significant, considerable or unknown* as follows:

None:

There is no construction impact on this asset.

Slight:

This has generally been used where the impact is marginal and would not by the nature of the site cause irreversible damage to the remainder of the asset, *e.g.* part of a trackway or field bank.

Unlikely:

This category indicates sites that fall within the band of interest but are unlikely to be directly affected. This includes sites such as standing and occupied buildings at the margins of the band of interest.

Likely:

Sites towards the edges of the study area, which may not be directly affected, but are likely to be damaged in some way by the construction activity.

Significant:

The partial removal of an asset affecting its overall integrity. Assets falling into this category may be linear features such as roads or tramways where the removal of part of the feature could make overall interpretation problematic.

Considerable:

The total removal of an asset or its partial removal which would effectively destroy the remainder of the site.

Unknown:

This is used when the location of the asset is unknown, but thought to be in the vicinity of the proposed works.

3.5 Data processing and report compilation

Following completion of the stages outlined above, a report will be produced incorporating the following:

1. Front cover;
2. Inner cover;
3. Figures and Plates List;
4. Non-technical summary (Welsh/English);
5. Introduction;
6. Methodology;
    i. Desk-based assessment;
    ii. Walkover survey;
    iii. Geophysical survey;
7. Results;
    a. Desk based assessment;
        i. Location and geological summary;
        ii. Statutory and non-statutory designations;
        iii. Environmental remains and soil morphology;
        iv. Historical and archaeological background;
        v. Cartographic evidence;
        vi. Artefact potential;
        vii. Aerial photographs and LiDAR;
    b. Walkover survey;
    c. Geophysical survey
    d. Gazetteer of features;
8. Conclusions and recommendations;
    a. Conclusion;
    b. Table of sites and recommendations;
9. Acknowledgements;
10. Bibliography;
    a. Primary sources;
    b. Secondary sources;
11. Figures; inc.:
    - location plan;
    - historic mapping;
    - location plan with identified features;
    - grey scale plot;
    - anomaly identification and interpretation;
12. Appendix I (approved written scheme of investigation);
13. Appendix II (Sites listed on GAT Historic Environment Record);
14. Appendix III (Definition of mitigation terms);
15. Appendix IV (Photographic metadata - walkover survey);
    Back cover.

Illustrations will include plans of the location of the study area and archaeological sites. Historical maps, when appropriate and if copyright permissions allow, will be included.

A full archive including plans, photographs, written material and any other material resulting from the project will be prepared. The archaeological assessment outlined in this written scheme of investigation will be submitted in draft format in August 2020; a final report will be submitted to the Historic Environment within six months of submitting the draft report (February 2021).

The following dissemination will apply:

- A digital report(s) will be provided to the client/consultant and GAPS (draft report then final report);
- A paper report plus a digital report will be provided to the regional Historic Environment Record, Gwynedd Archaeological Trust; this will be submitted within six months of project completion (final report only), along with any relevant, digital information such as the project database and photographs. All digital datasets submitted will conform to the required standards set out in *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* (Version 1.1); and
- A digital report and archive (including photographic and drawn) data will be provided to Royal Commission on Ancient and Historic Monuments, Wales (final report only), in accordance with the *RCAHMW Guidelines for Digital Archives Version 1*. Digital information will include the photographic archive and associated metadata.

4 PERSONNEL

The project will be managed by John Roberts, Principal Archaeologist GAT Contracts Section. The desk based assessment will be completed by a Project Archaeologist who will have responsibility for completing compiling the gazetteer, preparing the site archive, liaising with GAPS and *Macbryde Group Limited* and preparing the draft report and final report. The geophysical survey will be undertaken by GAT. The survey results will be incorporated into the assessment report and included in the gazetteer. The project manager will be responsible for reviewing and approving the report prior to submission.

5 INSURANCE

5.1 Public/Products Liability

Limit of Indemnity- £5,000,000 any one event in respect of Public Liability
INSURER Aviva Insurance Limited
POLICY TYPE Public Liability
POLICY NUMBER 24765101CHC/UN/000375
EXPIRY DATE 21/06/2021

5.2 Employers Liability

Limit of Indemnity- £10,000,000 any one occurrence.
The cover has been issued on the insurers standard policy form and is subject to their usual terms and conditions. A copy of the policy wording is available on request.
INSURER Aviva Insurance Limited
POLICY TYPE Employers Liability
POLICY NUMBER 24765101 CHC / UN/000375
EXPIRY DATE 21/06/2021

5.3 Professional Indemnity

Limit of Indemnity- £5,000,000 in respect of each and every claim
INSURER Hiscox Insurance Company Limited
POLICY TYPE Professional Indemnity
POLICY NUMBER PL-PSC10002389775/00
EXPIRY DATE 22/07/2021

6 SOURCES CONSULTED

1. English Heritage, 1991, Management of Archaeological Projects
2. English Heritage, 2015, Management of Research Projects in the Historic Environment (MoRPHE).
3. *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* (Version 1.1)
4. Kenney, J. 2008. Recent Excavations at Llandygai, near Bangor, North Wales. Gwynedd Archaeological Trust Report 764.
5. Oattes, A M, 2019. Bangor Cricket Club, Llandygai Archaeological Watching Brief. Gwynedd Archaeological Trust Report 1489.
6. Ordnance Survey First Edition 1-inch to 25-mile County Series Map Sheets XV.13 (1889) and VII.1 (1889)
7. Rees, C. 2009. Archaeological Evaluation: Llandygai Industrial Estate. Gwynedd Archaeological Trust Report 816.
8. Royal Commission on Ancient and Historic Monuments of Wales 2015 *Guidelines for digital archives*
9. *Standard and Guidance for Archaeological Geophysical Survey* (Chartered Institute for Archaeologists, 2014).
10. *Standard and Guidance for Historic Environment Desk-Based Assessment* (Chartered Institute for Archaeologists, 2017).

FIGURE 01

The location of the proposed development and local historic assets

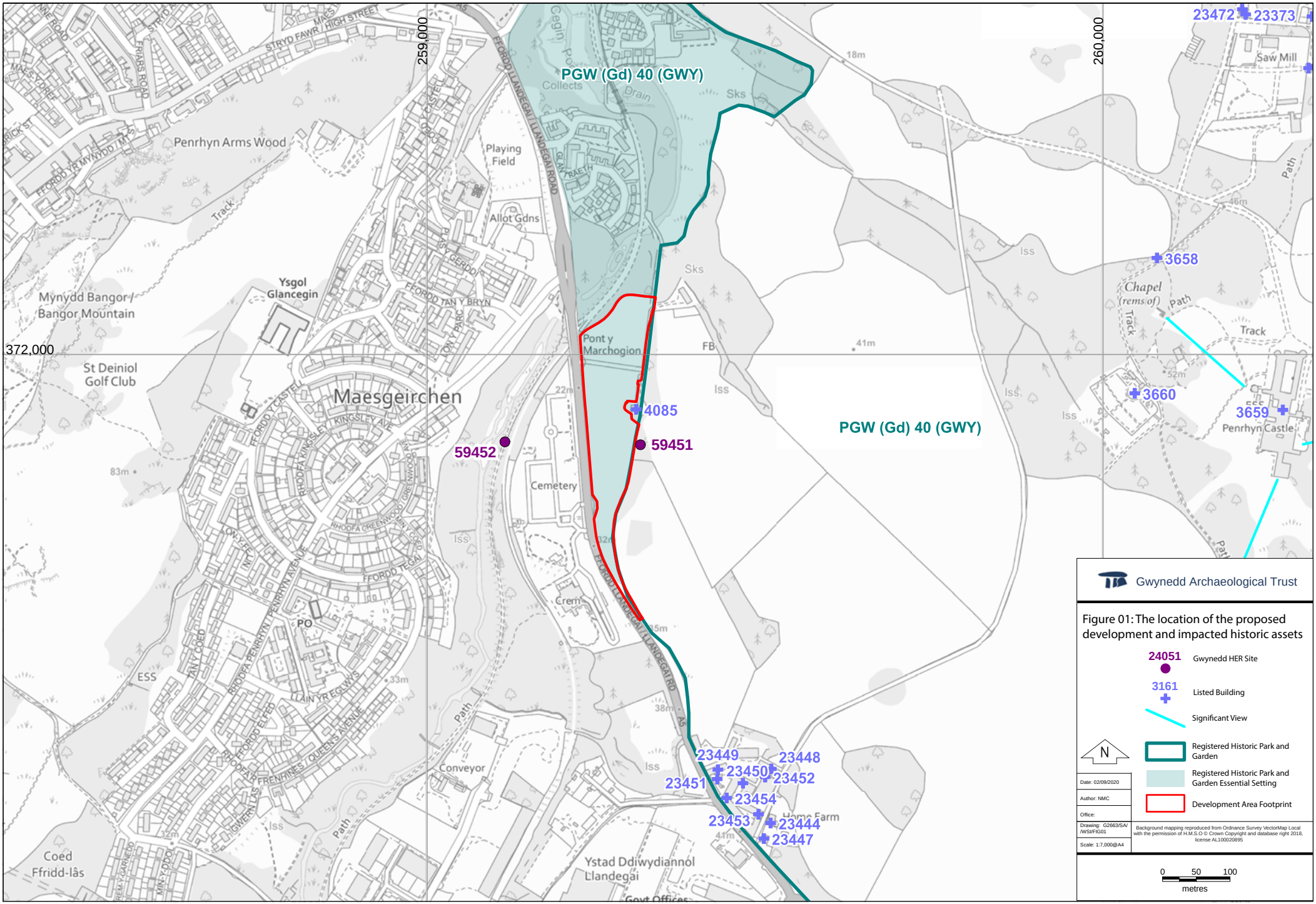
PGW (Gd) 40 (GWY)
PGW (Gd) 40 (GWY)
259,000
260,000
372,000
23472
23373
Saw Mill
3658
3660
3659
Penrhyn Castle
Chapel (rems of)
4085
59451
59452
23449
23448
23450
23452
23451
23454
23453
23444
23447
Penrhyn Arms Wood
Playing Field
Allot Gdns
Ysgol Glancegin
Mynydd Bangor / Bangor Mountain
St Deiniol Golf Club
Maesgeirchen
Pont y Marchogion
Cemetery
Conveyor
Ystad Ddiwydiannol Llandegai
Coed Ffridd-lâs
Gwynedd Archaeological Trust
Figure 01: The location of the proposed development and impacted historic assets
24051
Gwynedd HER Site
3161
Listed Building
Significant View
N
Registered Historic Park and Garden
Registered Historic Park and Garden Essential Setting
Development Area Footprint
Date: 02/09/2020
Author: NMC
Office:
Drawing: G2663/SA/WSI/FIG01
Scale: 1:7,000@A4
Background mapping reproduced from Ordnance Survey VectorMap Local with the permission of H.M.S.O © Crown Copyright and database right 2018, license AL100020895
0 50 100
metres

FIGURE 02

Reproduction of Macbryde Homes Ltd. Drawing No. LRBANG-SL.01

Key:

- Site Boundary
- 1.8m high boundary fence
- 1.8m high screen wall / fence
- Private Drive
- Visibility Splays - 2.4x59m to Site Entrance
- Indicative Landscaping
- Number of parking spaces proposed to Semi-Detached and Detached Dwellings in accordance with Gwynedd's Parking Standards
- Parking space allocation to Frontage Parking Dwellings
- Knee rails to parking bays to Terraced Housetypes
- * Affordable Housing
- Existing retained hedges/landscaping

Rev:	Description:	Date:
A:	General mix & layout amends.	18/03/20
B:	Pump Station added	09/06/20
C:	Additional Unit added	12/06/20
D:	-	12/08/20

SCHEDULE OF ACCOMMODATION

HOUSETYPE	DESCRIPTION	SQFT	NUMBER	PERCENTAGE
AF38 - (Affordable)	2 Bed, 2 Storey Mid-End-Terrace	665 SQFT	7	10.61
SF38 - (Affordable)	2 Bed, 2 Storey End-Terrace	999 SQFT	6	9.09
Oakley	2 Bed, 2 Storey Mid-Terrace	705 SQFT	7	10.61
Highfield	3 Bed, 2 Storey End-Terrace	822 SQFT	9	13.12
Marlow	3 Bed, 2 Storey	979 SQFT	7	10.61
Stratford	3 Bed, 2 Storey	1065 SQFT	10	15.15
Evesham	3 Bed, 2 Storey	1130 SQFT	5	7.58
Avebury	4 Bed, 2 Storey	1245 SQFT	6	9.09
Canterbury	4 Bed, 2 Storey	1332 SQFT	7	10.61
Salisbury	4 Bed, 2 Storey	1570 SQFT	3	4.55
TOTAL		49332 SQFT	66	

Gross Site Area	6.19 Acres	2.51	Hectares
POS	1.47 Acres	0.59	Hectares
Undevelopable: SSR, Cottages Access Route, Pump Station	0.13 Acres	0.05	Hectares
NETT SITE AREA:	4.59 ACRES	1.84	HECTARES
Gross Density	10.66 Units/Acre	26.35	Units/Hectare
NETT DENSITY:	14.38 UNITS/ACRE	36.63	UNITS/HECTARE
Gross Footage	11021.32 SQFT/Acre	2530.12	SQM/Hectare
NETT FOOTAGE:	74883.55 SQFT/ACRE	3412.66	SQM/HECTARE

MACBRYDE HOMES

Macbryde Homes Limited,
Macbryde House, Unit 28,
St. Asaph Business Park,
Ffordd Richard Davies, St Asaph,
Denbighshire. LL17 0LJ.
Tel. 01745 536677
Fax. 01745 536688

Site:
Llandegai Road, Bangor

Title:
Site Layout

Scale:
1:500@A0

Date:
03/03/2020

Ref:
LRBANG-SL.01

Rev:
D

APPENDIX II

Sites listed on Gwynedd Archaeological Trust Historic Environment Record

Sites on the Gwynedd HER within 500m of the centre of the study area					
PRN	**SITE_NAME**	**PERIOD**	**TYPE**	**Listed Building Reference**	**NGR**
65568	A5 Bridge, Penrhyn Quarry Railway	POST MEDIEVAL	BRIDGE		SH 59218 72037
65569	Bridge, Penrhyn Quarry Railway	POST MEDIEVAL	BRIDGE		SH 5931 7218
2812	Bronze Palstave, Findspot, Maesgirchen	BRONZE AGE	FINDSPOT		SH592715
56125	Building, S of Plas y Coed	POST MEDIEVAL	BUILDING		SH5934472437
56126	Building, SE of Plas y Coed	POST MEDIEVAL	BUILDING		SH5950772344
12143	Cegin Viaduct, Penrhyn Estate, Bangor	POST MEDIEVAL	VIADUCT		SH59267239
24769	Enclosure, Penrhyn Park	UNKNOWN	ENCLOSURE		SH5962072040
24770	Enclosure, Penrhyn Park	UNKNOWN	ENCLOSURE		SH5966071750
65552	Formation, Marchogion Inclined Plane	POST MEDIEVAL	INCLINED PLANE		SH 59309 71919
29465	Former Penrhyn Quarry Railway, Bangor	POST MEDIEVAL	RAILWAY		SH59107153
64225	Former Stables at Plas y Coed	POST MEDIEVAL	STABLE	Grade II 23371	SH5936372469
24862	Incline Cottage, Bangor	POST MEDIEVAL	COTTAGE;WINDER HOUSE	Grade II 4085	SH5930771924
60878	Maesgeirchen Estate, Bangor	MODERN	HOUSING ESTATE		SH58907182
65551	Marchogion Inclined Plane, Penrhyn Quarry Railroad	POST MEDIEVAL	INCLINED PLANE		SH 5933 7205
64249	Plas y Coed	POST MEDIEVAL	HOUSE	Grade II 23370	SH5938972472
65555	Pont Marchogion, Penrhyn Quarry Railroad	POST MEDIEVAL	BRIDGE		SH 5933 7219
5679	Pont Marchogion, Port Penrhyn	POST MEDIEVAL	BRIDGE	Grade II 4084	SH5927072400
56218	Railway Embankment, S of Crematorium	POST MEDIEVAL	RAILWAY EMBANKMENT		SH5921271507
65553	Shelter, Marchogion Inclined Plane	POST MEDIEVAL	SHELTER		SH 5933 7214
65554	Shelter, Marchogion Inclined Plane	POST MEDIEVAL	SHELTER		SH 5934 7213
56124	Tan-y-bryn Lodge, Bangor	POST MEDIEVAL	LODGE	Grade II 4086	SH5911072424

APPENDIX III

Definition of Mitigation Terms

Definition of field evaluation techniques

Field evaluation is necessary to fully understand and assess most class E sites and to allow the evaluation of areas of land where there are no visible features but for which there is potential for sites to exist. Two principal techniques can be used for carrying out the evaluation: geophysical survey and trial trenching. Topographic survey may also be employed where sites are thought to survive as earthworks.

Geophysical survey most often involves the use of a magnetometer, which allows detection of some underground features, depending on their composition and the nature of the subsoil. Other forms of geophysical survey, including resistivity survey and ground penetrating radar might also be of use.

Trial trenching allows a representative sample of the development area to be investigated at depth. Trenches of appropriate size can also be excavated to evaluate category E sites. Trenching is typically carried out with trenches of between 20 to 30m length and 2m width. The topsoil is removed by machine and the resulting surface is cleaned by hand, recording features. Depending on the stratigraphy encountered the machine may be used to remove stratigraphy to deeper levels.

Definition of Mitigatory Recommendations

Below are the measures that may be recommended to mitigate the impact of the development on the archaeology.

None:
No impact so no requirement for mitigatory measures.

Detailed recording:

This requires a full photographic record and measured survey prior to commencement of works.

Archaeological excavation may also be required depending on the particular feature and the extent and effect of the impact.

Basic recording:
Requiring a photographic record and full description prior to commencement of works.

Strip, Map and Sample:
The technique of Strip, Map and Sample involves the examination of machine-stripped surfaces to identify archaeological remains. The stripping is undertaken under the supervision of an archaeologist. Stripping and removal of the overburden is undertaken in such as manner as to ensure damage does not take place to surfaces that have already been stripped, nor to archaeological surfaces that have not yet been revealed.

Stripping is undertaken in as careful a manner as possible, to allow for good identification of archaeological features. A small team of archaeologists will be responsible for subsequently further cleaning defined areas where necessary. Complex sites which cannot be avoided will need to be fully excavated.

Watching brief:
This is a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons. This will be within a specified area or site on land, inter-tidal zone or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive.

Avoidance:
Features, which may be affected directly by the scheme, or during the construction, should be avoided. Occasionally a minor change to the proposed plan is recommended, but more usually it refers to the need for care to be taken during construction to avoid accidental damage to a feature. This is often best achieved by clearly marking features prior to the start of work.

Reinstatement:
The feature should be re-instated with archaeological advice and supervision.

APPENDIX IV

Photographic Metadata - Walkover Survey

PHOTO RECORD NUMBER	PROJECT PHASE	DESCRIPTION	CONTEXT NUMBER (S)	VIEW FROM	SCALE(S)	CREATOR OF DIGITAL PHOTO	DATE OF CREATION OF DIGITAL PHOTO	ORIGINATING ORGANISATION	PLATES
G2663_001	assessment/evaluation	General view along the access track to Incline Cottage (RE car in view)	n/a	W	1x1m	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	
G2663_002	assessment/evaluation	General view along the access from the former tramway	n/a	E	1x1m	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	01
G2663_003	assessment/evaluation	View of Penrhyn Park boundary wall with lane to Nursery Cottage	n/a	E	1x1m	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	21
G2663_004	assessment/evaluation	View of Penrhyn Park boundary wall with lane to Nursery Cottage, in the NE corner of the site beyond the lane	n/a	E	1x1m	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	19
G2663_005	assessment/evaluation	View of 'Penrhyn' slate fencing in the NE corner of the site and tranway route in a cutting beyond	n/a	S	1x1m	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	14
G2663_006	assessment/evaluation	General view of south-north sloping field	n/a	NE	not used	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	
G2663_007	assessment/evaluation	General view of south-north sloping field	n/a	NE	not used	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	
G2663_008	assessment/evaluation	General view of the sloping northern end of the field	n/a	ESE	not used	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	12

PHOTO RECORD NUMBER	PROJECT PHASE	DESCRIPTION	CONTEXT NUMBER (S)	VIEW FROM	SCALE(S)	CREATOR OF DIGITAL PHOTO	DATE OF CREATION OF DIGITAL PHOTO	ORIGINATING ORGANISATION	PLATES
G2663_009	assessment/evaluation	General view of the study area	n/a	S	not used	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	
G2663_010	assessment/evaluation	General view of the study area	n/a	SW	not used	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	22
G2663_011	assessment/evaluation	General view of the southern part of the study area	n/a	NE	not used	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	
G2663_012	assessment/evaluation	View of Incline cottage	n/a	NE	not used	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	05
G2663_013	assessment/evaluation	View along the lane that leads to Nursery Cottage, and Penrhyn Estate boundary wall	n/a	S	1x1m	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	13
G2663_014	assessment/evaluation	View of Incline Cottage from the access trackway	n/a	NNW	not used	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	16
G2663_015	assessment/evaluation	View of Incline Cottage showing the associated 'D' shaped garden to the west	n/a	SW	not used	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	06
G2663_016	assessment/evaluation	General view of southern narrow tip of the study area with the Penrhyn Estate wall to the west	n/a	N	1x1m	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	03
G2663_017	assessment/evaluation	Elevation view of the Penrhyn Demesne boundary wall	n/a	E	1x1m	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	04

PHOTO RECORD NUMBER	PROJECT PHASE	DESCRIPTION	CONTEXT NUMBER (S)	VIEW FROM	SCALE(S)	CREATOR OF DIGITAL PHOTO	DATE OF CREATION OF DIGITAL PHOTO	ORIGINATING ORGANISATION	PLATES
G2663_018	assessment/evaluation	General view of an Iron Gate and opening into the Penrhyn demesne through the estate boundary wall	n/a	S	1x1m	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	08
G2663_019	assessment/evaluation	Detail of the Iron gate	n/a	SW	1x1m	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	
G2663_020	assessment/evaluation	General view along the narrow tail of the site from the southernmost point	n/a	SSE	not used	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	
G2663_021	assessment/evaluation	View of rough stone revetted embankment on the west side of the site; the A5 road	n/a	SE	1x1m	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	02
G2663_022	assessment/evaluation	Angled view of Iron gate opening showing railings [Feature 1]	n/a	NW	1x1m	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	07
G2663_023	assessment/evaluation	General view across the field showing the Penrhyn park boundary wall	n/a	SW	not used	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	18
G2663_024	assessment/evaluation	General view across the field showing the rising ground	n/a	S	not used	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	10
G2663_025	assessment/evaluation	View of damage to Penrhyn Park boundary wall	n/a	W	1x1m	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	17

PHOTO RECORD NUMBER	PROJECT PHASE	DESCRIPTION	CONTEXT NUMBER (S)	VIEW FROM	SCALE(S)	CREATOR OF DIGITAL PHOTO	DATE OF CREATION OF DIGITAL PHOTO	ORIGINATING ORGANISATION	PLATES
G2663_026	assessment/evaluation	General view of study area showing incline cottage through the trees to the right	n/a	S	not used	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	20
G2663_027	assessment/evaluation	View of slate animal drinking trough [Feature 3]	n/a	E	1x1m	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	09
G2663_028	assessment/evaluation	View of slate trough [Feature 3] with Penrhyn Estate wall behind	n/a	W	1x1m	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	
G2663_029	assessment/evaluation	General view of Field showing Incline cottage	n/a	W	not used	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	23
G2663_030	assessment/evaluation	General view of low-lying boggy part of the field immediately south of the entrance trackway	n/a	N	1x1m	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	11
G2663_031	assessment/evaluation	General view of route of tramway and Penrhyn Estate wall beyond	n/a	SSW	not used	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	
G2663_032	assessment/evaluation	View of overgrown tramway route	n/a	N	not used	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	
G2663_033	assessment/evaluation	View of break in Penrhyn estate wall where lane turns towards Nursery Cottage	n/a	SE	not used	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	

PHOTO RECORD NUMBER	PROJECT PHASE	DESCRIPTION	CONTEXT NUMBER (S)	VIEW FROM	SCALE(S)	CREATOR OF DIGITAL PHOTO	DATE OF CREATION OF DIGITAL PHOTO	ORIGINATING ORGANISATION	PLATES
G2663_034	assessment/evaluation	Close up shot nshowing the former tramway in the cutting to the north of the study area	n/a	S	not used	Robert Evans	10/09/2020	Gwynedd Archaeological Trust	15

Gwynedd Archaeological Trust
Ymddiriedolaeth Archaeolegol Gwynedd

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