

HARLECH, GWYNEDD

ASESIAD ARCHEOLEGOL & AROLWG GEOFFISEGOL / ARCHAEOLOGICAL ASSESSMENT & GEOPHYSICAL SURVEY



Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

HARLECH, GWYNEDD

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Ymddiriedolaeth Archaeolegol Gwynedd
Craig Beuno, Ffordd y Garth,
Bangor, Gwynedd, LL57 2RT

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Cadeiryddes/Chair - Yr Athro/David Elis-Williams MA(Oxon), MSc, CPFA
Prif Archaeolegydd/Chief Archaeologist - Andrew Davidson, B.A., MCIfA

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CRYNHODEB ANHECHNEGOL

Comisiynwyd Ymddiriedolaeth Archeolegol Gwynedd gan William Homes (Bala) Cyf. i gynnal asesiad archeolegol i gefnogi cais cynllunio arfaethedig ar gyfer datblygiad preswyl ar dir i ffwrdd ar ffordd yr A496 yn Harlech, Gwynedd. Mae'r ardal arfaethedig ar hyn o bryd yn faes o dir pori lledlw. Nid oes asedau archeolegol hysbys o fewn cyfyngder yr ardal ddatblygiadol, gyda'r ardal o'i chwmpas yn cael ei nodweddu gan systemau caeau ôl-ganoloesol, sianeli draenio ac anheddiad modern. Nid oedd arolwg geoffisegol a gwblhawyd fel rhan o'r asesiad yn nodi unrhyw anghysonderau sy'n nodi gweithgarwch archeolegol. Mae wal gerrig sych ac arglawdd llifogydd wedi'u lleoli o fewn yr ardal ddatblygu ac argymhellir, os yw'r rhain i'w heffeithio yna mae cofnod yn cael ei gwblhau cyn y gwaith adeiladu, gyda chofnod pellach wedi'i gwblhau o'r arglawdd yn ystod gwaith.

NON-TECHNICAL SUMMARY

Gwynedd Archaeological Trust was commissioned by William Homes (Bala) Ltd. to undertake an archaeological assessment in support of a proposed planning application for residential development on land to off the A496 road in Harlech, Gwynedd. The proposed area is currently a field of semi-improved pasture. There are no known archaeological assets within the confines of the development area, with the surrounding area characterised by post-medieval field systems, drainage channels and modern settlement. A geophysical survey completed as part of the assessment did not identify any anomalies indicating archaeological activity. A drystone wall and flood embankment are located within the development area and it is recommended that if these are to be affected then a record is completed prior to construction, with a further record completed of the embankment during works.

1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) was commissioned by William Homes (Bala) Ltd. to undertake an archaeological assessment and geophysical survey in advance of a proposed residential development on land off the A496 road in Harlech, Gwynedd LL46 2NZ (NGR SH58233200; Figure 01). The assessment and geophysical survey were undertaken in support of a planning application for 24No houses along with internal access, parking landscaping and drainage. The proposed development area measures 0.82ha and incorporates a field of semi-improved pasture.

The archaeological assessment and geophysical survey were undertaken in a staged manner:

- The geophysical survey was conducted in December 2022 by *360° Archaeology* on the behalf of GAT (a copy of the report is attached in Appendix II).
- The archaeological assessment was undertaken between February and March 2023, the results of which are outlined in this report.

The assessment and geophysical survey will be undertaken between February and March 2023, and will conform to the following guidelines:

- Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs) Version 2 (The Welsh Archaeological Trusts, 2022);
- 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, 2020);
- Standard and Guidance for historic environment desk-based assessment (Chartered Institute for Archaeologists, 2020);
- Standard and Guidance for The Collection, Documentation, Conservation and Research of Archaeological Materials (Chartered Institute for Archaeologists, 2020); and

- Standard and Guidance for The Creation, Compilation, Transfer and Deposition of Archaeological Archives (Chartered Institute for Archaeologists, 2020).

The archaeological mitigation was undertaken in accordance with an approved Written Scheme of Investigation (WSI) (Appendix I). In line with the Gwynedd Historic Environment Record (HER) requirements, the HER was contacted at the onset of the project and HER Enquiry Number GATHER1763 and the Event PRN 46516 were assigned.

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.

1.1 Aims & Objectives

The aims and objectives were to provide:

- a detailed breakdown of the known archaeology in the vicinity of the site;
- an assessment of previous land use compiled from an analysis of historical maps, aerial photographs and other archive materials;
- a listing of the heritage-related planning constraints that may affect the site;
- a ranking of the potential for archaeology of each of the archaeological periods to be found within the site; and
- understand the archaeological potential of the development site and allow for a better-informed planning recommendation through the application of a geophysical survey.
- provide recommendations, if necessary, for future intrusive survey and construction excavation activities on site (requirements that would need to be in place during these or similar activities).

1.2 Acknowledgements

GAT would like to thank the following for their contribution and support:

- *Client:* (William Homes (Bala) Ltd): Penny Lofts.
- *Gwynedd Archaeological Planning Services:* Jenny Emmett & Tom Fildes.
- *GAT Project Team:* John Roberts, Robert Evans & Stuart Reilly.

2 METHODOLOGY

2.1 Introduction

This assessment compromised a desk-based study and field survey and the following:

- a detailed breakdown of the known archaeology in the vicinity of the site;
- an assessment of previous land use compiled from an analysis of historical maps, aerial photographs and other archive materials;
- a listing of the heritage-related planning constraints that may affect the site;
- a ranking of the potential for archaeology of each of the archaeological periods to be found within the site; and
- provide recommendations for future intrusive survey and construction excavation activities on site (requirements that would need to be in place during these or similar activities).

2.2 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” (ClfA 2020, 4).

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

- The regional Historic Environment Register ((HER) Gwynedd Archaeological Trust, Craig Beuno, Ffordd y Garth, Bangor, Gwynedd LL57 2RT) was examined for information concerning the mitigation area, defined as land off the A496 road in Harlech as detailed in Figure 01. Examination of the core HER was undertaken, including the 25-inch County Series Ordnance Survey maps ([Merionethshire County Series Sheets XVIII.16 and XIX.13](#)) and any secondary information held within the HER. All identified assets have been mapped, described and added to a gazetteer of assets, with their relative importance defined;
- 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;
- 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) were examined for potential features. This included 1940s RAF vertical aerial photographs;
- An online catalogue search of the National Library of Wales (Penglais Rd, Aberystwyth SY23 3BU) was completed;
- Archive data, including primary and secondary sources, historic maps and estate maps will be examined at the regional archives, if open and accessible. Archive data included historic mapping such as the 1841 Llandanwg Parish tithe map and schedule and Mostyn estate maps; and
- Light Detection and Ranging (LiDAR) data was 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 for area SH53.

2.3 Field Survey

A field survey was undertaken on the 28th February 2023 and incorporated the proposed development area, as outlined in Figure 01. Known assets were mapped and located in advance and the aim of the field survey was to visit and record these features and to identify any additional features; information was recorded on GAT pro-formas and a photographic record maintained. Photographic images were taken in RAW format using a digital SLR set to maximum resolution (Nikon D3000; resolution: 3872 x 2592 [11 effective megapixels]) and archived in TIFF format; a total of 33 images were taken (G2759_001 to G2759_033; cf. [Appendix II](#)).

The field survey area consisted of a trapezoidal shaped development plot immediately north and east of housing developments of 1960's to 1980's date on the northern edge of lower Harlech. The plot comprised improved grassland, with a very sandy silt topsoil. It was bordered to the west by a 0.6m high drystone wall (Asset 1; cf. Plate 07), with a post and wire fence running adjacent to the road pavement; to the south the plot is bounded by a footpath and post and wire fence that runs adjacent to the Pant yr Eithin housing estate. In the southwest corner of the field the route of below ground services has been surveyed in and is marked out with wooden pegs (Plates 1, 2 & 6) with manhole covers and associated infrastructure visible at surface level (Plates 8 & 9), along with overhead 11kV lines. The eastern edge of the development plot is bounded by a sandy silt embankment, about 10 m wide and 0.6 m high with a shallow profile (Asset 2; Plates 4, 5 & 12). This was interpreted as a former field boundary and flood defence, likely established after low lying land was reclaimed during the late medieval/post medieval period; the embankment is now considerably eroded and collapsed, helped by damage caused by livestock. The embankment appears spread out at the base, suggesting that it was once narrower and taller prior to this collapse. It is shown on the 1st edition Ordnance Survey Merionethshire County Series 25-inch to 1-mile Map Sheets XVIII.16 and XIX.13 (published 1889). The north and east sides of the development plot are open, as the large field extends all the way to the railway line to the southeast and the plot is not as yet enclosed. Patches of gorse were noted, particularly along the southern and western boundaries of the site, and along the embankment. The field had some undulations within it, particularly to the northern end of the plot, but these are thought to have been eroded windblown sand that has become consolidated, rather than any archaeological feature. To the northeast outside the development plot are the remains of a former stock enclosure, now only 0.25 m high, surviving as two or three courses of grey industrial brickwork (Plate 11). This is shown on the Ordnance Survey 1:10,000 map (Figure 01). The main road carriageway is on a slight

embankment above the field level (Plate 14). A public footpath running southeast to northwest crosses the open field that contains the development plot (Plate 21).

The local area was characterised by extensive low lying land with a fairly uniform character, with higher ground around Coed Llechwedd to the southeast (Plates 24 & 25).

Further field subdivisions are shown on the historic mapping that cannot be seen on the ground now. The only historic boundary clearly identified clearly is the drystone wall to the west, which was clearly built as a road boundary wall, probably in the 19th century (Asset 1) but could be earlier. The embankment (Asset 2) is of an unknown date but would appear to have been constructed in the way it has as a flood defence. Apart from the very modern stock enclosure to the north no other archaeological features were identified. The field appears to be part of the land that was reclaimed here since medieval times and to have formed part of the enclosures/allotments shown on the allotment map of 1810 (Figure 04) and the Llandanwg Parish tithe map (Figure 06). The boundaries, very regular in layout, reflect the allotments shown on the 1810 map and suggest a very organized set-up. Some of them have been subsequently lost, including in the study area, between 1st and 2nd edition Ordnance Survey Merionethshire County Series 25-inch to 1-mile map (Sheets XVIII.16 and XIX.13 published 1889 & 1901 respectively; cf. Figures 07 & 08). This is presumably because the area became used as an agricultural field rather than used for small allotment plots.

2.4 Data Management Plan

Archiving was completed based on the following task list:

- Pro-formas: all cross referenced and scanned for digital archiving; photographic Metadata: cross-referenced with all pro-formas and completed in Microsoft Excel.

This data was then used as the basis for the physical and digital dataset archives; information from these were then used to compile the project report. The physical archive is stored in a designated project folder and the location confirmed in the Trust project database; the digital dataset is stored on a dedicated Trust server, with the location confirmed in the Trust project database via a specific hyperlink. External datasets for the Historic Environment Record (HER) and Royal Commission on Ancient and Historic Monuments Wales (RCAHMW) are as defined in the dissemination strategy below. There is no de-selected digital data. The following dissemination and archiving of the report and digital dataset has been applied:

- A digital report has been provided to the client and Gwynedd Archaeological Planning Service (GAPS) (draft report then final report);
- A digital report has been provided to the regional HER, along with a digital dataset comprising an Event Primary Reference Number (PRN) summary. The report and dataset will be submitted in accordance with the required standards set out in Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs) (Version 2); and
- A digital report and digital archive dataset has been prepared for submission to the RCAHMW (final report only), in accordance with the RCAHMW Guidelines for Digital Archives Version 1. The dataset has been prepared in the format required by RCAHMW and includes:
 - o Photographic metadata (Microsoft Access);
 - o Photographic archive (TIFF format);
 - o Project Information form (Excel);
 - o File Information form (Excel) – Microsoft Word report text final;
 - o File Information form (Excel) – Photographic metadata (general);
 - o File Information form (Excel) – Adobe PDF report final; and
 - o File Information form (Excel) - Photographic metadata (detail).

2.5 Gazetteer of Assets

A gazetteer has been compiled for any existing and newly identified assets, based on information sourced from the desk-based assessment and field survey.

The gazetteer has been prepared in the following format:

Asset Number	
Site name	
PRN number	
Grid reference	
Period	
Site type	
Designation	
Assessment category	
Description	
Impact	
Recommendation	

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.

3 RESULTS

3.1 Geophysical Survey

The geophysical survey was undertaken on the 5th and 6th December 2022 by 360° Archaeology with a SENSYS MAGNETO MX PDA 5 channel survey platform was used for the detailed area gradiometer survey. The platform was GPS enabled using a mounted Trimble R12 antenna and hosted five FGM650/3 sensors spaced 0.5m apart.

The magnetometry survey results did not identify probable or possible archaeological anomalies but the results were dominated by bipolar linear anomalies likely to be associated with metallic service pipes that were concentrated along the southern, northern, and eastern boundary of the field. High value dipolar spikes were also present that are likely to originate from buried ferrous metal or burned material, along with weaker spreads of magnetic disturbance. The magnetic enhancements could be archaeological when associated with known anthropogenic features (for example, vegetation removal, groundwater abstraction), however given the lack of context to any known archaeology it is unclear if these anomalies have any relevance.

A copy of the geophysical survey is attached in [Appendix V](#).

3.2 Desk Based Assessment

3.2.1 Location and geological summary

The proposed development site is located on land off the A496 road, on the edge of Lower Harlech. The site is bounded to the west by the A496 and is set within flat open pastureland.

The underlying geology of the survey area comprises Harlech Grits Group – Sandstone, siltstone and mudstone. This is a Sedimentary bedrock formed between 526 and 499 million years ago during the Cambrian period. The superficial deposits comprise Blown Sand, sedimentary deposits formed between 2,588 million years ago during the Quaternary Period and the present (British Geological Survey: 2022). Soils consist of naturally wet, very acid sandy and loamy soils (Source: Cranfield Soil and Agrifood Institute/Soilscapes).

3.2.2 Statutory and Non-Statutory Designations

There are no known statutory or non-statutory designated assets within the proposed development site, but the site is part of the wider agricultural, defensive and settlement multiperiod landscape that includes medieval and post-medieval activity. There are nine statutory and non-statutory designated assets within the assessment area that comprises the development site and a 500m buffer (cf. Figure 03 and Appendix III).

The known statutory and non-statutory designated assets are detailed on Figure 03, and include:

3.2.2.1 Historic Landscape Character Areas

The proposed development is located within the Ardudwy Historic Landscape Character (HLC) Area, which was originally defined in Report GAT_473. Ardudwy is situated in the modern county of Gwynedd, and the historic county of Meirionnydd. It extends from the vale of Ffestiniog (Afon Dwyryd) in the north to near Barmouth in the south, and from the tops of the Rhinogau mountains in the east down to the coast in the west. The area includes a variety of different terrains and habitats, and of different historic landscape types, such as open mountain tops, heavily wooded valley sides, low-grade agricultural land, small villages and beaches. It is known for its wealth of extensive relict archaeological remains, mainly dating from the late prehistoric period and the World Heritage Site of Harlech; there are also two registered parks and gardens, Cors y Gedol and Glyn-Cywarch.

The proposed development is located on the boundary of two areas within this HLC:

- Area 24 Harlech (PRN 18257) encompasses the 13th century castle and town of Harlech, that occupy a promontory with views over Tremadoc Bay and across the Llyn Peninsula. Both were conceived as part of the chain of castle-boroughs intended to encircle North Wales by Edward I. Construction began in 1283 with the castle being largely complete by 1289 and the new royal borough received its charter in 1284. The associated town proved to be the smallest of the Edwardian planned boroughs with a maximum burgage total of 29 in 1312 that suggests a community population of 150 persons. The town, while it had a small population did have commercial and administrative functions as the hundred court and the county sessions met here. There were also weekly markets and four annual fairs. Harlech was attacked and the town largely destroyed by Owain Glyndwr in 1404. There is limited evidence for the presence of a medieval church within the town and a mill, mentioned in 1305 purportedly located beyond the northeast corner of the castle. The town struggled to recover from Glyndwr's attack and subsequent occupation, Harlech declined during the later Middle Ages as its military function became superfluous, although it retained some administrative status. Aside from the castle there are no upstanding buildings of medieval origin within the town, rather the majority are of 18th and 19th century date.
- Area 30 Morfa Harlech – Fieldscape (PRN 18263) is an area of reclaimed marshland which is currently agricultural in nature. It is characterised by a regular pattern of fields, defined mainly by cut drainage features (some with hedges alongside) and/or earthen banks. The associated farmsteads are of 19th or early 20th century date and are set off the Porthmadog to Barmouth road, A496. At the time of the construction of Harlech castle and establishment of the accompanying town at the end of the 13th century, they were positioned on a rocky promontory above the sea. During the following centuries the area below the town silted up and became marshland. Part of Morfa Harlech was enclosed and drained by the Glyn Cywarch estate in 1789. After this land reclamation the main Porthmadog to Barmouth road was diverted from its original route at the bottom of the coastal hill slopes and now crosses the morfa in a virtual straight line, after first cutting across the northern end of the area to link up with the previously isolated settlement of Ynys. At the same time the Cambrian Railway was established, and farmsteads started to populate the area. During the 20th century the Forestry Commission planted conifers in a large area behind the sand

dunes, Royal St David's Golf Course (PRN 35135) was opened in 1894 and the town of Harlech encroached on the southern part of the area.

The proposed development is located at the northern edge of Area 24, along side the A496 and adjacent to the estate of Bron yr Hwylfa, which is part of Lower Harlech. The track of land is currently a field of pasture and is part of the Fieldscape of Area 30, Morfa Harlech. The proposed 24No houses while a relatively small development, that is flanked by existing houses to the south and west, which should blend in with the immediate surroundings will nonetheless change the boundary between these two distinct areas. The proposed development area is currently part of a rural setting but it will become part of the urban zone of Harlech. On this basis, the boundary between Areas 24 and 30 will need to be amended to reflect the limited change of landscape character and the gradual, continued extension of the town along the route of the A496.

The proposed residential development is positioned outside of the essential setting of the World Heritage site of Harlech Castle, which corresponds with the edge of Area 24 and is not within a significant view of the castle. Cadw have stated that the development will not have any effect on the way that the castle and World Heritage Site are experienced, understood and appreciated and that consequently, the proposed development will have no impact on the setting of scheduled monument ME044 (Harlech Castle) or the outstanding universal values of the World Heritage Site (correspondence dated: 8 December 2022). The proposed development is also located outside of the historic core (conservation area) of the town of Harlech. Given the prominent position of Harlech castle on a promontory, the monument is visible from the site.

3.2.2.2 Scheduled Monuments

There are no scheduled monuments within the development area or 500m assessment buffer zone but Harlech Caste (Scheduled Monument ME044) is located c.550m to the south.

3.2.2.3 Conservation Areas

There are no conservation areas within the development area or 500m assessment buffer zone but there is one conservation area located c.571m to the south, incorporating the castle and environs as far south as Coleg Harlech:

- PRN 62467, NGR SH5803430997: Harlech, Conservation Area, Multiperiod Landscape, Conservation Area Harlech.

3.2.2.4 Registered Historic Parks and Gardens

There are no Registered Historic Parks and Gardens within the development area or 500m assessment buffer zone but there are two Registered Historic Parks and Gardens within the wider area:

- PRN 17283, NGR SH60663392: Glyn Cywarch, Registered Parks And Gardens PGW(Gd)28(GWY).
- PRN 18242 NGR SH59802250 Cors y Gedol, Registered Parks And Gardens PGW(Gd)27(GWY).

3.2.2.5 Listed Buildings Grade II*

There are no Grade II* Listed Building within the 500m assessment buffer zone.

3.2.2.6 Listed Buildings Grade II

There are two Grade II Listed Buildings within the 500m assessment buffer zone but outside the proposed development area:

- PRN 63903, NGR SH5834531682: a late 18th century or early 19th century barn south of Ael-y-Glyn. Listed Building 25517. Located c.150m southeast of the development area.

- PRN 63903, NGR SH5833431678: a late 18th century or early 19th century cow house south of Ael-y-Glyn. Listed Building 25518. Located c.150m southeast of the development area.

3.2.2.7 Non-Statutory Designated Assets

There are nine non-statutory designated assets within the 500m assessment buffer zone:

- PRN 57448, NGR SH5824931392: A post medieval building east of Tan-y-Coed. Located c. 280m to the southeast.
- PRN 57445, NGR SH5882431705: Building, N of Cerrig-y-Gwaenydd. Located c.500m to the east.
- PRN 57444, NGR SH5881731685: Building, W of Cerrig-y-Gwaenydd. Located c.500m to the east.
- PRN 69436, NGR SH58823168: Cerig-y-gwaenydd, a post medieval farmstead. Located c.500m to the east.
- PRN 59754, NGR SH58263150: A stone-lined drainage ditch or culvert, flowing northeastwards, approximately 1.2 metres wide. It is possible that this represents the course of the channel which once gave ships access to Harlech. Located c. 390m to the south.
- PRN 67050, NGR SH5802431711: Ffordd Morfa, Harlech, Urban Character Area. Located to the immediate south and east.
- PRN 57446, NGR SH5873931601: Glan-gors, a post-medieval building southwest of Cerrig-y-Gwaenydd. Located c.473m to the southeast.
- PRN 67051, NGR SH5860331595: Llechwedd, Harlech, Urban Character Area. Located c.369m to the southeast.
- PRN 57447, NGR SH5865931514: Nant-y-tylcau, a post-medieval farmstead located northwest of Bron Meini. Located c.479m to the southeast.

3.3 Historical and Archaeological Background

3.3.1 Prehistoric and Roman

The local area is characterised by findspots from both periods, with a preponderance for artefacts from the Bronze Age (2300 – 800 BC).

Prehistoric and Roman sites included:

- PRN 2896, findspot, near Harlech Castle of a gold torc dated from the Middle Bronze Age, was found in a garden near the castle in 1692.
- PRN 2906, findspot of a hoard of Bronze Age palstaves found near Harlech in 1851, one of which resides in the British Museum.
- PRN 2910, findspot of an urn with 3rd and 4th century Roman coins was found c. 1695 at Harlech Castle. An additional Roman coin dated 388-402 was found during clearance work at the castle in the 1920's or 1930's.
- PRN 3911, findspot of a bronze rapier preserved in the Ashmolean Museum at Oxford is recorded as having been found at Harlech.
- PRN 3915, bronze mirror and platter found in close association c.1880 close to the roadside (B4573). The association of artefact types suggests a funerary context.
- PRN 4298, Cairn, Cae'r Garnedd-Foel. This was reported by the Royal Commission on Ancient and Historic Monuments as a ruined cairn composed of large and small stones, to which have been added clearances from the field. A more recent visit suggested there was a large clearance cairn in the adjacent field.

3.3.2 *Medieval*

Prior to the establishment of the Edwardian town and castle, there may have been native occupation of the site, as suggested by references to Harlech within the second branch of the Mabinogion, a collection of prose tales that are thought to have been compiled in the late 11th or 12th century. It is known that both free and bond populations were moved to make way for the castle and borough and the initial land grant. The latter were moved to the earlier commotal centre of Ystumgwern. The free settlement, called Towyndresselethe, might have lain on the coast south of Ynys (Davidson, 2009, 6).

Construction of the castle commenced in 1283, as part of Edward I's strategy to consolidate the conquest of Wales, in particular Gwynedd, with a ring of castles that were accompanied by borough towns which were populated by immigrant English burgesses. Construction of the castle was completed by 1289. It is based around the gatehouse, with an inner and outer ward, and an outer moat on the south and east sides. A large outer enclosure reaching down to the level of the Morfa below the castle was subsequently protected by a strong stone wall, and a path was constructed down the side of the rock to the water gate at its foot. This was to ensure the castle could be supplied from the sea if it was besieged, which did occur in 1294 during the revolt of Madog ap Llywelyn. The castle though was taken by Owain Glyndwr in 1404 and held until 1409. The next significant historical event was during the War of the Roses when the castle was held its Welsh constable Dafydd ab Ieuan ab Einion for the Lancastrians until the siege of 1468. During the late Middle Ages and into the Modern era, the castle was used for various municipal and judicial functions, the Merioneth Assizes for example, were held here. As such, the castle was most likely maintained to a certain extent to allow the administrative status to continue. The last military action at Harlech Castle was during the Civil Wars of the 17th century when it was held for the Royalists by Colonel William Owen of Brogyntyn, until it fell to the Parliamentarians in March 1647. The castle remained in Crown ownership and was transferred from the Office of Woods to the Office of Works in 1914 (Davidson, 2009, 6-7).

The accompanying, medieval borough of Harlech, occupied a narrow terrace south and east of the castle. Given the narrow, rocky, uneven topography it is unlikely that the town was ever laid out in regular burgage plots, and there is no evidence it was ever walled. By 1312/13 the Subsidy Roll noted that number of plots had risen to 29¾ and the borough lands to 123 acres, with a further 46 acres added in that year. A new mill was built in 1316/17. Between the early 14th century and the early 15th century Harlech was a small yet successful borough town, with sufficient lands and resources to maintain its status. Court sessions were held within the castle or within the adjacent shire hall, and a chapel lay within the borough

close to the castle. The town was badly affected when it and the castle were taken by Owain Glyndwr, as records suggest some 46 houses were burnt during the final siege, and in 1416/17 the rentable value of the town was set at half its pre-war value. Later in the 15th century the Wars of the Roses would also have had a negative impact on the town and its economy (Davidson, 2009, 7).

3.3.3 *Post-Medieval and Modern*

Harlech remained the county town into the Post-Medieval era and the Quarter Sessions and the Great Sessions continued to be held at Harlech until 1669 and 1674 respectively. The town steadily declined and was commercially surpassed by Bala and Dolgellau. The lack of surviving medieval architecture reinforces the view that, by the end of the Middle Ages, the physical and economic state of the town was relatively low (Davidson, 2009, 8).

During the late 18th and early 19th century there was an increased interest in Wales by visitors as part of the Picturesque tour that included Harlech in its Welsh itinerary. The increase in interest led to improvement in accommodation for visitors, and slowly to an improvement in transport and communication. This along with the Enclosure Act of 1806 which saw the drainage of the remaining areas of open marsh, the dividing up of the common lands between the major estates as well as new roads and improvement of existing roads due to the work of the new turnpike trusts allowed greater access to Harlech. The new roads encouraged development within the town, with more of a focus on the square but in process altered the urban landscape of Harlech. By 1867 a railway line was established across the Morfa to Harlech, with an accompanying train station below the castle. Most of the existing buildings within the Harlech conservation area date from the 19th and early 20th centuries. Of particular influence, in the latter part of the 19th century, was Samuel Holland, a quarry owner and Liberal MP from 1870 who bought and improved many buildings. This included the construction of the Castle Hotel, Bronwen Terrace, Noddfa, Rock Terrace, Gorffwysfa, and the Board School opposite Rock Terrace. Holland's influence was such that the style he introduced became the *de facto* style for Harlech (Davidson, 2009, 9-11).

Expansion of the town in the later 20th century mainly took place on Morfa Harlech below the castle, where there was ample space to develop. Public and private housing has developed in discrete estates since 1945, most of it accessed from the main A496 road (Davidson, 2009, 13).

3.3.4 Cartographic Evidence and History of Land Ownership

The Mostyn Estate Map MSS 8679 (Bangor Archives), described as *Lands in parish of Llandanwg and Harlech Town by R. Williams* dated 1771 shows the local area pre-enclosure act and listed as 'MARSH'. The Mostyn Estate map MSS 8605 (Bangor Archives) described as *Map and Survey of Harlech Marsh in the Parish of Llandanwg and Llanfihangel y Traethu in the County of Meirioneth* dated 1810 shows area after the Enclosure Act of 1806, with the proposed development area included within plot 16 and visible close to a road, with open ground beyond to the east (cf. Figure 04). The map demonstrates that an embankment [Asset 2] is present by that date, which separates the development area from the more open land beyond; the embankment is depicted as a thicker line on the map and it is likely to have formed a flood bank. Plot 16 is listed in the associated apportionment as belonging to Sir Thomas Mostyn. The *Map and Survey of the Low Lands on the South Side of Rhos Rhigor River in the Parishes of Llandanwg and Llanfihangel y Traethu* (Gwynedd Archives ref. ZXP/9/33) published c.1820 (cf. Figure 05), shows the development area as plot M12. the surrounding land to the south is sub-divided and annotated as being in the hands of C. Ansel Esq., although they may well be the occupier and not the landowner. The purpose of this map was to show a drainage scheme and it ably demonstrates the extensive land reclamation undertaken during this part of the nineteenth century after the enclosure act. The Llandanwg Parish tithe map, published in 1841 (cf. Figure 06), shows the development site within a trapezoidal shaped field, which is listed in the tithe apportionment as plot 110 and named as "Allotment" being kept as pasture as part of Red Lion farm. The field was occupied by a James Anwyl and owned by the Honourable Edward Mostyn Lloyd Mostyn. There seems to be limited change in the field patterns between the late-nineteenth/early twentieth century Merionethshire County Series 25-inch maps (Sheets XVIII.16 and XIX.13). The First and Second Edition Ordnance Survey maps, published in 1889 and 1901 respectively (Figures 07 and 08) show local field systems generally similar to the tithe map, with furze/gorse regularly noted, indicating marginal ground. Whilst the trapezoidal shaped field is visible on the first edition, it has been removed by the second edition along with a group of four fields to the immediate east, suggesting a reorganisation of this area between 1889 and 1901. A key difference between the tithe and Ordnance Survey maps is the presence of the Cambrian railway, which runs close to the development site. Collectively, the historic mapping information suggests that Harlech saw limited change during the nineteenth century, with more noticeable changes apparent in the twentieth century, as demonstrated by suburban expansion into an area that surrounds the proposed development, as well leisure developments including caravan parks. During the twentieth century, the large field incorporating the development was further expanded north to create a

larger irregular shaped field. Both on the historic mapping and current mapping, the area is also characterised by extensive drainage channels, reflecting the measures taken to improve what would have been marginal land with limited agricultural potential.

The historic mapping collectively provides a good understanding of the development of the study area from 1771 to the early 20th century, showing the changes wrought by the enclosure act and the subsequent development of the area through drainage and land apportionment, with further changes in the late nineteenth century. Overall, the maps show that until the twentieth century, this area was largely undeveloped and was used primarily as an agricultural resource.

3.3.5 Previous Historical and Archaeological Work

The proposed development plot and local area have not been subjected to any archaeological investigation or mitigation.

In 2003, Gwynedd Archaeological Trust completed a Historic landscape characterisation of Ardudwy (Report GAT_473). The report formed part of a series of landscape characterisation exercises being undertaken by the Welsh Archaeological Trusts with grant aid from Cadw that concentrated on those areas identified on the Historic Landscapes Register and was prepared in a form that was compatible with NRW's landscape assessment and decision-making methodology, known as LANDMAP. The aim of the report was to characterise the thirty-two character areas that comprised the Ardudwy Historic Landscape Characterisation and for the information to be made available to a wide range of organisations and feed into various initiatives to protect and manage the Welsh countryside, most notably the Tir Gofal agri-environment scheme. It is also seen as making a particularly important contribution to raising awareness and heightening a feeling of local distinctiveness. The proposed development plot was located in character area 30 (PRN 18263; cf. [para. 3.2.2.1](#)).

In 2009, Gwynedd Archaeological Trust completed an urban characterisation study of Harlech (Report GAT_787). The urban characterisation study was jointly funded by Cadw and Snowdonia National Park. The aim of the characterisation survey was to describe and explain the historic character of towns in order to inform and support positive conservation and regeneration programmes, as well as help improve the quality of planning advice, and contribute to local interpretation strategies. The survey aimed to define the distinctive historical character of Harlech and identify the variety of character within it. The study incorporated the urbanised area to the immediate south and east of the proposed development, incorporating the modern housing estates, the town and the castle environs; a total of nine character areas were defined, with the housing estates listed under area 09 – Ffordd Morfa. The report states that there was little potential for development within this area until the Enclosure Act of 1806 encouraged the drainage and enclosure of the former Harlech Marsh. There was little development until the construction of the railway in 1867 which encouraged growth in the area, although this was described in the report as relatively slight. The report states that it was not until the Second World War years that it became necessary to find a significant area of new building land. As most of the available land to the south was already used, the Ffordd Morfa provided ample space for new public and private housing, as well as a new school, sports centre and business park (Report GAT_787: 53). The report states that although the local area is dominated by the castle to the south, the developments in the Ffordd Morfa has adopted a contrasting style of its own, with the railway station and

adjoining hotel being typical of late 19th century development and the remainder being nearly all 20th century (*ibid.*).

3.3.6 *Artefact potential*

The presence of artefacts dating from the prehistoric to post-medieval times is thought likely to be **low**, due to the location of the proposed development plot within reclaimed agricultural land that has mainly seen use as livestock pasture. The plot has also been partly disturbed by modern services. The historic mapping suggests it was also in use as a post-medieval allotment, so there is some potential for artefacts associated with this activity to identified (e.g., gardening implements, domestic pottery fragments).

3.3.7 *Aerial Photographs and LiDAR*

3.3.7.1 Aerial Photographs

A total of 21 mid to late twentieth century aerial photographs supplied by Welsh Government were examined:

- 1941 4107 M2962 Ob 107 (Figure 09);
- 1941 4107 M2962 Ob 108;
- 1941 4107 M2962 Ob 109;
- 1941 4107 M2962 V 35;
- 1941 4107 M2962 V 36;
- 1942 4206 M2324 1_74 (Figure 10);
- 1942 4206 M2324 2_74;
- 1942 4206 M2324 2_75;
- 1946 4631 RAF106GUK1468 2414;
- 1948 4841 RAF540_39 5071;
- 1950 5050 540RAF359 Infra Red 5159;
- 1961 6112 RAF58_4514 0026;
- 1969 6957 RAF58_9682 074 enlg;
- 1971 7171 OS 71_210 056;
- 1971 7176 OS 71_234 145;
- 1971 7176 OS 71_234 183;
- 1986 Oct_Nov 8606 JAS61_86 0080;
- 1990 9001 ADAS 453 035;
- 1993 9313 RAF39_6152 0536 false oblique;
- 2000 Getmapping; and
- 2009 CIR Nextperspectives.

Sortie image 4107 frame 35, taken on 24th August 1941 (Figure 09), shows the development area and environs to be similar to preceding historic mapping, with no settlement or

development in the surrounding area and with the area characterised by a patchwork of fields and drainage channels. The site of the development area is visible as a long trapezoidal shaped field with what could be patches of gorse. Sortie image 4206 frame 20, taken on 15th May 1942 shows a similar layout (Figure 10), with the embankment more distinctive and with what appear to be gaps at the southern and northern ends, presumably for access. On both images, the embankment appears more established than the present day. The 1946 sortie image shows a trackway running across the site that runs from the side of the railway line to the southeast, across the southern end of the site and then westwards to the coast; the trackway appears to have been created by wheeled vehicles and appears to be an unmetalled track; it is no longer visible in the 1948 image. The images from 1950 to 1969 show little change in the immediate area around the development, but the extension of the urban area is visible, with housing estates moving northwards, whilst caravan parks have appeared between the A496 road and the coast; Ysgol Ardudwy is also present by this time. By 1986, there is additional housing to the east of the development site, with the images from the 1990s showing a similar pattern.

3.3.7.2 LiDAR

Digital Light Detection and Ranging (LiDAR) data was examined from the Lle Geo-Portal at <http://lle.gov.wales/home> for information on potential surface features. The 1m Digital Terrain Model was obtained for sheet SH5832 (Figure 11). The data shows the outline of the former field boundaries visible on historic mapping, as well as the footpath located outside of the development area. The embankment (Asset 2) that forms the eastern boundary of the proposed development plot is clearly visible. No other distinctive features are visible within or within proximity to the development area.

3.4 Field Survey

The field survey was completed on the 28th February 2023. The study area consisted of a trapezoidal shaped development plot immediately north and east of housing developments of 1960's to 1980's date on the northern edge of lower Harlech. The plot comprised improved grassland, with a very sandy silt topsoil. It was bordered to the west by a 0.6m high drystone wall, with a post and wire fence running along the wall inside the field (Asset 1; cf. Plate 07); runs parallel with the road pavement; to the south the plot is bounded by a footpath and post and wire fence that runs adjacent to the Pant yr Eithin housing estate. In the southwest corner of the field the route of below ground services has been surveyed in and is marked out with wooden pegs (Plates 1, 2 & 6) with manhole covers and associated infrastructure visible at surface level (Plates 8 & 9), along with overhead 11kV lines. The eastern edge of the development plot is bounded by a sandy silt embankment, about 10 m wide and 0.6 m high with a shallow profile (Asset 2; Plates 4, 5 & 12). This was interpreted as a former field boundary and flood defence, likely established after low lying land was reclaimed during the late medieval/post medieval period; the embankment is now considerably eroded and collapsed, helped by damage caused by livestock. The embankment appears spread out at the base, suggesting that it was once narrower and taller prior to this collapse. It is shown on the 1st edition Ordnance Survey Merionethshire County Series 25-inch to 1-mile Map Sheets XVIII.16 and XIX.13 (published 1889). The north and east sides of the development plot are open, as the large field extends all the way to the railway line to the southeast and the plot is not as yet enclosed. Patches of gorse were noted, particularly along the southern and western boundaries of the site, and along the embankment. The field had some undulations within it, particularly to the northern end of the plot, but these are thought to have been eroded windblown sand that has become consolidated, rather than any archaeological feature. To the northeast outside the development plot are the remains of a former stock enclosure, now only 0.25 m high, surviving as two or three courses of grey industrial brickwork (Plate 11). This is shown on the Ordnance Survey 1:10,000 map (Figure 01). The main road carriageway is on a slight embankment above the field level (Plate 14). A public footpath running southeast to northwest crosses the open field that contains the development plot (Plate 21).

The local area was characterised by extensive low lying land with a fairly uniform character, with higher ground around Coed Llechwedd to the southeast (Plates 24 & 25).

Further field subdivisions are shown on the historic mapping that cannot be seen on the ground now. The only historic boundary clearly identified clearly is the drystone wall to the west, which was clearly built as a road boundary wall, probably in the 19th century (Asset 1)

but could be earlier. The embankment (Asset 2) is of an unknown date but would appear to have been constructed in the way it has as a flood defence. Apart from the very modern stock enclosure located to the north of the development area (cf. Figure 01) no other features were identified. The field appears to be part of the land that was reclaimed here since medieval times and to have formed part of the enclosures/allotments shown on the allotment map of 1810 (Figure 04) and the Llandanwg Parish tithe map (Figure 06). The boundaries, very regular in layout, reflect the allotments shown on the 1810 map and suggest a very organized set-up. Some of them have been subsequently lost, including in the study area, between 1st and 2nd edition Ordnance Survey Merionethshire County Series 25-inch to 1-mile map (Sheets XVIII.16 and XIX.13 published 1889 & 1901 respectively; cf. Figures 07 & 08). This is presumably because the area became used as an agricultural field rather than used for small allotment plots.

The results from the field survey have been incorporated into the gazetteer of assets.

3.5 Gazetteer of Assets

3.5.1 Introduction

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.

3.5.2 *Assessment Category*

As stated in [para. 2.4](#), the sites recorded in the archaeological assessment have been divided into five categories (A to E), based on national (Category A), regional (Category B) or district/local importance (Category C), or whether they are minor sites (Category D) or sites needing further investigation (Category E).

3.5.3 Gazetteer

Asset Number	1
Site name	Boundary Wall
PRN number	n/a
Grid reference	SH582113201
Period	Post-medieval
Site type	Wall
Statutory Designation	None
Assessment category	C
Description	Drystone wall, with associated post and wire fence forming the western boundary of the development plot and separating the plot from the pavement that runs along the A496 road (cf. Plate 07. The wall is built from irregular sized sub-rectangular stone and reaches an average height of 0.60m; the post and wire fence is a recent addition.. The wall continues northwards beyond the extent of the development plot.
Impact	Unknown
Recommendation	If impacted, a basic record of the wall is recommended prior to construction works, including a written descriptive record and a photographic record along the affected length.

Asset Number	2
Site name	Embankment
PRN number	n/a
Grid reference	SH58253200
Period	Post-medieval
Site type	Boundary
Statutory Designation	n/a
Assessment category	C
Description	Earthen embankment forming the eastern boundary of the proposed development. Measures c.161m long, 10m wide and 0.6m high with a shallow profile (cf. Plates 4, 5 & 12). Interpreted as a former field boundary and flood defence, likely established after low lying land was reclaimed during the post medieval period; the embankment is now considerably eroded and collapsed, helped by damage caused by livestock. The embankment appears spread out at the base, suggesting that it was once narrower and taller prior to this collapse. This is supported by mid-twentieth century aerial photographs that appear to show it in a more established condition.
Impact	Unknown – but expected to be impacted by the development
Recommendation	If impacted, a basic record of the wall is recommended prior to construction works, including a written descriptive record and a photographic record along the affected length. This should be followed by a record of the interior profile if breached during construction works.

4 CONCLUSION AND RECOMMENDATIONS

Gwynedd Archaeological Trust was commissioned by William Homes (Bala) Ltd. to undertake an archaeological assessment in support of a proposed planning application for residential development on land to off the A496 road in Harlech, Gwynedd. The proposed development comprises 24No houses along with internal access, parking landscaping and drainage; the site area measures 0.82ha and incorporates a field of semi-improved pasture, which is bounded to the west by a drystone boundary wall, the south by a post and wire fence and the east by a low embankment. The report concluded that there are no known archaeological assets within the confines of the development area, with the surrounding area characterised by post-medieval field systems, drainage channels and modern settlement. The historic mapping suggested that the current field systems were mainly established in the early nineteenth century after the Enclosure Act of 1806, with the development area part of a field system owned by Lord Mostyn. The field systems were altered slightly during the late nineteenth and early twentieth century, but the overall character of the area remained little changed until after the Second World War, when the settlement expanded into lower Harlech along the A496 road, urbanising the local area. The proposed development would be an addition to this twentieth century expansion, extending the settlement zone that already exists to the immediate east and south. A magnetometer geophysical survey completed as part of the assessment did not identify any probable or possible archaeological anomalies, with the results dominated by bipolar linear anomalies likely to be associated with metallic service pipes concentrated along the southern, northern, and eastern boundary of the field. The walkover field survey completed as part of the assessment noted manhole covers associated with these services.

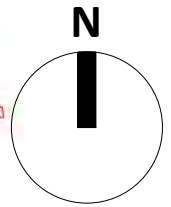
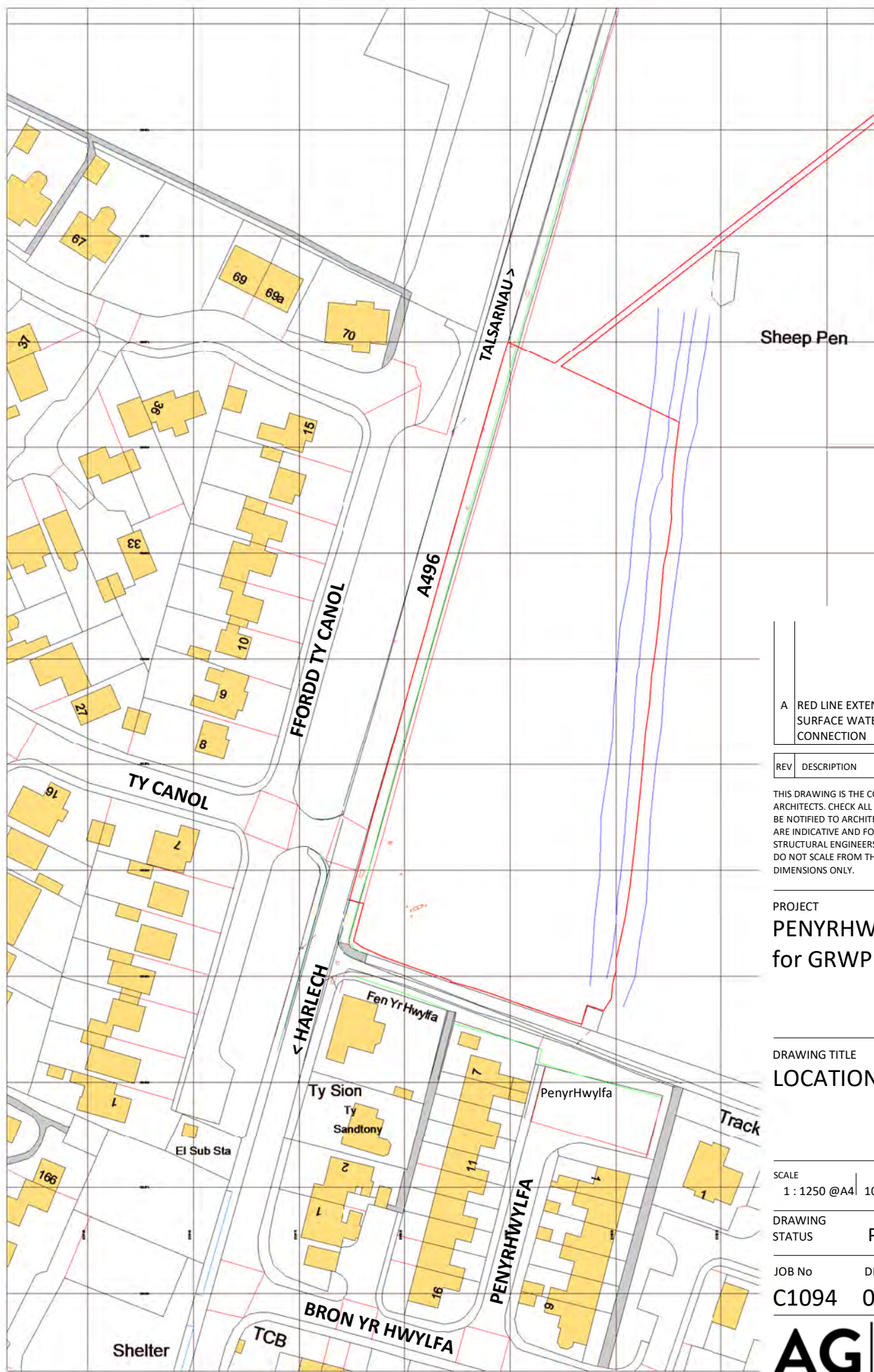
The development area is located within Ardudwy Historic Landscape Character Area 30, defined as an area of reclaimed marshland which is currently agricultural in nature and characterised by a regular pattern of fields, defined mainly by cut drainage features and/or earthen banks; the proposed development is located at the northern edge of Ardudwy Historic Landscape Character Area 24, which incorporates the urbanised area of Upper and Lower Harlech. The track of land is currently a field of pasture and is part of the Fieldscape of Area 30, Morfa Harlech. Whilst the proposals are for a relatively small development that is already flanked by existing houses to the south and west and as such would blend with the immediate surroundings, it will nonetheless change the boundary between the two distinct area Historic Landscape Character areas and the respective areas may need to be amended to reflect this limited change.

Whilst the proposed residential development is positioned c.550m north of the Scheduled Monument and World Heritage Site of Harlech Castle, Cadw have determined that it is not within a significant view of the castle and that the development will not have any effect on the way that the castle and World Heritage Site are experienced, understood and appreciated and that consequently, the proposed development will have no impact on the setting of scheduled monument outstanding universal values of the World Heritage Site.

It is not recommended that any further archaeological investigation is undertaken pre-development, but it is recommended that a watching brief is maintained during development to examine the below ground horizon for any activity associated with post-medieval agricultural expansion and settlement. If affected by the development, it is recommended that a basic record is made of the drystone wall and the embankment prior to works, along with a record of the embankment during construction.

5 SOURCES

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9. Guidelines for digital archives (Royal Commission on Ancient and Historic Monuments of Wales, 2015);
10. Gwynedd Archaeological Trust Report 473, 2004. Historic landscape characterisation of Ardudwy
11. Historic England, 2015, Management of Research Projects in the Historic Environment (MoRPHE)
12. Royal Commission on Ancient and Historic Monuments of Wales, 2015, Guidelines for digital archives



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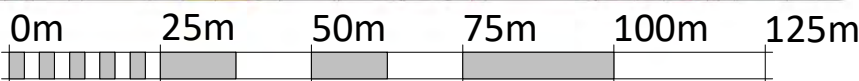
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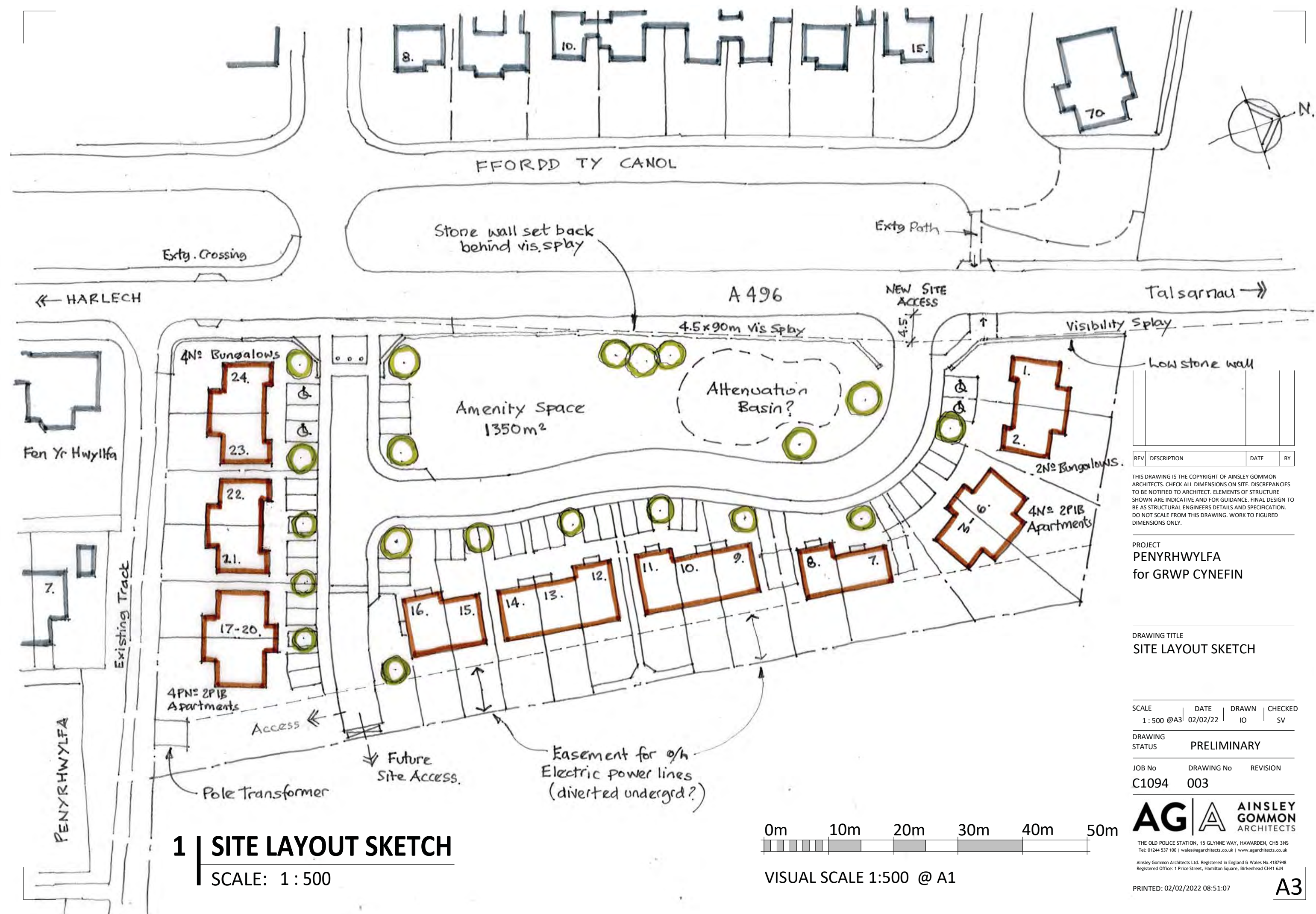
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STATUS PRELIMINARY

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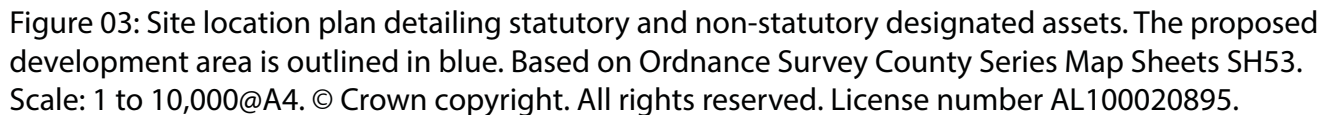


Figure 03: Site location plan detailing statutory and non-statutory designated assets. The proposed development area is outlined in blue. Based on Ordnance Survey County Series Map Sheets SH53. Scale: 1 to 10,000@A4. © Crown copyright. All rights reserved. License number AL100020895.



Figure 04: Reproduction of Mostyn MSS 8605 Map and Survey of Harlech Marsh in the Parish of Llandanwg and Llanfihangel y Traethu in the County of Meirioneth 1810 (Source: Bangor Archives; Mostyn MSS 8605).



Traethu (Source: Gwynedd Archives, Dolgellau; ZXP/9/33).

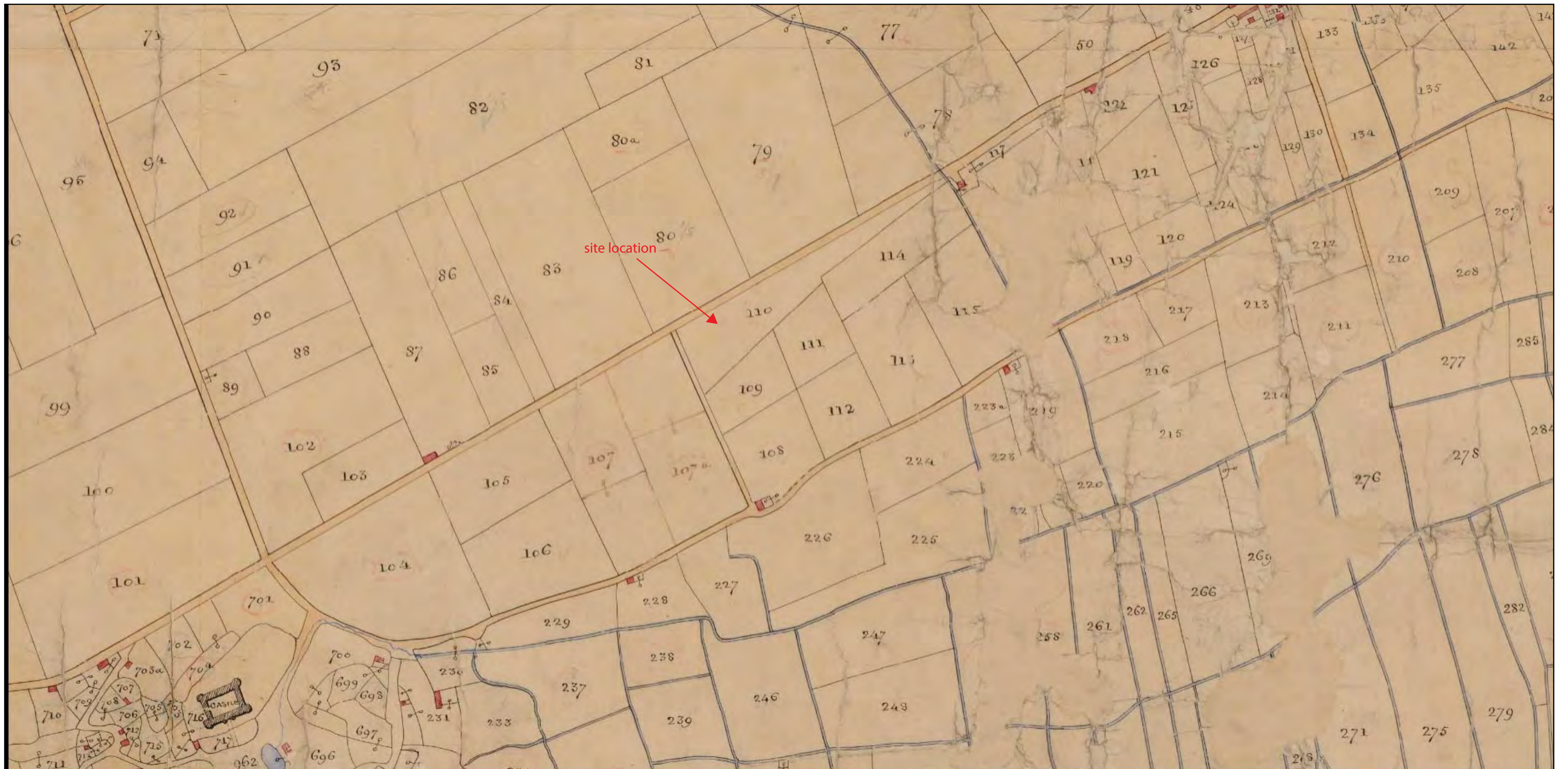


Figure 06: Reproduction of 1841 Llandanwg Parish Tithe Map.

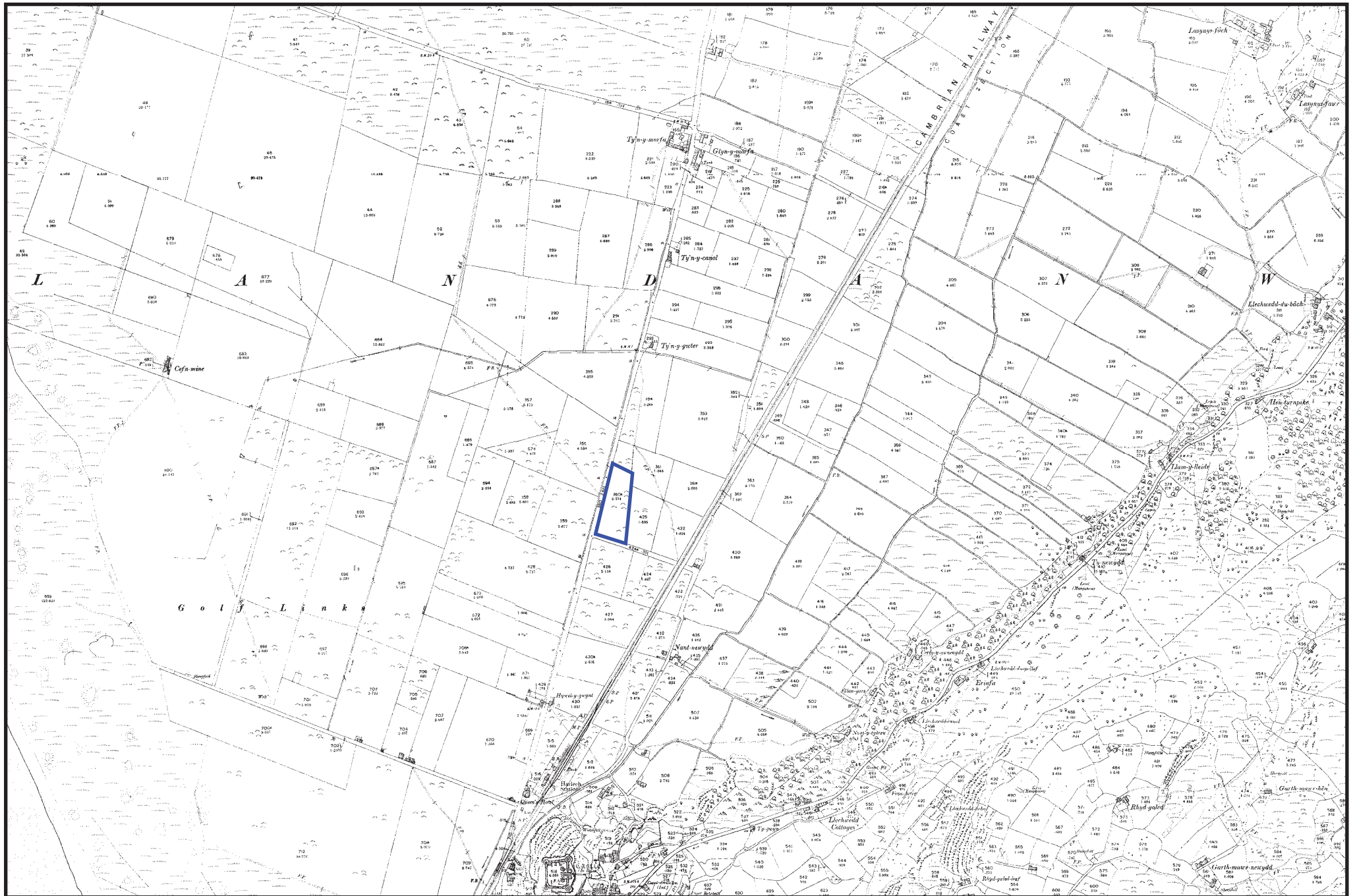




FIGURE 04: Reproduction of the Second Edition Ordnance Survey Merionethshire County Series 25-inch to 1-mile Map Sheets XVIII.16 and XIX.13 (published 1901). The proposed development area is outlined in blue. Scale: 1 to 10,000@A4.

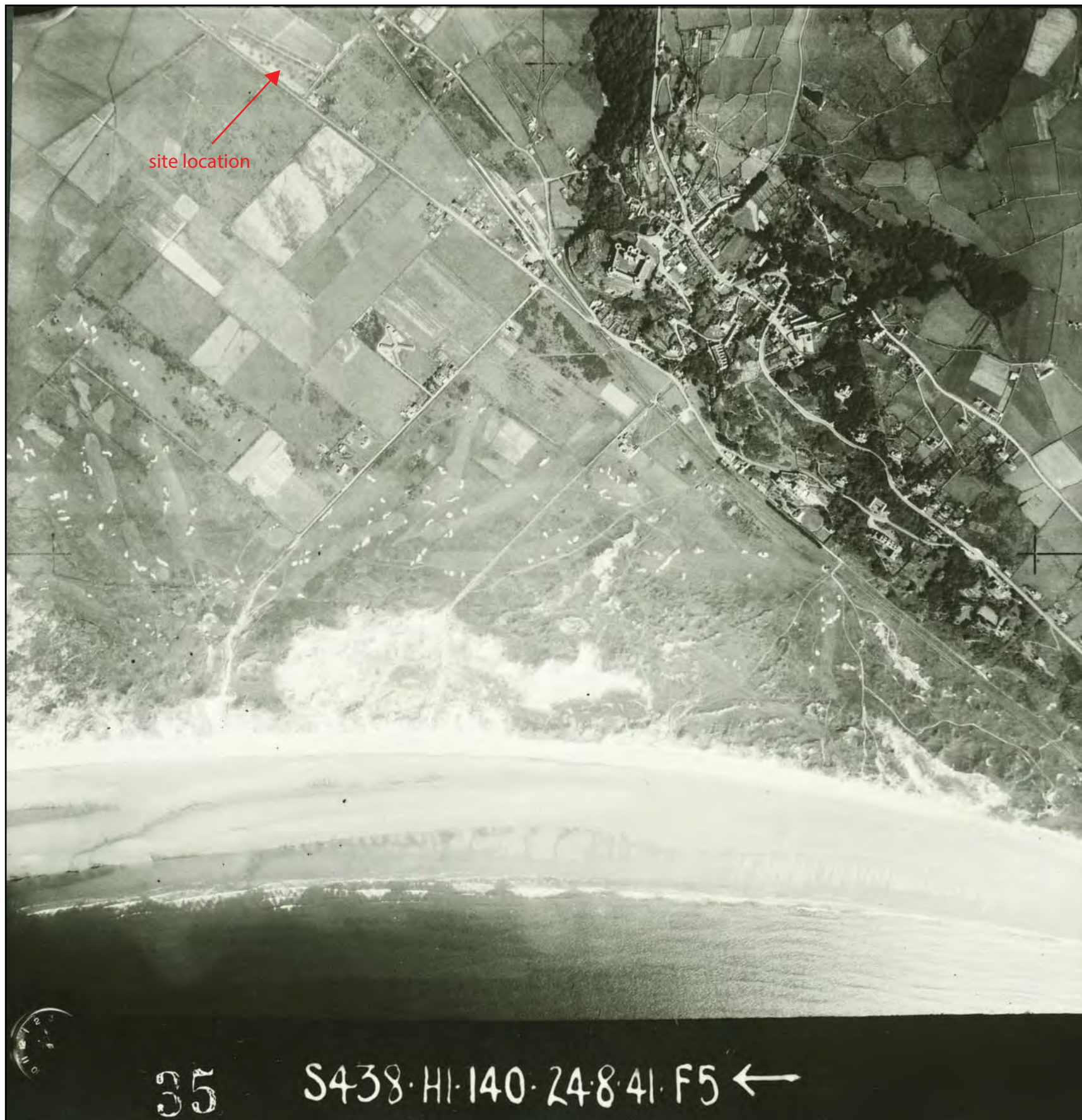


Figure 09: Reproduction of RAF 438/140 frame 35, taken on 24th August 1941. The proposed development area is located at the top of the image.



Figure 10: Reproduction of RAF 4206 frame 20, taken on 15th May 1942.

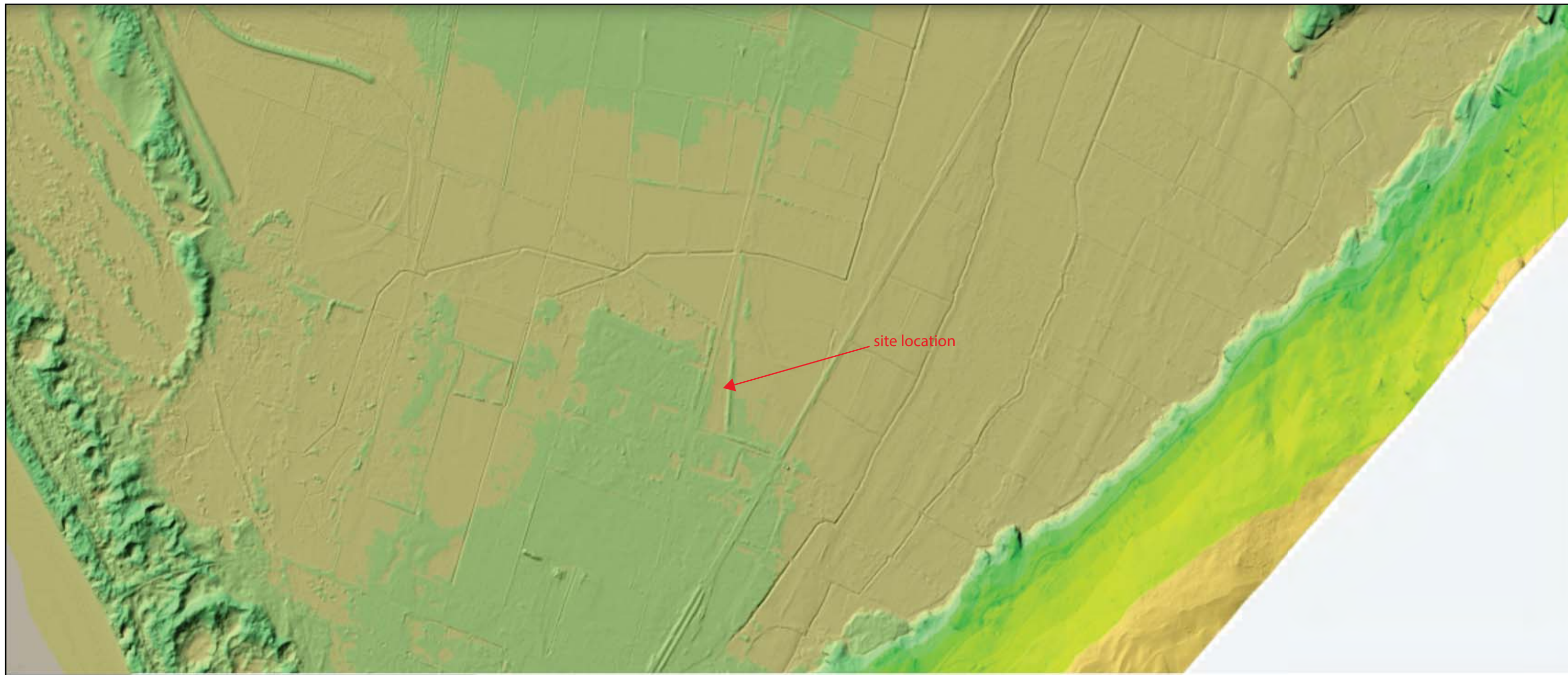


Figure 11: Light Detection and Ranging (LiDAR) digital terrain modelling data for area SH53. Source: Lle Geo-Portal.



Plate 1: General view of development plot from the SW corner, showing presence of services; scale 1m; view from WNW (archive reference: G2759_01).



Plate 2: General view of development plot from the SW corner, showing presence of services; scale 1m; view from SSW (archive reference: G2759_02).



Plate 3: General view of development plot from the SW corner, showing the view towards the castle to the S, and gorse covered boundaries to the W and E; scale 1m; view from NNE (archive reference: G2759_03).



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Plate 30: General view side-on from the railway line showing the bank and houses to the rear; scale not used; view from W (archive reference: G2759_30).



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Plate 33: General view along the road into Harlech showing setting (site on the left but somewhat obscured); scale not used; view from NNE (archive reference: G2759_33).

APPENDIX I

Gwynedd Archaeological Trust Written Scheme of Investigation

HARLECH, GWYNEDD (G2759)

WRITTEN SCHEME OF INVESTIGATION FOR AN
ARCHAEOLOGICAL ASSESSMENT AND
GEOPHYSICAL SURVEY

Prepared for William Homes (Bala) Ltd.

November 2022



Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

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

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

HARLECH, GWYNEDD (G2759)

WRITTEN SCHEME OF INVESTIGATION FOR AN ARCHAEOLOGICAL ASSESSMENT AND GEOPHYSICAL SURVEY

Prepared for *William Homes (Bala) Ltd.*, November 2022

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1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) has been commissioned by William Homes (Bala) Ltd. to undertake an archaeological assessment and geophysical survey in advance of a proposed residential development on land off the A496 road in Harlech, Gwynedd LL46 2NZ (NGR SH58233200; [Figure 01](#)). The assessment and geophysical survey will be undertaken in support of a planning application for 24No houses along with internal access, parking landscaping and drainage. The proposed development area measures 0.82ha and incorporates a field of semi-improved pasture.

The assessment and geophysical survey will be undertaken between February and March 2023, and will conform to the following guidelines:

- Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs) Version 2 (The Welsh Archaeological Trusts, 2022);
- 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, 2020);
- Standard and Guidance for historic environment desk-based assessment (Chartered Institute for Archaeologists, 2020);
- Standard and Guidance for The Collection, Documentation, Conservation and Research of Archaeological Materials (Chartered Institute for Archaeologists, 2020); and
- Standard and Guidance for The Creation, Compilation, Transfer and Deposition of Archaeological Archives (Chartered Institute for Archaeologists, 2020).

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 Aims & Objectives

The aims and objectives are to:

- a detailed breakdown of the known archaeology in the vicinity of the site;
- an assessment of previous land use compiled from an analysis of historical maps, aerial photographs and other archive materials;
- a listing of the heritage-related planning constraints that may affect the site;
- a ranking of the potential for archaeology of each of the archaeological periods to be found within the site; and
- understand the archaeological potential of the development site and allow for a better-informed planning recommendation through the application of a geophysical survey.
- provide recommendations, if necessary, for future intrusive survey and construction excavation activities on site (requirements that would need to be in place during these or similar activities).

1.2 Monitoring Arrangements

The archaeological 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.

1.3 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 GATHER1763 and the Event PRN is 46516. 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 2).

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

There are no known archaeological assets within the proposed development site. The regional Historic Environment Record (HER) lists mostly farmsteads within the local area, including Ty'n y Canol farm to the north (Primary Reference Numbers (PRN) 69426, 69700 to 69701) to the north.

Harlech Castle (Scheduled Monument Me044) is located at NGR SH58103125, c.700m south of the proposed development site.

The Llandanwg parish tithe map of the area, published in 1841, shows the development site within a trapezoidal shaped field, which is listed in the tithe apportionment as plot 110 and named as "Allotment" being kept as pasture as part of Red Lion farm. The field was occupied by a James Anwyl and owned by the Honourable Edward Mostyn Lloyd Mostyn. There seems to be limited change in the field patterns between the late-nineteenth/early twentieth century Merionethshire County Series 25-inch maps (Sheets XVIII.16 and XIX.13). The First and Second Edition Ordnance Survey maps, published in 1889 and 1901 respectively (Figures [03](#) and [04](#)) show local field systems generally similar to the tithe map, with furze/gorse regularly noted, indicating marginal ground. Whilst the trapezoidal shaped field is visible on the first edition, it has been removed by the second edition along with a group of four fields to the immediate east, suggesting a reorganisation of this area between 1889 and 1901. A key difference between the tithe and Ordnance Survey maps is the presence of the Cambrian railway, which runs close to the development site. Collectively, the historic mapping information suggests that Harlech saw limited change during the nineteenth century, with more noticeable changes apparent in the twentieth century, as demonstrated by suburban expansion into an area that surrounds the proposed development, as well leisure developments including caravan parks. During the twentieth century, the large field incorporating the development was further expanded north to create a larger irregular shaped field. Both on the historic mapping and current mapping, the area is also characterised by extensive drainage channels, reflecting the measures taken to improve what would have been marginal land with limited agricultural potential.

3 METHODOLOGY

3.1 Desk-Based Assessment

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” (ClfA 2020, 4).

The desk-based assessment will encompass the development site and a 500m buffer zone from which any known and suspected assets will be identified using 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 proposed development area, as detailed in Figures 01 and 02. Examination of the core HER will be undertaken, including the 25-inch County Series Ordnance Survey maps (Sheets XVIII.16 and XIX.13) and any secondary information held within the HER. All identified features will be mapped, described and added to a gazetteer of assets, with their relative importance 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;
4. The online 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, if open and accessible. Archive data will include historic mapping such as the 1841 parish of Llandanwg tithe map and schedule;
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 for area SH53.

3.2 Historic Landscape Character

The impact on the historic landscape character area for Ardudwy will be assessed. The proposed development is located at the boundary between urban area 24 Harlech; (Primary Reference Number 18257) and rural area 30 Morfa Harlech - fieldscape (PRN 18263) and the report will consider whether the development will extend the existing urbanised area and may cause the respective character boundaries to be redrawn. Reference will be made to the existing historic landscape characterisation report for Ardudwy (Report GAT_473).

3.3 Geophysical Survey

The geophysical survey will be undertaken by *360° Archaeology* for GAT and will incorporate the 0.82ha area defined in [Figure 01](#). The survey control will be predefined in AutoCAD prior to commencement; baselines will then be plotted within each field to ensure a comprehensive and even data coverage. The grid points associated with the baselines will be exported from CAD then imported into a Trimble R12 RTK Global Positioning System (GPS), or equivalent. This instrument will be used to set-out the grid points within the fields using bamboo flags as non-magnetic markers.

The survey will be conducted as a magnetometer survey. A magnetometer survey can identify targets with enhanced magnetic susceptibility, such as ditches, pits, former field systems and paleochannels. Fired structures such as hearths, kilns and ovens can also be identified using this technique as well as accumulations of ferrous metal within the sub-surface. The survey will be undertaken using a *Sensys Magneto MX PDA* 5 channel survey platform; the platform is GPS enabled using a mounted Trimble R12 antenna and will host five FGM650/3 sensors spaced 1.0m apart.

The data will be collected by a field computer mounted on the platform running MonMX Software. The software will record a GPS position every second from the NMEA stream with the gradiometer sensor readings recorded at 100Hz. The platform is pushed by the operator in straight traverses using the baselines for heading references.

To prevent drift within the data from external influences such as diurnal temperature changes, the system will be stabilised within a magnetically quiet area prior to data collection.

The collected data will be downloaded during a mid-day interval and at the end of the shift to monitor quality and the progression of the survey. The client will be updated of any issues encountered and notified of any significant anomalies that have been detected.

The data collected using the multi-sensor platform will be prepared for export using SENSYS DLMGPS software. The system geometry will be revised, and the results exported as a suitable .XYZ file for importation into Terrasurveyor v.3.0.33.10 software for further processing, interpretation and presentation.

The success of a magnetic survey detecting archaeological features is dependent upon a measurable contrast between the anomaly and the surrounding ground. The presence of ferrous materials, made ground and modern burnt remains can all produce strong responses that can mask the presence of archaeological features.

To ensure data quality, the operator is required to follow regular traverses pulling or pushing the survey cart at walking pace. The presence of dense vegetation or crops may restrict the

movement of the operator and limit the amount of data collected within these areas. Also, deeply ploughed fields could be hazardous enough to prevent data collection until secondary tillage has taken place to ensure a more even walking surface.

The data will be clipped at a level deemed appropriate to best show any possible archaeology and exported as greyscale raster images where they can be georeferenced and used for 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.

3.4 Walkover Survey

A walkover survey will be undertaken that will incorporate the proposed development site, as outlined blue in Figure 01 and the immediate environs (if accessible). The aim will be to visit and record known assets; the assets will be mapped and located in advance as part of the desk based assessment, using a combination of historic and GIS based data; this information will then be used to geo-locate features, which will then be located and described on GAT pro-formas. Any newly identified assets will also be recorded (NB. only assets that can be safely accessed will be directly recorded).

A handheld GPS unit will be used during the walkover survey. A photographic record will be maintained in RAW format using a digital SLR set to maximum resolution (Nikon D5100; resolution: 4,928 x 3,264 [16.2 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 G2757_001. Photographic images will be archived in TIFF format using Adobe Photoshop; the archive numbering system will start from the next sequential number available.

Following the completion of the respective assessment/evaluation stages, 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;

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

3.5 Gazetteer of Assets

A gazetteer will be compiled for any existing and newly identified assets *within the proposed development area*, based on information sourced from the desk-based assessment, geophysical survey and walkover survey; the gazetteer will be prepared in the following format:

Asset Number	
Site name	
PRN number	
Grid reference	
Period	
Site type	
Designation	
Assessment category	
Description	
Impact	
Recommendation	

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.

3.6 Data Management Plan

Archiving will be completed based on following task list;

1. Pro-formas: all cross referenced and scanned for digital archiving;
2. Photographic Metadata: cross-referenced with all pro-formas and completed in *Microsoft Excel*;

This data will then be used as the basis for the physical and digital dataset archives. Information from these will be used to compile the project report. The physical archive will be stored in a designated project folder and the location confirmed in the Trust project database; the digital dataset will be stored on a dedicated Trust server, with the location confirmed in the Trust project database via a specific hyperlink. External datasets for the HER and RCAHMW are as defined in the dissemination strategy below. De-selected digital data will be confirmed in an updated digital management plan appended to the final report.

A draft report will be submitted within one month of fieldwork completion and a final report will be submitted to the regional Historic Environment Record within six months of project completion. The report will include the following:

1. Front cover;
2. Inner cover;
3. Figures and Plates List;
4. Non-technical summary (Welsh/English);
5. Introduction;
6. Methodology;
 - a. Desk-based assessment;
 - b. Field 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. Geophysical Survey
 - c. Walkover 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;
 - geophysical anomalies (greyscale and interpretation)
 - location plan with identified features.
- 12. Plates; inc.
 - Illustrative examples from the field survey
- 13. Appendix I (approved written scheme of investigation);
- 14. Appendix II (Assets Table);
- 15. Appendix III (Photographic metadata - field survey);
- 16. Appendix IV (GAT selection strategy final);
- 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.

On final approval, the following dissemination and archiving of the report and digital dataset will apply:

- A digital report(s) will be provided to the client and GAPS (draft report then final report);
- A digital report will be provided to the regional Historic Environment Record; this will be submitted within six months of project completion (final report only), along with a digital dataset comprising an Event PRN summary. The report and dataset will be submitted in accordance with the required standards set out in *Guidance for the*

Submission of Data to the Welsh Historic Environment Records (HERs) (Version 2);
and

- A digital report and digital archive dataset 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*. The dataset will be prepared in the format required by RCAHMW and will include:
 - o Photographic metadata (Microsoft Access);
 - o Photographic archive (TIFF format);
 - o Project Information form (Excel);
 - o File Information form (Excel) – Microsoft Word report text final;
 - o File Information form (Excel) – Photographic metadata (general);
 - o File Information form (Excel) – Adobe PDF report final; and
 - o File Information form (Excel) - Photographic metadata (detail).

3.7 Selection Strategy

As defined in *Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives* (Chartered Institute for Archaeologists, 2020) section 3.3.1, a project specific selection strategy and data management plan should be prepared. In support of this, the Chartered Institute for Archaeologist (CIfA), have stated that it is “widely accepted that not all the records and materials collected or created during the course of an Archaeological Project require preservation in perpetuity. These records and materials constitute the Working Project Archive which will be subject to Selection, in order to establish what will be retained for long-term curation”. The aim of selection is to ensure that all the elements retained from the Working Project Archive for inclusion in the Archaeological Archive are appropriate to establish the significance of the project and support “future research, outreach, engagement, display and learning activities”. Selection should be “focused on selecting what is to be retained to support these future needs, rather than deciding what can be dispersed” and can be qualified by a selection strategy, which details the project-specific selection process, agreed by all parties (including GAPS, client and/or landowner), which will be applied to a Working Project Archive prior to its transfer into curatorial care as the Archaeological Archive.

The selection strategy will be summarised in [Appendix III](#) and will be confirmed in the mitigation report; the strategy will take into account:

- The aims and objectives of the project.
- The brief and/or Written Scheme of Investigation (WSI)).
- The Collecting Institution’s collection policy and/or deposition guidelines.
- Local and regional research frameworks.
- Relevant thematic or period specific research frameworks.
- The project’s Data Management Plan (DMP).
- Internal recording and reporting policies.
- Material-specific guidance documents.

4 PERSONNEL

The project will be managed by John Roberts, Principal Archaeologist GAT Contracts Section and will be completed by a team led by a Senior Archaeologist, who will also have responsibility for interpreting and presenting the survey and preparing the report. 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 occurrence and in the aggregate in respect of Product Liability

INSURER Ecclesiastical Insurance Office Plc.

POLICY TYPE Public/Products Liability

POLICY NUMBER UN/000375

EXPIRY DATE 21st June 2023

5.2 Employers Liability

Limit of Indemnity- £10,000,000 any one occurrence.

INSURER Ecclesiastical Insurance Office Plc.

POLICY TYPE Employers Liability

POLICY NUMBER 24765101 CHC / UN/000375

EXPIRY DATE 21st June 2023

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-PSC10002389775/01

EXPIRY DATE 22nd July 2022

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 2 (The Welsh Archaeological Trusts, 2022)
4. Royal Commission on Ancient and Historic Monuments of Wales 2015 *Guidelines for digital archives*
5. *Standard and Guidance for Archaeological Geophysical Survey* (Chartered Institute for Archaeologists, 2020).
6. *Standard and Guidance for historic environment desk-based assessment* (Chartered Institute for Archaeologists, 2020);
7. *Standard and Guidance for The Collection, Documentation, Conservation and Research of Archaeological Materials* (Chartered Institute for Archaeologists, 2020); and
8. *Standard and Guidance for The Creation, Compilation, Transfer and Deposition of Archaeological Archives* (Chartered Institute for Archaeologists, 2020).

FIGURE 01

Site location plan. The proposed development area is outlined in blue. Based on Ordnance Survey County Series Map Sheets SH53. Scale: 1 to 10,000@A4. © Crown copyright. All rights reserved. License number AL100020895

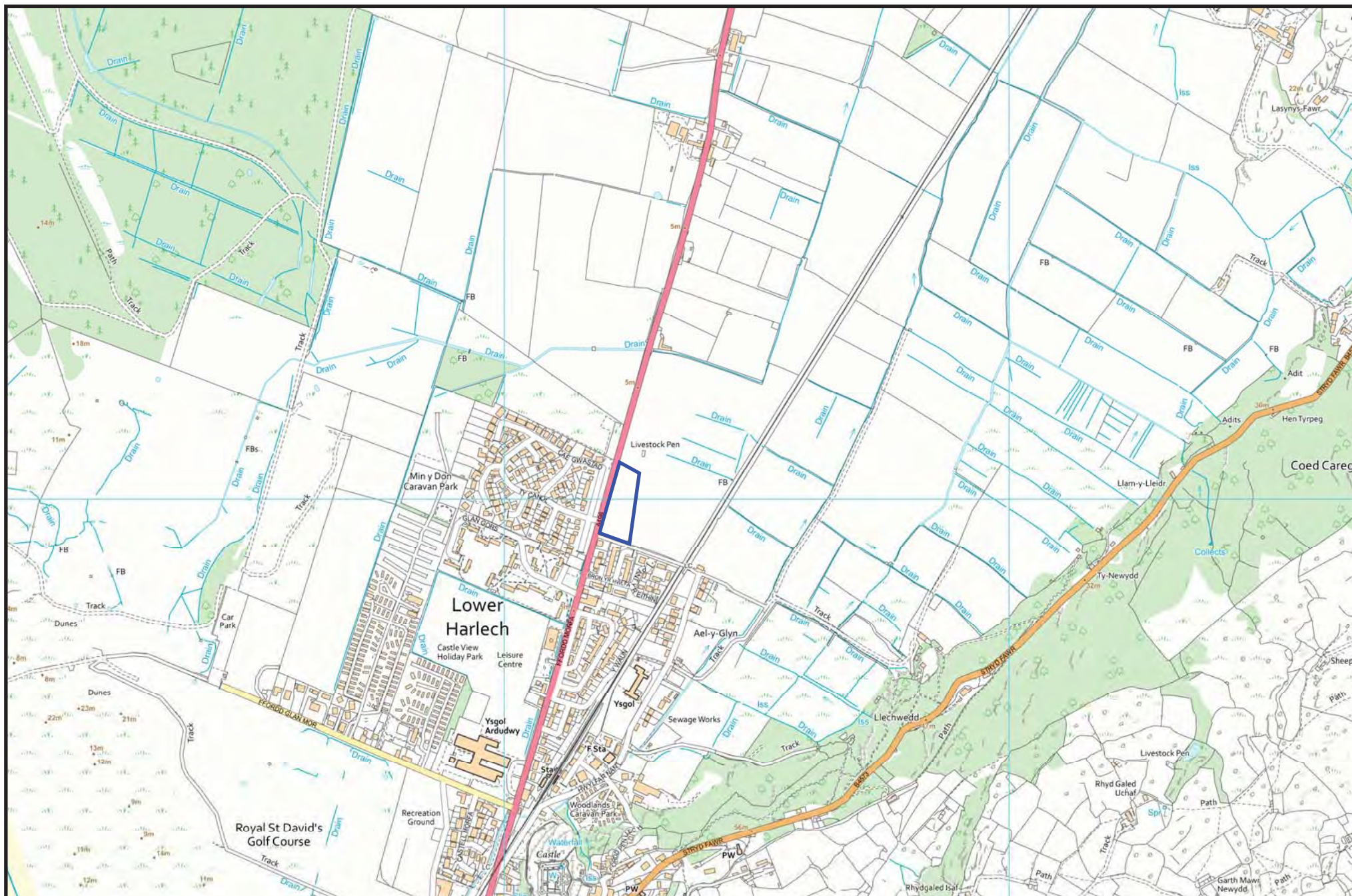


FIGURE 01: Site location plan. The proposed development area is outlined in blue. Based on Ordnance Survey County Series Map Sheets SH53. Scale: 1 to 10,000@A4. © Crown copyright. All rights reserved. License number AL100020895

FIGURE 02

Reproduction of Ainsley Gommon Architects Drawing No. 003 detailing preliminary site layout



FIGURE 03

Reproduction of the First Edition Ordnance Survey Merionethshire County Series 25-inch to 1-mile Map Sheets XVIII.16 and XIX.13 (published 1889). The proposed development area is outlined in blue. Scale: 1 to 10,000@A4.

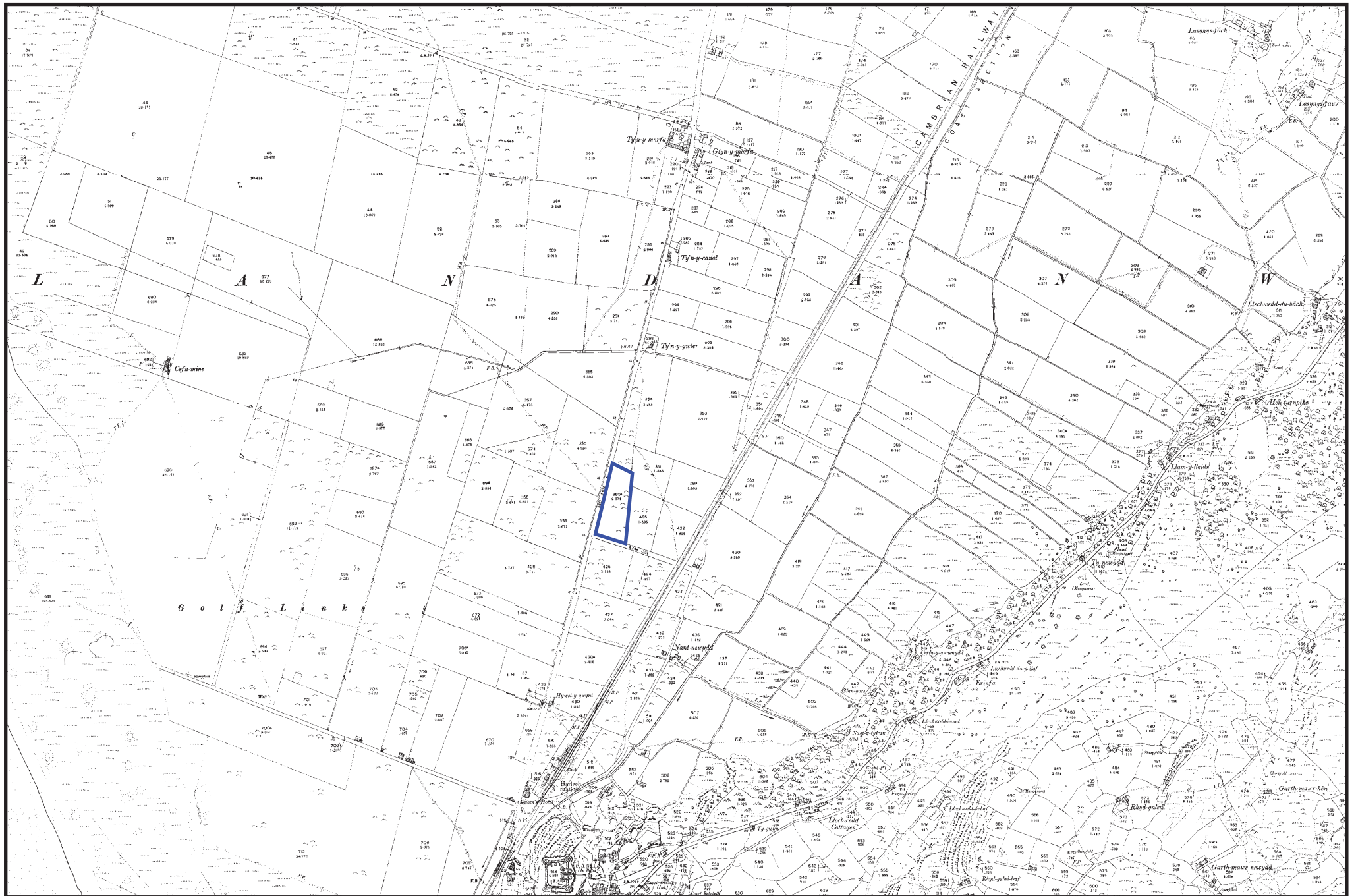


FIGURE 03: Reproduction of the First Edition Ordnance Survey Merionethshire County Series 25-inch to 1-mile Map Sheets XVIII.16 and XIX.13 (published 1889). The proposed development area is outlined in blue. Scale: 1 to 10,000@A4.

FIGURE 04

Reproduction of the Second Edition Ordnance Survey Merionethshire County Series 25-inch to 1-mile Map Sheets XVIII.16 and XIX.13 (published 1901). The proposed development area is outlined in blue. Scale: 1 to 10,000@A4.



FIGURE 04: Reproduction of the Second Edition Ordnance Survey Merionethshire County Series 25-inch to 1-mile Map Sheets XVIII.16 and XIX.13 (published 1901). The proposed development area is outlined in blue. Scale: 1 to 10,000@A4.

APPENDIX I

Gwynedd Archaeological Trust Basic Recording Pro-Forma

YMDDIRIEDOLAETH ARCHAEOLEGOL GWYNEDD ARCHAEOLOGICAL TRUST		
BASIC RECORDING FORM	Project name	Project number
Feature name		Feature Number
NGR		
Description		
Recommendations for further assessment		
Photographic record numbers		
Digital		
	Visit date	Visit by

APPENDIX II

Gwynedd Archaeological Trust Photographic Metadata Pro-Forma



Digital Photographic Record Project code and name:

Include main context numbers for each shot, drawing numbers for sections and any other relevant numbers for cross referencing.

Delete any unwanted photos **immediately** from the camera.

Regularly upload photographs to computer.

[illegible]

APPENDIX III

Gwynedd Archaeological Trust Selection Strategy pro-forma

G2760_Harlech

30/11/2022 v1.0

Selection Strategy

Project Information

Project Management

Project Manager	John Roberts john.roberts @heneb.co.uk	
Archaeological Archive Manager	John Roberts john.roberts @heneb.co.uk	
Organisation	Gwynedd Archaeological Trust	
Stakeholders		Date Contacted
Collecting Institution(s)	GAT Historic Environment Record	29/11/2022
	RCAHMW	On completion of Project Archive
Project Assurance	Tom Fildes, Gwynedd Archaeological, Gwynedd Archaeological Planning Service	12/09/2022
Landowner / Developer	FI Real Estate Management	n/a

Resources

Resources required

Describe the resources required to implement this Selection Strategy, particularly if unusual resources are required.

No unusual resources required outside of GAT normal operating equipment and personnel.

Context

The full aims and objectives of this project are detailed in the project specific WSI.

Gwynedd Archaeological Trust (GAT) has been commissioned by William Homes (Bala) Ltd. to undertake an archaeological assessment and geophysical survey in advance of a proposed residential development on land off the A496 road in Harlech, Gwynedd LL46 2NZ (NGR SH58233200; WSI Figure 01). The assessment and geophysical survey will be undertaken in support of a planning application for 24No houses along with internal access, parking landscaping and drainage. The proposed development area

measures 0.82ha and incorporates a field of semi- improved pasture. The assessment and geophysical survey will be undertaken between December 2022 and January 2023

Gwynedd Archaeological Trust. 2022. Harlech, Gwynedd Written Scheme of Investigation for an Archaeological Assessment and Geophysical Survey. Project (G2760).

1 – Digital Data

Stakeholders

John Roberts (GAT Principal Archaeologist)

Selection

All digital data will be collected, stored and selected in lines with the Gwynedd Archaeological Trust (GAT) Data Management Plan located on GAT's servers (available on request).

Following the completion of the fieldwork, a working project archive will be created 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;

All relevant site archive data will be added to a digital project register specific to this project, which will be prepared in *Microsoft Excel*.

This data will be used as the basis for the physical and digital dataset archives. Information from these will be used to compile the project report. The physical archive will be stored in a designated project folder and the location confirmed in the Trust project database; the digital dataset will be stored on a dedicated Trust server, with the location confirmed in the Trust project database via a specific hyperlink. External datasets for the HER and RCAHMW are as defined in the dissemination strategy below. De-selected digital data will be confirmed in an updated digital management plan appended to the final report

De-Selected Digital Data

It is envisaged that the de-selected material will be retained on the GAT servers for 2 years following the completion of the project at which point they will be reviewed and deleted as necessary in line with the GAT DMP.

2 – Documents

Stakeholders

John Roberts – Principal Archaeologist, Gwynedd Archaeological Trust;
Sean Derby – Historic Environment Record, Gwynedd Archaeological Trust;
Gareth Edwards, *Head of Knowledge and Understanding, RCAHMW*

Selection

- A digital report will be provided to the regional Historic Environment Record; this will be submitted within six months of project completion (final report only), along with a digital dataset comprising an Event PRN summary. The report and dataset will be submitted in accordance with 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 digital archive dataset 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*. The dataset will be prepared in the format required by RCAHMW and will include:
 - o Photographic metadata (Microsoft Access);
 - o Photographic archive (TIFF format);
 - o Project Information form (Excel);
 - o File Information form (Excel) – Microsoft Word report text final;
 - o File Information form (Excel) – Photographic metadata (general);
 - o File Information form (Excel) – Adobe PDF report final; and
 - o File Information form (Excel) - Photographic metadata (detail).

De-Selected Documents

It is envisaged that the material de-selected from inclusion in the preserved archive will be duplicates or reproductions created during the analysis phase of the project. De-selected material will therefore either be retained to supplement GAT's research files or recycled.

APPENDIX II

Gwynedd Archaeological Trust Photographic Metadata

PHOTO RECORD NUMBER	PROJECT NAME	PROJECT PHASE	DESCRIPTION	VIEW FROM	SCALE(S)	CREATOR OF DIGITAL PHOTO	DATE	ORIGINATING ORGANISATION	PLATE
G2759_01	Harlech	Assessment	General view of development plot from the SW corner, showing presence of services	WNW	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	1
G2759_02	Harlech	Assessment	General view of development plot from the SW corner, showing presence of services	SSW	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	2
G2759_03	Harlech	Assessment	General view of development plot from the SW corner, showing the view towards the castle to the S, and gorse covered boundaries to the W and E	NNE	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	3
G2759_04	Harlech	Assessment	View along grassed, sandy and gorse covered embankment that runs along the east side of the development plot	NNE	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	4
G2759_05	Harlech	Assessment	View along grassed, sandy and gorse covered embankment that runs along the east side of the development plot	SSW	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	5
G2759_06	Harlech	Assessment	View along the southern plot boundary, showing line of services pegged out, and southern post and wire boundary fence	ESE	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	6
G2759_07	Harlech	Assessment	View along the western low drystone wall alongside the road boundary (0.6 m high)	NE	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	7
G2759_08	Harlech	Assessment	View of services within the development plot	NW	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	8
G2759_09	Harlech	Assessment	View of services within the development plot	NW	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	9

PHOTO RECORD NUMBER	PROJECT NAME	PROJECT PHASE	DESCRIPTION	VIEW FROM	SCALE(S)	CREATOR OF DIGITAL PHOTO	DATE	ORIGINATING ORGANISATION	PLATE
G2759_10	Harlech	Assessment	General view from the top of the embankment showing the development plot and Harlech beyond	NE	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	10
G2759_11	Harlech	Assessment	View of the remnants of the former livestock pen shown on the map	N	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	11
G2759_12	Harlech	Assessment	View along the top of the sandy embankment	NNE	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	12
G2759_13	Harlech	Assessment	View of elevation of drystone wall bordering the road	E	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	13
G2759_14	Harlech	Assessment	View along drystone wall at northern end of plot, showing slightly raised road carriageway	S	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	14
G2759_15	Harlech	Assessment	Angled view of development plot from the NW corner, showing the embankment	NW	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	15
G2759_16	Harlech	Assessment	View along the pegs of the marked out services	N	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	16
G2759_17	Harlech	Assessment	General view of the development area from the footpath to the south	SSE	not used	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	17
G2759_18	Harlech	Assessment	General view showing the SW corner of the development area and the footpath adjacent to the housing	W	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	18

PHOTO RECORD NUMBER	PROJECT NAME	PROJECT PHASE	DESCRIPTION	VIEW FROM	SCALE(S)	CREATOR OF DIGITAL PHOTO	DATE	ORIGINATING ORGANISATION	PLATE
G2759_19	Harlech	Assessment	General view from the road verge of the proposed development area showing Harlech in the background	NNW	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	19
G2759_20	Harlech	Assessment	View of the embankment from the roadside verge	N	not used	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	20
G2759_21	Harlech	Assessment	General view of the development area from the railway line, showing the east side of the embankment, the footpath, and Cae Gwastad Housing beyond	ESE	not used	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	21
G2759_22	Harlech	Assessment	View of gorse covered embankment from the public footpath	SSE	not used	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	22
G2759_23	Harlech	Assessment	General elevated view from the castle rock showing the study area on the edge of town	S	not used	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	23
G2759_24	Harlech	Assessment	General view of study area from B4573 through Llechwedd forest (Gap in afforested cover on slope)	E	not used	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	24
G2759_25	Harlech	Assessment	General view of study area from B4573 near town (angled)	SW	not used	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	25
G2759_26	Harlech	Assessment	Side-on view of earthen bank (Feature 2) with story board	ESE	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	26
G2759_27	Harlech	Assessment	Angled view of earthen bank (Feature 2) with story board	SW	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	27

PHOTO RECORD NUMBER	PROJECT NAME	PROJECT PHASE	DESCRIPTION	VIEW FROM	SCALE(S)	CREATOR OF DIGITAL PHOTO	DATE	ORIGINATING ORGANISATION	PLATE
G2759_28	Harlech	Assessment	Angled view of earthen bank (Feature 2) with story board, showing the bank petering out to the north	SW	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	28
G2759_29	Harlech	Assessment	Angled view of earthen/sand bank	NW	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	29
G2759_30	Harlech	Assessment	General view side-on from the railway line showing the bank and houses to the rear	W	not used	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	30
G2759_31	Harlech	Assessment	Style access to field from adjacent to the railway line	SE	1m	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	31
G2759_32	Harlech	Assessment	General view of the proposed development area from the west (housing estate)	W	not used	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	32
G2759_33	Harlech	Assessment	General view along the road into Harlech showing setting (site on the left but somewhat obscured)	NNE	not used	Rob Evans	28/02/2023	Gwynedd Archaeological Trust	33

PRN	Site Name	Summary	Description	Period	Type	Status	Status Grade	Status Ref	Grid Reference
63903	Barn S of Ael-y-Glyn	A late 18th century or early 19th century barn.	Small rectangular barn of local rubble construction with slab-coped and roughly-kneelered gable parapets; old slate roof. Entrances to the centre on each side, with slate lintels; rectangular ventilator in the lane-facing gable. The interior was not ins	Post Medieval	Barn	Listed Building	II	25517	SH5834531682
57448	Building, E of Tan-y-Coed		Site identified using early Ordnance Survey Maps (McGuiness, 2014)	Post Medieval	Building	Snowdonia National Park		0	SH5824931392
57445	Building, N of Cerrig-y-Gwaenydd		This site was originally recorded as PRN69732 under project G2496. Site identified using early Ordnance Survey Maps (McGuiness, 2014)	Post Medieval	Building	Snowdonia National Park		0	SH5882431705
57444	Building, W of Cerrig-y-Gwaenydd		This site was originally recorded as PRN69733 under project G2496. Site identified using early Ordnance Survey Maps (McGuiness, 2014)	Post Medieval	Building	Snowdonia National Park		0	SH5881731685

PRN	Site Name	Summary	Description	Period	Type	Status	Status Grade	Status Ref	Grid Reference
69436	Cerig-y-gwaenydd, Harelch	A post medieval farmstead.		Post Medieval	Farmstead	Snowdonia National Park		0	SH58823168
63899	Cow House S of Ael-y-Glyn	A late 18th or early 19th century cow house.	Small rectangular cow house of local rubble construction with roughly-kneelered rubble gable parapets; old slate roof. Entrance to the side opposite the lane; small later buttress to the R on the lane-facing side. The interior was not inspected at the t	Post Medieval	Cow Shed	Listed Building	II	25518	SH5833431678
59754	Culvert, Harlech		A stone-lined drainage ditch or culvert, flowing north-eastwards, approximately 1.2 metres wide. It is possible that this represents the course of the channel which once gave ships access to Harlech. (Gwyn, 1996)	Unknown	Culvert	Snowdonia National Park		0	SH58263150
67050	Ffordd Morfa, Harlech, Urban Character Area	Ffordd Morfa - designated an Urban Character Area.	Historical development There was little potential for development within this area until the Enclosure Act of 1806 encouraged the drainage and enclosure of the former Harlech Marsh. Even after this, however, there was little development until the cons	Multiperiod	Landscape	Snowdonia National Park		0	SH5802431711

APPENDIX III

Table of Statutory and Non-Statutory Designated Assets within a 500m assessment buffer.

PRN	Site Name	Summary	Description	Period	Type	Status	Status Grade	Status Ref	Grid Reference
57446	Glan-gors, SW of Cerrig-y-Gwaenydd		Site identified using early Ordnance Survey Maps (McGuinness, 2014)	Post Medieval	Building	Snowdonia National Park		0	SH5873931601
67051	Llechwedd, Harlech, Urban Character Area	Llechwedd - designated an Urban Character Area.	Historical development This area lies outside the urban development of Harlech, but includes the road from Eisingrug, Maes y Neuadd and Glyn Cywarch from the north along the steep wooded slopes that separate the upland fields from the lowland morfa. I	Multiperiod	Landscape	Snowdonia National Park		0	SH5860331595
57447	Nant-y-tylcau, NW of Bron Meini		Site identified using early Ordnance Survey Maps (McGuinness, 2014)	Post Medieval	Farmstead	Snowdonia National Park		0	SH5865931514

APPENDIX IV

Gwynedd Archaeological Trust Selection Strategy

G2760_Harlech

03/03/2022 v2.0

Selection Strategy

Project Information

Project Management

Project Manager	John Roberts john.roberts @heneb.co.uk	
Archaeological Archive Manager	John Roberts john.roberts @heneb.co.uk	
Organisation	Gwynedd Archaeological Trust	
Stakeholders		Date Contacted
Collecting Institution(s)	GAT Historic Environment Record	29/11/2022
	RCAHMW	On completion of Project Archive
Project Assurance	Tom Fildes, Gwynedd Archaeological, Gwynedd Archaeological Planning Service	12/09/2022
Landowner / Developer	William Homes (Bala) Ltd.	n/a

Resources

Resources required Describe the resources required to implement this Selection Strategy, particularly if unusual resources are required.	No unusual resources required outside of GAT normal operating equipment and personnel.
--	--

Context

The full aims and objectives of this project are detailed in the project specific WSI.

Gwynedd Archaeological Trust (GAT) has been commissioned by William Homes (Bala) Ltd. to undertake an archaeological assessment and geophysical survey in advance of a proposed residential development on land off the A496 road in Harlech, Gwynedd LL46 2NZ (NGR SH58233200; WSI Figure 01). The assessment and geophysical survey has been undertaken in support of a planning application for 24No houses along with internal access, parking landscaping and drainage. The proposed development area

measures 0.82ha and incorporates a field of semi- improved pasture. The assessment and geophysical survey has been undertaken between December 2022 and January 2023

Gwynedd Archaeological Trust. 2022. Harlech, Gwynedd Written Scheme of Investigation for an Archaeological Assessment and Geophysical Survey. Project (G2760).

1 – Digital Data

Stakeholders

John Roberts (GAT Principal Archaeologist)

Selection

All digital data has been collected, stored and selected in lines with the Gwynedd Archaeological Trust (GAT) Data Management Plan located on GAT's servers (available on request).

Following the completion of the fieldwork, a working project archive has been created 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;

All relevant site archive data has been added to a digital project register specific to this project, which has been prepared in *Microsoft Excel*.

This data has been used as the basis for the physical and digital dataset archives. Information from these has been used to compile the project report. The physical archive has been stored in a designated project folder and the location confirmed in the Trust project database; the digital dataset has been stored on a dedicated Trust server, with the location confirmed in the Trust project database via a specific hyperlink. External datasets for the HER and RCAHMW are as defined in the dissemination strategy below. De-selected digital data has been confirmed in an updated digital management plan appended to the final report

De-Selected Digital Data

It is envisaged that the de-selected material has been retained on the GAT servers for 2 years following the completion of the project at which point they has been reviewed and deleted as necessary in line with the GAT DMP.

2 – Documents

Stakeholders

John Roberts – Principal Archaeologist, Gwynedd Archaeological Trust;
Sean Derby – Historic Environment Record, Gwynedd Archaeological Trust;
Gareth Edwards, *Head of Knowledge and Understanding, RCAHMW*

Selection

- A digital report has been provided to the regional Historic Environment Record; this has been submitted within six months of project completion (final report only), along with a digital dataset comprising an Event PRN summary. The report and dataset has been submitted in accordance with 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 digital archive dataset has been provided to Royal Commission on Ancient and Historic Monuments, Wales (final report only), in accordance with the *RCAHMW Guidelines for Digital Archives Version 1*. The dataset has been prepared in the format required by RCAHMW and will include:
 - o Photographic metadata (Microsoft Access);
 - o Photographic archive (TIFF format);
 - o Project Information form (Excel);
 - o File Information form (Excel) – Microsoft Word report text final;
 - o File Information form (Excel) – Photographic metadata (general);
 - o File Information form (Excel) – Adobe PDF report final; and
 - o File Information form (Excel) - Photographic metadata (detail).

De-Selected Documents

It is envisaged that the material de-selected from inclusion in the preserved archive has been duplicates or reproductions created during the analysis phase of the project. De-selected material will therefore either be retained to supplement GAT's research files or recycled.

APPENDIX V

Reproduction of 360 Archaeology Report PN 3948



Harlech Gwynedd

Geophysical Survey

PN: 3948

December 2022



360 ARCHAEOLOGY

UNIT 3, MANDALE PARK, NORTH SHIELDS,
TYNE & WEAR, NE29 7FN

0191 594 7672
ADMIN@360HQ.CO.UK

WWW.360HQ.CO.UK

Harlech Gwynedd

Geophysical Survey

December 2022

Project reference	3948
GAT project #	G2759_Harlech
On behalf of	Gwynedd Archaeological Trust
Report prepared by	Nigel Barker BA, MA, MCIfA (nigel@360hq.co.uk)

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CAD Drawings: 3948

Drawing Number	Paper Size	Scale	Title
3948-01	A3	Various	Site Location & Survey Extents
3948-02	A2	1:600	Magnetic Greyscale Data
3948-03	A2	1:600	Magnetic Interpretation

2 Executive Summary

This report presents the results of a geophysical survey undertaken at Harlech, Gwynedd, LL46 2NZ.

A magnetic survey covered approximately 0.8ha of pasture located over land east of the A496, north of Harlech Castle.

The survey detected bipolar linear anomalies likely to be associated with metallic service pipes. High value dipolar spikes were also present that are likely to originate from buried ferrous metal or burned material, along with weaker spreads of magnetic disturbance. The magnetic enhancements could be archaeological when associated with known anthropogenic features, however given the lack of context to any known archaeology it is unclear if these anomalies hold any relevance.

3 Introduction

A geophysical survey was commissioned at Harlech, Gwynedd by Gwynedd Archaeological Trust, in support of a consultation for a proposed residential development. The survey area comprised 1 field measuring approximately 0.8ha. The extents are shown in blue within the boundary plan below.



Ordnance Survey Data © Crown copyright and database right 2022

3.1 Location and land use

The location and scaled survey areas are shown in drawing 3948-01.

NGR Centre	SH 58231 32004
Postcode	LL46 2NZ
HER/SMR	Archwillio Gwynedd
HER Number	N/A
Period	N/A
District	Gwynedd
Parish	Llandanwg

Area	Hectares	Topography & Notes	Land Use
1	0.80	Western section of a large field. The survey area is level and bounded by an earth bank in the east that curves towards an access gate along the western boundary. Post and wire fencing is present along the south and west boundaries with open field to the north. Common gorse shrubs occur along the field boundaries and the earth bank. Wooden utility poles holding electric power cables are in place running north to south, parallel to the earth bank and across the northern most extent of the survey area. Metallic inspection covers in the southwest corner of the field are likely to be associated with buried water apparatus.	Pasture

3.2 *Aims and objectives*

The key aims and objectives of the geophysical survey are to establish the extent to which potential archaeological remains survive at the location of the planned scheme.

It was proposed that magnetometry would be used as a primary, rapid reconnaissance technique, to locate any buried archaeological features within the survey areas. Any anomalies likely to be anthropomorphic could then be targeted intrusively, if required. A detailed magnetometer survey has the potential to identify targets with enhanced magnetic susceptibility such as ditches, pits, former field systems and palaeochannels. Fired structures such as hearths, kilns and ovens and accumulations of ferrous metal within the sub-surface can be detected using this technique.

The success of the magnetic survey in locating archaeological features is dependent upon a measurable contrast between the anomaly and the surrounding ground. Not all surveys produce good results, given buried features can be masked by large magnetic variations in the geology or soil. In some instances, there may be little variation between the topsoil and subsoil resulting in undetectable buried features. The presence of ferrous metals, made ground and modern burnt remains will all produce strong responses that can obscure the presence of sub-surface archaeological features.

3.3 *Site history*

A desk-based assessment (DBA) was not available at the time of the fieldwork, however there are no known archaeological assets within the proposed development site. The regional Historic Environment Record (HER) list mostly farmsteads within the local area. Harlech Castle is sited less than a kilometre south of the proposed development. Both parish tithe records and Ordnance Survey maps show limited change in the field patterns between the late nineteenth and early twentieth century with some boundary reorganisation and the addition of field drainage made later.

3.4 *Geology and soils*

The underlying geology of the survey area comprises Harlech Grits Group – Sandstone, siltstone and mudstone (grey in Figure 1). This is a Sedimentary bedrock formed between 526 and 499 million years ago during the Cambrian period. The superficial deposits comprise Blown Sand, sedimentary deposits formed between 2,588 million years ago during the Quaternary Period and the present (British Geological Survey: 2022). Magnetic surveys are considered suitable for such geologies.



Figure 1 (www.bgs.ac.uk)

3.5 *Dates and additional information*

The geophysical survey was undertaken on days between 5th and 6th December 2022, under fine weather conditions.

4 **Field Methodology**

4.1 *Technique*

A detailed magnetic survey was undertaken as the most appropriate means of assessment. Magnetometers detect small variations in the Earth's magnetic field to locate buried anomalies associated with human activity. Usually, the topsoil will contain increased ferrous minerals compared to that of the sub-soil, caused by a complex fermentation effect and will have a higher magnetic susceptibility in non-igneous geologies. Under suitable ground conditions, features cut into the sub-soil that are later backfilled or gradually silted up, will be shown to contain a greater amount of iron material, and will be magnetically enhanced in comparison to the sub-soil. Strong magnetic readings can also be produced by archaeological features such as kilns, ovens, hearths, and destructive burning that all

acquire a thermo-remnant magnetic field upon cooling and a permanent magnetic signature within the subsurface.

The survey was undertaken in accordance with Historic England (2008) Guideline No 1, Geophysical survey in archaeological field evaluation, and the Chartered Institute for Archaeologists (2014), Standard and guidance for archaeological geophysical survey.

4.2 *Geomatic referencing*

The survey control was predefined in AutoCAD prior to the commencement of the fieldwork using topographic drawing *'Harlech Topo.dwg'*. Base lines were plotted within the field to ensure even data coverage. The grid points associated with the base lines were exported from CAD then imported into a Trimble R12 Global Positioning System (GPS). This instrument was used to set out the grid points within the field using bamboo flags as non-magnetic markers. Survey tapes were used for heading and positional referencing, ensuring that the data coverage would be comprehensive.

4.3 *Instrumentation*

A SENSYS MAGNETO MX PDA 5 channel survey platform was used for the detailed area gradiometer survey. The platform was GPS enabled using a mounted Trimble R12 antenna and hosted five FGM650/3 sensors spaced 0.5m apart.

4.4 *Data Collection*

The data was logged by a field computer mounted on the platform running MonMX Software. The software stored a GPS position every second from the NMEA stream with the gradiometer sensor readings recorded at 100Hz. The platform was pushed by the operator in straight traverses using the baselines for heading references.

To prevent drift within the data from external influences such as diurnal temperature changes, the system was stabilised within a magnetically quiet area prior to the data collection.

4.5 *Post-processing*

The data collected using the multi-sensor platform was prepared for export using SENSYS DLMGPS software. The system geometry was revised, and the results exported as a suitable .XYZ file for importation into Terrasurveyor 64 v.4.0.5.3 software for further processing, interpretation and presentation.

Processing was kept to a minimum to prevent the creation of artificial artefacts in the data. The processing involved:

- Base Parameters – adjustments made to set the X&Y interval of the interpolated data and the density of points used for the data sets.
- De-stripe – applied to compensate for drift that occurs between the sensors.
- De-stagger – applied to compensate for heading errors caused in GPS cart-based systems by mechanical errors in the recording triggering system.

The data was clipped at a level deemed appropriate to best show any possible anomalies and exported as processed greyscale images.

The final raster images were loaded into CAD software, where they were geo-referenced and used for interpretation.

4.6 *Data presentation*

The magnetic data results are presented as a 1:600 grayscale data plot in drawing 3948-02.

4.7 *Archive*

360 Archaeology & Heritage LTD hold a full in-house digital archive resulting from the project including all raw and processed data, geomatics, plans, documents, and written material.

5 **Results**

The results of the gradiometer survey are a representation of the measured values of the subsurface, shown in drawing 3948-03. The success of a magnetic survey detecting archaeological features is largely dependent upon a measurable contrast between the buried feature and the surrounding ground. Where anomalies cannot be associated with known features from existing source material, they will be interpreted as either probable or possible archaeology. Probable archaeology will be based on strength of response, typology and the relationship to known archaeology. Possible archaeology will usually be of poor anomaly definition and not supported by other data.

5.1 *Categories of Interpretation (Drawing 3948.03 Key)*

Interpretation Category	Description
Probable Archaeology	Anomalies that are likely to be archaeological due to the strength of response, typology or are corroborated by other source materials.
Possible Archaeology / Weak Responses	Anomalies that could be archaeological, usually with a low magnetic response, fragmented and not corroborated by other source materials.
Undetermined Responses	Anomalies that are usually fragmented or lack a defined morphology to be readily defined as anthropogenic. Could also be associated with modern features or changes in the underlying geology or topography.
Known Buried Field Boundary	Anomalies that are likely to be from former field boundaries and that are usually corroborated by historical mapping.
Possible Buried Field Boundary	Linear and curvilinear anomalies that are weak, fragmented or not corroborated by historical mapping.
Magnetic Disturbance / Iron Spikes	Usually dipolar and associated with ferrous metal or thermoremanent materials present within the sub-surface. Normally derived from tipped materials but also cultural

	noise from metallic features on the surface. Accumulations of igneous rock can also produce similar responses. Could be of interest when associated with probable or known archaeological features.
Natural Buried Features	Broad magnetic responses within the subsurface, likely to be associated with variations in the underlying geology, alluvial deposits, palaeochannels or a change in topography.
Cultural Magnetic Spread	Very strong responses possibly from thermoremanent magnetisation or accumulations of ferrous metal from tipped materials, night soil or ash accumulations from human occupation, agriculture or industry. Spread could be archaeological when associated with known archaeological sites or corroborated by source material.
Ridge & Furrow Cultivation	Broad, parallel linear anomalies, likely to be associated with ridge and furrow cultivation using non-reversible ploughs.
Agricultural (Modern)	Narrow, parallel responses common with modern ploughing techniques.
Field Drainage	Parallel, linear responses associated with surface water drainage. Positive responses are usually from vitrified clay pipes with weaker and negative responses associated with plastic pipes within cut trenches and gravel filled channels.
Buried Utilities	Linear features likely to be associated with buried metallic pipes or cabling, usually having a characteristic repetitive positive/negative bipolar signature.

5.2 *Probable & Possible Archaeology*

No probable or possible archaeological anomalies were identified within the magnetic data.

5.3 *Cultural Magnetic Spread*

Several areas of cultural magnetic spread are evident within the data. It is possible that the responses may be attributed to tipped materials and contain isolated, high value dipolar spikes. Given the lack of context to any known anthropogenic features of note, it is unclear if these anomalies have any archaeological potential.

5.4 *Undetermined Responses*

Two linear magnetic enhancements were detected in the southwest of the survey area. They are fragmented and correlate with the foot of the earth bank, therefore it is uncertain if they are of any relevance.

5.5 *Magnetic Disturbance / Iron Spikes*

The isolated dipolar iron spikes within the data have high magnetic values and are likely to correspond to near-surface ferrous or burned materials. Many are in excess of 200nT, however given the lack of context to any identified anthropogenic features of note, it is unclear if these anomalies have any archaeological potential.

5.6 *Buried Utilities*

Bipolar linear responses likely to be buried metallic utilities are evident within the data. One of the linear features runs close to the southern field boundary, curving round past the metallic inspection covers before continuing north adjacent to the western boundary. A second linear feature is in the far north of the survey area and runs in an east-west orientation that could be teed off from the main run.

6 **Conclusions**

The magnetic data was dominated by bipolar linear anomalies likely to be associated with metallic service pipes. High value dipolar spikes were also present that are likely to originate from buried ferrous metal or burned material, along with weaker spreads of magnetic disturbance. The magnetic enhancements could be archaeological when associated with known anthropogenic features, however given the lack of context to any known archaeology it is unclear if these anomalies have any relevance.

As with all geophysical investigations, the results presented are not infallible and are derived from data that is representative of the ground conditions at the time of the survey. Where possible, the magnetic data should be used in conjunction with supporting evidence and resources to corroborate or eliminate the findings.

7 References

- Historic England (English Heritage 2008) *Geophysical Survey in Archaeological Field Evaluation. Research and Professional Services #1.*
- Institute of Field Archaeologists (2002) IFA Paper No 6, *The use of geophysical techniques in archaeological evaluations.*
- European Archaeological Council - EAC Guidelines 2 (2015) *Guidelines for the use of Geophysics in Archaeology: Questions to Ask and Points to Consider.*
- Chartered Institute of Archaeologists (2014) *Standard and Guidance for Archaeological Geophysical Survey.*
- British Geological Survey – Geology of Britain Viewer - www.bgs.ac.uk
- Cover: Ordnance Survey – OS One-Inch Revised New Series - Sheet 135 – Harlech (Hills) – Scale one inch to the mile: 1899.

8 Appendix 1

9 Detailed Magnetic Survey

9.1 *Theory*

A detailed magnetic survey involves the detection of small variations in the Earth's magnetic field to locate buried anomalies associated with human activity. Usually, the topsoil will contain an increased amount of ferrous minerals than that of the sub-soil, caused by a complex fermentation effect and will have a higher magnetic susceptibility in non-igneous geologies. The action of digging a ditch or excavating a floor can expose the sub-soil layer that can be filled with debris or topsoil as they are in-filled or silted up. The features will then be magnetically enhanced in comparison to the sub-soil. The strength of the anomaly detected by the instrumentation is largely dependent upon the measurable contrast between the buried feature and the surrounding material.

In addition, the action of heating weakly magnetic compounds will convert them to oxides that are demagnetised as they reach their relative Curie temperatures. When cooled they become permanently magnetised and aligned with the geomagnetic field present at the time of heating, which is generally greater than the ground that has not been exposed to the high temperatures. This process is referred to as thermoremanence and can be indicative of human activity as kilns, ovens, hearths, and destructive burning will all leave a permanent magnetic signature within the subsurface.

9.2 *Instrumentation*

Fluxgate gradiometer instruments are commonly used for magnetic surveys. They have two vertically positioned sensors that have a separation of between 0.5m – 1.0m. Both sensors measure the Earth's magnetic field, however the bottom sensor will be affected by local variations in the field created by weakly magnetised buried features. To determine the strength of the buried anomaly, the value of the top sensor is removed from the value of the bottom sensor. This is the magnetic gradient and is measured in nanoteslas (nT). The readings are instant and shown in real-time on a display built into the instrument and can also be stored in an internal logger. 360 Archaeology & Heritage LTD will use either a Bartington Grad 601-2 fluxgate gradiometer or a SENSYS MAGNETO MX PDA 5 channel survey platform to undertake magnetic surveys.

9.3 *Survey Method*

9.3.1 *Gridded Survey*

An orthogonal grid system is used for the gradiometer survey and is established using either a 1-person robotic total station or a Global Positioning System (GPS) instrument. For surveys covering large areas, the grid will be drawn in CAD software and overlain onto Ordnance Survey digital data to be used as a backcloth for the co-ordinates. The co-ordinates can then be transferred to the survey instrument prior to arrival on site. For small areas, a local grid can be established on site to ensure a best fit. If a local grid is used then survey stakes will be established around the perimeter of the survey area. This will ensure that the co-ordinates of any detected anomalies can be easily targeted at a later date.

Each grid square will measure either 20m or 30m. The size used is dependent upon the size and shape of the survey area. Trapeze ropes are used by the operator as a reference for both positioning and heading.

A base point with a stable magnetic background will be established either within the survey area or external to it dependent upon ground conditions. The instrument will be balanced from this point and checked regularly for drift. Readings will be taken using the 0.1nT range every 0.25m over 1m traverses.

9.3.2 GPS Enabled Survey Platform

A multi-channel survey platform will be used for the GPS enabled surveys. The platform will comprise of a mounted GPS antenna along with several gradiometer sensors that are mounted on a non-magnetic cart. The data is collected by a field computer mounted on the platform, the software recording a GPS position every second from the GPS NMEA stream along with the sensor readings. The platform is pushed by the operator in straight traverses using the baselines for heading references.

To prevent drift within the data from external influences such as diurnal temperature changes, the system is stabilised or balanced within a magnetically quiet area prior to data collection, dependent upon the type of system used.

9.4 Data Processing

The data from the instrument will be downloaded during a midday interval and at the end of the shift to monitor quality and the progress of the survey. Data collected by the multi-sensor platform will be prepared for export using bespoke software to revise the system geometry. The composite file will then be exported as a suitable file format. The data will be post-processed in bespoke software to produce a greyscale interpretation of the readings. An X-Y trace map will also be produced to aid interpretation. The maps are imported into CAD software as raster images to produce interpretation and data presentation drawings. A report will also be produced to accompany the drawing.

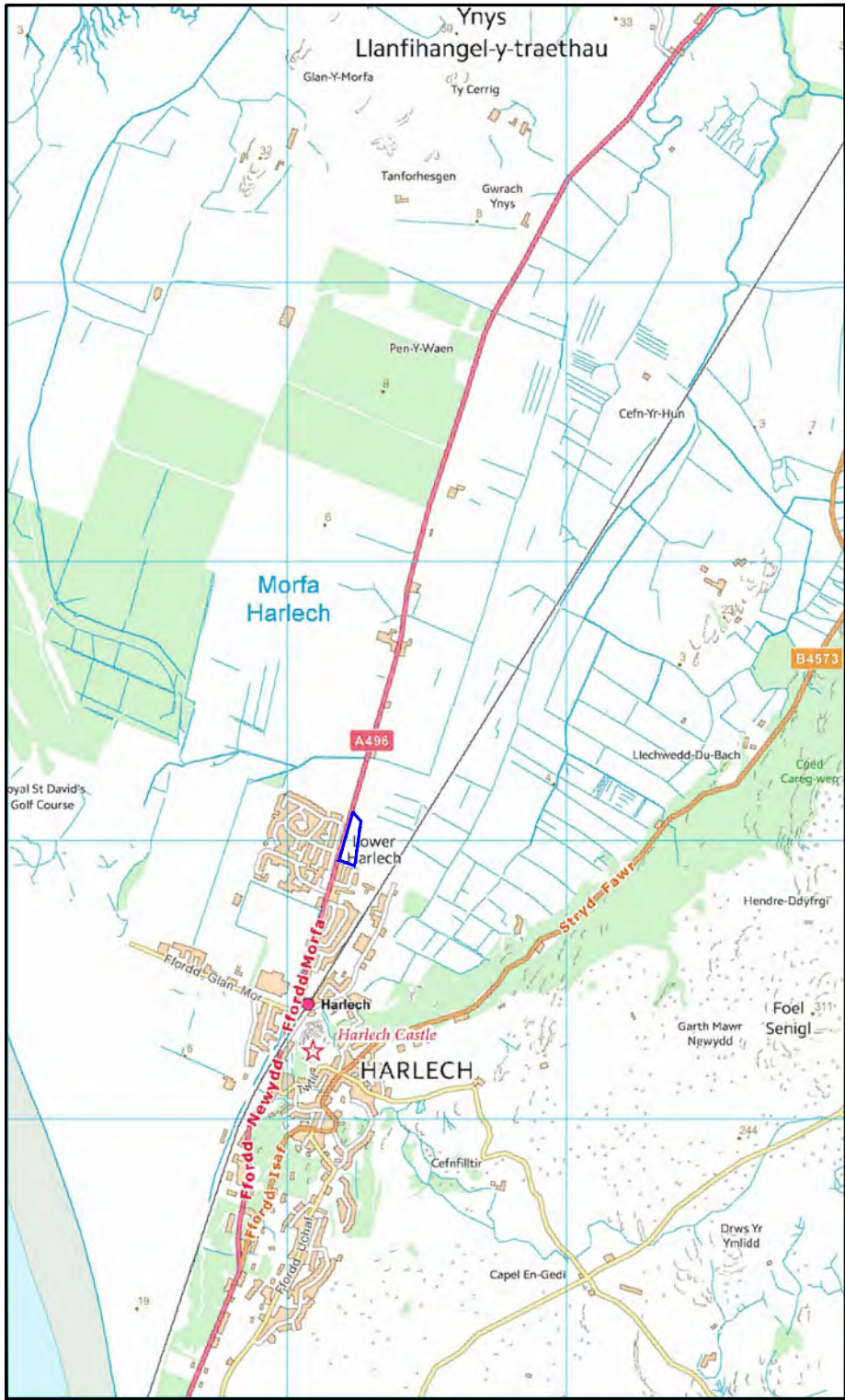
9.5 Limitations

The success of a magnetic survey detecting archaeological features is dependent upon a measurable contrast between the anomaly and the surrounding ground. The presence of made ground, ferrous debris and burnt materials can all produce strong responses that can mask the presence of buried archaeological features. It is therefore not possible to guarantee that all sub-surface features will be identified by a geophysical survey.

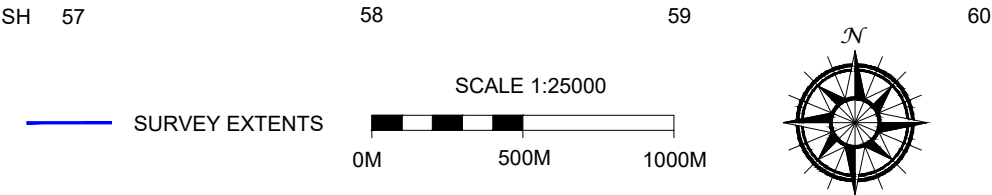
Surface features such as buildings, metallic fencing, vehicles, electricity pylons and wind turbines can also have an impact on the magnetic data due to the sensitivity of the instrumentation. An attempt can be made to remove the magnetic disturbance by post-processing the data in bespoke software, but this cannot reliably be used to detect underlying anomalies and could create false artefacts within the data itself.

Natural sub-surface processes can also produce anomalies that may be mistaken for archaeological features, such as fluvial deposits or the accumulation of sediments in areas prone to flooding. Alternatively, igneous geologies can make it difficult to detect cut features in the sub-surface as there is minimal contrast between the topsoil and sub-soil.

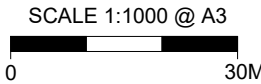
The quality of the data is also reliant upon the operator of the instrument. The data is collected at normal walking pace; therefore, it is advantageous for the ground surface to be even and unobstructed. Overgrown land, roughly ploughed fields and heavily saturated ground can all affect the pace of the operator and movement of the instrument sensors that in turn can produce heading errors and false artefacts in the data. In some instances, it may not be possible to undertake the survey until ground conditions are more favourable. Generally, gradiometer sensors can identify anomalies at a depth of approximately 1.0m dependent upon the strength of the buried feature. Beyond this depth, only large accumulations of thermoremanent materials or ferrous metal will be detected.



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--- SURVEY EXTENTS



SITE LOCATION



360 ARCHAEOLOGY

UNIT 3, MANDALE PARK, NORTH SHIELDS,
TYNE & WEAR, NE29 7FN

0191 594 7672
ADMIN@360HQ.CO.UK
WWW.360HQ.CO.UK

Client Name

Gwynedd Archaeological Trust

Job Title

Harlech
Gwynedd

Drawing Title

Site Location & Survey Extents

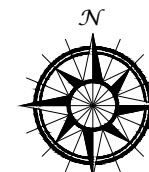
Scale As Shown

Drawn NB

Date 06/12/22

Approved PH

Revision	Amendments	By	Checked
3948	01	-	Final
Project Number	Drawing No.	Revision	Status



Direction of North based upon
client drawing 'Harlech Topo.dwg'

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nT



Drawing to be used in conjunction with report 3948



360 ARCHAEOLOGY

UNIT 3, MANDALE PARK, NORTH SHIELDS,
TYNE & WEAR, NE29 7FN
0191 594 7672
ADMIN@360HQ.CO.UK
WWW.360HQ.CO.UK

Client Name

Gwynedd Archaeological Trust

Job Title

Harlech
Gwynedd

Drawing Title

Magnetic Grayscale Data

Scale 1:600 @ A2

Drawn NB

Date 06/12/22

Approved PH

Revision

Amendments

By

Checked

Project Number

3948

Drawing No.

02

Revision

-

Status

Final



Gwynedd Archaeological Trust
Ymddiriedolaeth Archaeolegol Gwynedd

Craig Beuno, Ffordd y Garth, Bangor, Gwynedd. LL57 2RT
Ffon: 01248 352535. Ffacs: 01248 370925. email: gat@heneb.co.uk

