1790

Chwarel Penrhyn, Bethesda
Penrhyn Quarry, Bethesda

Arolwg a chloddio archaeolegol
Archaeological survey and excavation

Cynllun Prosiect Ôl-Gloddio
Preliminary Report and Post-excavation Project Design

Heneb

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Yr Amgylchedd Hanesyddol yn Cofnodi Prif Gyfeirnod /
Historic Environment Record Event Primary Reference Number 46653

Rhif Prosiect / Project No. G2534/HD24-001

Rhif Adroddiad / Report No. 1790

Wedi'i baratoi ar gyfer / Prepared for: Breedon Group/Welsh Slate Limited

Mis Hydref / October 2024

Ysgrifenwyd gan / Written by: Jane Kenney

Darluniau gan / Illustrations by: Jane Kenney and Neil McGuiness

Delwedd clawr blaen / Front Cover image:
Golygfa o'r awyr o gorlan ddefaid (PRN 29989) a phadogau hynafol (PRN 5380) o'r gogledd yn dangos eu lleoliad mewn perthynas â Chwarel Penrhyn (G2534_UAS_0897)
Aerial view of sheepfold (PRN 29989) and ancient paddocks (PRN 5380) from the north showing location in relation to Penrhyn Quarry (G2534_UAS_0897)

Heneb: Ymddiriedolaeth Archaeoleg Cymru

Heneb yw'r enw masnachu Ymddiriedolaeth Archaeolegol Cymru

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Heneb: Trust for Welsh Archaeology

Heneb is the trading name of The Trust for Welsh Archaeology

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Originated by	Document Author	Jane Kenney		26/09/2024
Reviewed by	Document Reviewer	Stuart Reilly		02/10/2024
Approved by	Principal Archaeologist			

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

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CRYNODEB ANNHECHNEGOL

Comisiynodd Grŵp Breedon / Welsh Slate Limited, Heneb: Archaeoleg Gwynedd i gynnal lleihau archaeolegol mewn ffurf cofrestru o olion gorfforedig a chloddfa targed cyn ail-drefnu'r chwarel yn Chwarel Penrhyn, Bethesda. Mae'r safle wedi'i ganoli ar CC SH61146396, a chafodd y gwaith maes ei gynnal rhwng yr 29ain a'r 31ain o Awst 2023, a rhwng 15fed o Ebrill a'r 28ain o Fai 2024. Arweiniodd y gwaith at gofrestr fanwl o corlan sawl cell ac olion gorfforedig cyfres o hen padogau. Dangosodd y chloddfa targed adeiladu waliau'r padog, ond ni chafwyd unrhyw dystiolaeth o aneddle. Mae'n ymddangos bod y padogau wedi bod ar gyfer rheoli anifeiliad ac o ryw bellter oddi wrth unrhyw gymdeithas gyfoes. Y darganfyddiad mwyaf pwysig yw'r ffwrnais bloomer gyda pwll sorod o fewn gorsaf gerrig crwn. Nid yw dyddiad y ffwrnais yn hysbys eto, ond efallai o gyfnod Rhufeinig neu canoloesol canol. Roedd y canfyddiadau'n cynnwys symiau o slag, offer carreg a fflochen flint. Mae Cynllun Prosiect Ôl-gynaeafu yn cynnig argymhellion manwl ar gyfer gwaith pellach.

NON-TECHNICAL SUMMARY

Breedon Group/Welsh Slate Limited commissioned Heneb to undertake archaeological mitigation in the form of a record of upstanding remains and a targeted excavation in advance of quarry realignment at Penrhyn Quarry, Bethesda. The site is centred on centred on NGR SH61146396 and the fieldwork was undertaken on 29th to 31st August 2023 and between 15th April and 28th May 2024. The work resulted in a detailed record of a multi-cellular sheepfold and the above ground remains of a series of ancient paddocks. The targeted excavation revealed the construction of the paddock walls but no evidence of settlement. The paddocks appear to have been for livestock management and at some distance from any contemporary settlement. The most significant discovery is the bloomery furnace with a slag tapping pit within a circular stone shelter, the date of which is not yet known but possibly Roman period or early medieval. Finds included quantities of slag, a stone tool and a flint flake. A Post-excavation Project Design provides detailed recommendations for further work.

1 INTRODUCTION

Heneb: The Trust for Welsh Archaeology (previously Gwynedd Archaeological Trust (GAT)) was appointed by *Breedon Group/Welsh Slate Limited* to conduct an archaeological mitigation in advance of quarry realignment at Penrhyn Quarry, Bethesda. The realignment comprises a c.6.4ha extension to the existing Penrhyn Quarry incorporating an area of upland to the south-west of the current workings (centred on NGR SH61146396; Figure 01). The archaeological mitigation was preceded by a series of evaluation trial pits and test trenches excavated by Heneb (Reilly 2018, GAT Report 1423), and by a geophysical survey conducted by Tigergeo (Roseveare 2017).

The archaeological mitigation was to comprise:

1. A record of a post-medieval multicellular sheepfold (PRN[1] 29989) and various paddocks/enclosures and possible roundhouses that comprise a possible late prehistoric settlement (PRN 5380).
2. A targeted excavation incorporating an oval-shaped paddock (PRN 60376), the associated possible house structure (PRN 60378), and the eastern end of the adjacent paddock/enclosure (PRN 60375).
3. An archaeological watching brief will be conducted during the soil strip of the quarry extension.

This report covers the first two of these actions. The watching brief is still to take place and will be included in a separate report.

The targeted excavation was undertaken in accordance with the following guidance:

- *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs) Version 2 (The Welsh Archaeological Trusts, 2022).*
- *Standard and Guidance for Archaeological Excavation (Chartered Institute for Archaeologists, 2020a).*
- *Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives* (Chartered Institute for Archaeologists, 2020b).
- *Management of Archaeological Projects* (English Heritage, 1991).

[1] Primary Record Number for the HER

- *Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide* (Historic England, 2015).
- *Guidelines for digital archives* (Royal Commission on Ancient and Historic Monuments of Wales, 2015).

The archaeological mitigation was undertaken in accordance with an approved Written Scheme of Investigation (WSI) (Appendix IV). In line with the Gwynedd Historic Environment Record (HER) requirements, the HER was contacted at the onset of the project and HER Enquiry Number **GATHER1879** and the Event PRN **46653** were assigned. The work was monitored by Heneb Planning (formerly Gwynedd Archaeological Planning Service).

Aims and Objectives

The key aims and objectives were to:

- fully record the upstanding remains of the late prehistoric settlement (PRN 5380) and multicellular sheepfold (PRN 29989).
- locate the source of the iron slag uncovered in test pit 18 and determine if a furnace is present within this part of the settlement.
- to expose and characterise all archaeological activity within the area of excavation.
- establish the date and nature of any archaeological remains identified within the targeted area of excavation and assess their implications for understanding the development of the site, in conjunction with the known archaeological record.
- place the results in context, with reference to *A Research Framework for the Archaeology of Wales Version 03, Final Refresh Document* (March 2017).

Acknowledgements

Heneb: The Trust for Welsh Archaeology would like to thank the following for their contribution and support:

- *Heneb Project Team:* Stuart Reilly, Neil McGuiness, Bethan Jones, Jane Kenney, Jessie Baumgardner, Anne Marie Oattes, Mike Tunnicliffe and Stuart Murphy.
- *Client:* Breedon Group/Welsh Slate Limited: Erwyn Jones, Rob Whalley and Shaun Denny

- *Heneb Planning*: Jenny Emmett.
- *RG Hire Limited*.
- *Stermat Car and Van Rental*.

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

2.1 Location and Geology

See Figure 01

Penrhyn Quarry lies within the Dyffryn Ogwen Landscape of Outstanding Historic Interest: 28 (Cadw 1998, 105-108) and forms one of the essential elements of this landscape. Dyffryn Ogwen divides the Carneddau from the Glyderau mountain ranges and the quarry lies where the valley opens out on to the Arfon coastal plain. As well as the extensive industrial archaeological remains that exist within the locality, mainly associated with the extraction of slate, the uplands around Bethesda and Nant Ffrancon contain extensive and well-preserved remains of prehistoric and later land use.

The archaeological mitigation was conducted in an area to the immediate south-west of the existing Penrhyn Quarry works (Plate 01). The area in question is situated at a height of about 370m OD on the southern side of Gwaen Gynfi, a large expanse of mostly unenclosed peat bog to the south of Mynydd Llandegai (Plates 02 and 03). The bog drains into the Afon Marchlyn Mawr which in turn runs into the Galedffrwd, a tributary of the Ogwen. The borders of the bog adjoining the quarry are better drained and consist of natural terraces and boulder fields (Hopewell 2009). Overlooking the area to the south-east is Y Fronllwyd (721m high) (Plate 04), with behind it Carnedd y Filiast (821m high), forming the north-western end of the Glyderau Range.

The Penrhyn Slate Quarry targets the Llanberis Slates Formation, sedimentary bedrock formed between 526 and 508 million years ago during the Cambrian period. However, the archaeological mitigation area, lying on the edge of the quarry, is on the Padarn Tuff Formation, an igneous bedrock formed between 635 and 541 million years ago during the Ediacaran period (BGS Geology Viewer). The superficial geology is more important in defining the character of the environment than the bedrock. Over the bedrock is Devensian till formed between 116 and 11.8 thousand years ago during the Quaternary period (BGS Geology Viewer). This includes boulder clays but also boulder fields lying on top of the boulder clay. These periglacial boulder fields form scarps up to 5 metres high and natural well-drained terraces. The boulder fields are composed of boulders and deposits that moved down slope from the higher ground of Y Fronllwyd and Carnedd y Filiast during the later Quaternary period. Some of the boulders are conglomerates, presumably from the Carnedd y Filiast Grit, which includes sandstones and conglomerates, but much of the stone is probably from the Bronllwyd Grit Formation, with little slate visible.

2.2 Archaeological background

Based on Hopewell 2009.

See Figure 01

A cairnfield (PRN 5671) consisting of 44 grassed over cairns, possibly dating from the Bronze Age, lies in the northern part of Gwaen Gynfi. Cairnfields are often assumed to be the result of field clearance, but their density and the presence of kerbs suggest they are Bronze Age burial cairns. A stone cist was found in one when it was excavated in the 19th century (Caffell 1988) again suggesting burial cairns. The enclosures and other features within the area currently investigated are listed in the Historic Environment Record (HER) as a prehistoric settlement (PRN 5380), and in addition to this there are at least two other huts circles and associated features recorded on the edge of the quarry to the north of the present site (PRNs 5670 and 12195). There is also an isolated hut circle (PRN 12638) adjacent to Mynydd Llandegai. Two further areas of wandering wall and miscellaneous structures may also indicate less well-preserved settlements (PRNs 12430 and 12500). Hut circle settlements are usually dated to the Iron Age or Romano-British period although upland settlements of this type may date from the Bronze Age.

The fragmentary foundations of a rectangular building close to the target excavation may be a medieval hafotty (upland summer dwelling) (PRN 12327), and a trackway (PRN 12328) running next to it may be associated with it. A sheepwash (PRN 12384) on the Afon Marchlyn-mawr is built over an earlier structure that may be medieval in date.

There has been quarrying in this area since at least 1413, but the present quarry was established from 1782 when Richard Pennant bought out the existing leases and the Penrhyn estate embarked on a rapid expansion of the slate quarrying industry. Quarrying methods were improved in 1798 by an innovative gallery system where the working face was terraced at regular intervals allowing large numbers of men to work simultaneously. The slate was initially transported to a small quay at the mouth of the river Cegin by wagons. This was upgraded in 1801 with the construction of a horse-drawn tramway running to a new quay at Port Penrhyn, and steam locomotives were introduced in 1876. Expansion continued throughout the 19th century and the quarries at Penrhyn and Dinorwic dominated the industry. This in turn led to the development of the communities of Bethesda, Llandegai, Mynydd Llandegai, and Tregarth.

Extraction has continued throughout the 20th century with expansion to the south-west towards Gwaen Gynfi following a deep vein of high-quality slate towards Marchlyn and Dinorwic. Gwaen Gynfi retains several features relating to the early years of the quarry. Llyn Owen y Ddol was constructed in the early 19th century to provide water for the quarry. Its original edge

is marked by a bank to the east (PRN 12194). It was fed by three leats (PRNs 12196, 12272 and 12446). The latter is a 1.1km construction, now dry, running from Marchlyn Mawr. Another reservoir Llyn-y-mynydd, to the south of Mynydd Llandegai, is now dry. Three rock cannons (PRN 12639 and PRN 12640) are recorded at Gwaen Gynfi, one at the north and two at the south (Jones 2002, 95). A rock cannon or Cerrig Cannan is a rock or boulder which has been bored with holes which were loaded with black powder and ignited to make explosive sounds during celebrations. The bog at Gwaen Gynfi is designated a Turbary (i.e. an area of bog where people had rights to cut peat for fuel) on the 1823 Penrhyn Estate map and the disused peat cuttings can still be seen as stepped areas in the peat. This area was an important source of fuel up to the 19th century.

There are four ruined sheepfolds in and around Gwaen Gynfi probably of 18th or 19th century date. A complex multicellular fold (PRN 29989) is included in this study. PRNs 12640 and 12409 are both simple two-pen sheepfolds and 12384 is designed to allow sheep washing in a dammed pool in the Afon Marchlyn Mawr. A small enclosure PRN 12349 may also be a sheepfold.

2.3 Previous Archaeological Work

This area has previously been investigated by GAT in advance of an earlier phase of quarry realignment. An archaeological assessment of the proposed realignment zone was undertaken in November 2009 (Hopewell 2009, GAT report 837). The assessment identified a number of sites, the majority relating to a site interpreted as a late prehistoric settlement (PRN 5380) and a post-medieval multi-cellular sheepfold (PRN 29989). To better identify the significance of the archaeological remains and identify appropriate mitigation an archaeological survey and a phase of field evaluation was undertaken (Cooke and Davidson 2010, GAT report 880 and Davidson 2010, GAT report 899) in July and September 2010, respectively.

Figure 02 shows the features identified and surveyed during the desk-based assessment and archaeological survey. The reports used feature numbers to identify features, but these now all have Primary Record Numbers (PRNs), and the PRNs will be used to refer to the features in this text. Figure 02 has a table of feature numbers and PRNs. The survey identified a cleared terraced area (PRN 60386 (Feature 20)), a suspected prehistoric structure (PRN 60382 (Feature 16)), a possible burial cairn (PRN 12348 (Feature 15)), and a possible ruined hut circle with sheepfold rebuild (PRN 12349 (Feature 14)). The results of the evaluation proved the suspected prehistoric structure (PRN 60382) to be of natural origin and that there was no evidence that the sheepfold (PRN 12349) utilised an earlier hut circle. Evaluation trenches

showed that there were no buried remains present on the cleared terrace area (PRN 60386), and that this area had never been ploughed, showing that it was a natural terrace, not a lynchet. Evaluation did however show that a relatively complex level of archaeology was revealed at the possible burial cairn site (PRN 12348), and archaeological excavation of the entire feature was recommended. This excavation was completed in December 2012 (McNicol 2013a, GAT report 1105), and revealed a roughly rectangular stone structure, measuring approximately 7m by 5m, and aligned east-west. The date and function of this structure was uncertain, but given its shape and size, it was most likely the remains of a post-medieval peat and/or hay drying platform.

Two watching briefs were completed in areas to the northeast and southeast of Feature 12 in 2013 (McNicol 2013b, GAT report 1131) and 2014 (Gwynedd Archaeological Trust 2014, GAT report 1266) respectively. The watching briefs confirmed that the natural geology of the site was close to the surface, lying on average only 0.2m below ground level and consisting of a light orange sandy clay. A large number of natural sub-angular stones and boulders were located throughout the site, with only a few small patches being relatively stone-free. No archaeological features or deposits were uncovered during either of the watching briefs.

A programme of detailed recording and targeted trenching was complete across a trackway (PRN 12328 (Feature 12)) in 2015 (McNicol 2015, GAT report 1238). No evidence of any surface was uncovered, and it is likely that the trackway was created by the removal of stones along its length, and that the depth was due to the use of the trackway. No finds were uncovered during the excavation, and therefore a date for the trackway is uncertain. However, given the proximity to the possible medieval hafotty (summer upland dwelling) (PRN 12327 (Feature 13)) it is likely to be of a comparable date. Two further features (Feature 10 and 17) were fenced off to be avoided during the realignment works.

2.4 Recent Evaluation Work

The current proposed quarry realignment impacts on the remaining area of archaeological activity and a phased archaeological evaluation of the site was conducted by GAT in August and September 2017, and February 2018 (Reilly 2018, GAT Report 1423) and by a magnetometer survey conducted of the site by Tigergeo during October 2017 (Roseveare 2017). A watching brief was carried out on the stripping of a relatively small area in November 2017 (Reilly 2017, GAT Report 1410).

Stage 1 of the evaluation consisted of the hand excavation of six 5m by 0.80m test trenches and thirty 0.3m by 0.3m test pits. This confirmed the presence of drystone walls in Trenches 1

to 5 that uniformly consisted of locally sourced stones, most likely from field clearance, which were built on top of and between earthfast boulders to form rather sinuous, wandering boundaries that loosely defined paddocks/enclosures. There was no evidence for foundation cuts or any sealed horizons and in most cases the basal stones were set directly on top of earthfast boulders and/or the underlying natural clay. The one exception to this was Wall 604, which was built on top of the subsoil layer (602). No artefacts or ecofacts were retrieved from the trenches that could be used to aid the dating of these drystone walls.

Aside from the walls, there were no archaeological features or deposits found within the trenches. Most of the test pits did not produce archaeological material, the exception being test pit 18, located just outside a small circular structure, where a small quantity of iron smelting slag was recovered.

The subsequent magnetometer survey undertaken by Tigergeo aimed to locate possible iron production activity identified during the Stage 1 evaluation and buried features of archaeological interest. The survey identified a series of potential archaeological features, some of which were associated with the iron slag retrieved from test pit 18.

Stage 2 of the evaluation was conducted by GAT in February 2018. It was comprised of the hand excavation of four 3m by 0.80m test trenches and five 0.50m by 0.50m test pits, which targeted potential archaeological features identified in the magnetometer survey. The trenches and test pits revealed that the possible linear or structural features identified by the geophysical survey were actually geological in nature, typically being seams or concentrations of earthfast boulders. Test pit 31 was located immediately adjacent to test pit 18 but did not produce additional iron slag or material associated with it. Test pit 32 within the nearby circular structure identified a small pit with a fill that included charcoal and slag, and the underlying natural clay had been oxidised. This was interpreted as being related to iron smelting set within a rough shelter or a smithy.

A soil sample retrieved from the pit in test pit 32 was sent to AOC Archaeology Group for specialist assessment, and the slag was identified as being the result of ironworking from a bloomery furnace. The limited charcoal recovered from the sample was oak charcoal it was decided not to obtain a radiocarbon date due to the risk that this was heartwood and centuries older than the activity to be dated. The specialist assessment, therefore, identified the presence of a bloomery furnace in the area but did not provide a date or context for the activity. This highlighted to need for more extensive excavation as part of further mitigation.

3 METHODOLOGY

3.1 Introduction

The archaeological mitigation consisted of the following actions:

1. Record the post-medieval multicellular sheepfold (PRN 29,989) and the various paddocks/enclosures and possible structures that comprise the late prehistoric settlement (PRN 5380).
2. Targeted excavation incorporating the small, oval paddock (PRN 60376), the associated circular structure (PRN 60378), and the eastern end of the adjacent paddock/enclosure (PRN 60375).

An archaeological watching brief will be necessary during the soil strip when the quarry extension goes ahead. This report has been produced in advance of that watching brief.

3.2 Record of Upstanding Remains

The archaeological mitigation included recording the post-medieval multicellular sheepfold (PRN 29989) and the remnants of wandering drystone walls that define the enclosures, paddocks and other features that comprise site PRN 5380. This recording was done using photogrammetry to create plans of both elements of the site and elevations of the sheepfold and took place on 29th to 31st August 2023.

A DJI Phantom 4 Pro Plus v2.0 Quadcopter was used to take overlapping photographs of the entire area, with additional photographs taken with a handheld Nikon DSLR camera within the smaller cells of the sheepfold. Targets were laid out and surveyed in with the Trimble R8s GNSS Global Positioning System (GPS). The photographs were processed using the Agisoft Metashape photogrammetry program to create 3D models, which were georectified using the surveyed targets. From this data orthomosaics were produced, which are perfectly horizontal images exactly to scale and georectified. This resulted in a detailed landscape survey to complement the existing plans of the site and a detailed plan of the sheepfold. Elevations of representative parts of the sheepfold were extracted from the 3D model.

A version of the 3D model is available on Sketchfab to allow the public to view and study this.

https://sketchfab.com/3d-models/buarth-cerrig-gwynion-mynydd-llandegai-gwynedd-bc2d54e167f54efdbbae3d6db4a655f3

3.3 Targeted Excavation

3.3.1 Excavation

The targeted excavation covered the small, oval paddock (PRN 60376), the associated circular structure (PRN 60378), and the eastern end of the adjacent paddock/enclosure (PRN 60375), including possible stone structures (PRN 60387). These formed part of what was interpreted as a late prehistoric settlement (PRN 5380). A major aim was to locate the source of the iron slag found in test pits 18 and 32 and to determine if a furnace was present within that part of the settlement. The excavation was undertaken between 15th April and 28th May 2024.

The targeted excavation area was laid out in relation to the visible archaeology, using Fig 02 in the WSI as guidance, but defined by features on the ground and by the location of areas of boulders. The final outline of the targeted excavation area was surveyed using a Trimble R8s GNSS GPS (>1cm accuracy). The Trimble R8 unit was also used for all subsequent digital surveying.

Soil stripping was carried out using an 8 tonne 360° tracked excavator fitted with a toothless bucket (Plate 05). Soil was stripped by machine as far as the glacial horizon or an archaeological horizon or upstanding feature, whichever was encountered first. All boulders and large stones were left in place to avoid disturbance to stone archaeological features and to allow the extent and character of the natural boulder field to be recorded. Over the relict field boundaries and other archaeological features composed of stone deturfing was done using hand tools and the over-burden removed by hand to expose the stones (Plate 06). In the south-eastern corner of the targeted excavation area there were too many boulders to allow access by the machine without considerable disturbance, but stripping in the rest of the area suggested that there would be no buried archaeology in this area. The area would have taken a long time to deturf and strip by hand. It was agreed with Heneb Planning that this area could be left uninvestigated, though it was included in the detailed survey of the excavated area. The relict field boundary running through this area was also left unexposed, as sufficient of the boundaries had been exposed and recorded.

All attendances, subsurface activity, contexts records, registers of artefacts and ecofacts were recorded using GAT pro-formas. Topsoil, subsoil and the composition of the glacial horizon were recorded. All archaeological features and deposits encountered were manually cleaned and examined to determine extent, function, date and relationship to adjacent activity. Archaeological features and deposits were recorded by detailed notes, photography and hand drawn sections and plans where appropriate. Features and general deposits were located by

GPS, but detailed planning was carried out by photogrammetry and by one hand drawn plan. Hand drawn plans and sections were located by GPS. Photogrammetry orthomosaics, hand drawn plans and GPS survey data were combined in the post-excavation phase to produce the final plans of the site.

Photographic images were taken using D3100 camera set to maximum resolution (4608 × 3070) in RAW format with a photographic record maintained on site using GAT pro-formas and digitised in Excel as part of the fieldwork archive and dissemination process.

3.3.2 Artefacts and Ecofacts

All archaeologically significant artefacts were retained for further examination and identification. With the exception of iron smelting slag, very few artefacts were encountered. The slag was collected by hand the location of the finds recorded in three dimensions using the GPS equipment.

Bulk soil samples were taken from significant features where there was evidence of charcoal present or to recover small artefacts such as flint debitage or metal-working debris if these were suspected. The bulk samples were not less than 40 litres, or 100% if the feature was smaller. Samples were taken by GAT staff using 10 litre sampling buckets. The bulk samples will require processing using flotation and wet sieving. The resulting flots will need to be assessed and analysed for plant species and charcoal, with the results potentially providing agrarian practices and wood fuel use, as well as material for radiocarbon dating. The remaining coarse residue from the processing will need to be sorted to recover any artefacts.

The peat deposits encountered were considered to be too shallow and late to be worth sampling for pollen and other analysis, but a soil monolith was taken from a deposit sealed underneath circular structure 4008. Within this structure bulk soil samples were taken from an occupation deposit (4015) in each quarter of the structure and from each side of the entrance outside. This will allow some spatial control on the ecofacts recovered from the samples. In the same quadrants bags of soil were taken in case chemical analysis should be considered worthwhile.

3.4 Archive

3.4.1 Working Project Archive

Following the completion of the fieldwork, a working project archive was created based on following task list;

1. Pro-formas: all cross referenced and complete;
2. Photographic Metadata: completed in *Excel* and cross-referenced with all pro-formas;
3. Survey data: downloaded using a Computer Aided Design package;
4. Sections: all cross referenced and complete;
5. Plans: all cross referenced and complete;
6. Artefacts: quantified and identified; register completed;
7. Ecofacts: quantified and register completed;
8. Context register: quantified and register completed.

All relevant site archive data were added to a digital project register specific to this project and prepared in *Microsoft Excel.*

The site archive data was processed, final illustrations compiled, and the current report details and synthesises the results.

3.4.2 Data Management Plan

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 will be confirmed in an updated Selection Strategy document appended to the final report.

3.4.3 Selection Strategy

As defined in *Standard and guidance for the creation, compilation, transfer, and deposition of archaeological archives* (Chartered Institute for Archaeologists, 2020b) 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 Heneb Planning, client and/or landowner, and organisations with which the archive will be deposited), which will be applied to a Working Project Archive prior to its transfer into curatorial care as the Archaeological Archive.

A preliminary Selection Strategy has been provided in the WSI (Appendix IV). During the post-excavation phase of the project a final Selection Strategy will established in discussion with relevant parties. No up-dated Selection Strategy is therefore included with this report. The final Selection 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.

3.5 Dissemination and archiving

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

- A digital report to be provided to the client and Heneb Planning (draft report then final report).
- A digital report to be provided to the regional Historic Environment Record in accordance with the required standards set out in *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* (Version 2).

- A digital report and digital archive dataset to be provided to Royal Commission on Ancient and Historic Monuments Wales in accordance with the *RCAHMW Guidelines for Digital Archives Version 1*.
- Artefacts to be retained (see Selection Strategy) will be deposited with Storiel, Bangor as the most appropriate museum. The Accession Number is **2024/20**.

4 QUANTIFICATION OF RECORDS

4.1 Digital Archive

163 excavation photographs – NEF files converted to TIFFs

1146 images for excavation photogrammetry – jpg files

37 record shots of sheepfold – JPG files converted to TIFFs

3398 images for Record of Upstanding Remains photogrammetry – JPG files

1 site survey (combined survey data) – DWG file

13 scans of field drawings and annotated orthomosaics

5 scans of paper registers – PDF files

4.2 Paper archive

8 sheets day records

44 context sheets

2 sheets context register

1 sheet drawing register

1 sheet drawing sheet register

1 sheet sample register

4 sheets artefacts register

8 sheets photographic register

3 sheets site drawings on Permatrace

8 sheets annotated printouts of orthomosaics

4.3 Finds and Samples

Finds

See Appendix II for full list of finds.

1 stone tool

1 flint flake

Slag/ furnace lining and related material: total of 16.8kg in 114 bags

Samples

See Appendix II for full list of samples.

10 Bulk soil samples in 13 tubs

6 bags of soil for possible chemical analysis

1 soil monolith for possible pollen analysis

5 RESULTS

5.1 Introduction

The survey of the upstanding remains provided a detailed record of the multi-cellular sheepfold (PRN 29989) and of the earlier remains in the area as they appeared on the ground surface (Figure 03, Plate 07). These earlier remains comprise four enclosures or paddocks (PRNs 60373-6) defined by low, collapsed and largely robbed-out walls. Against the eastern side of paddock PRN 60376 was a circular stone structure (PRN 60378), and the south-eastern corner of paddock PRN 60375 was a large mass of stone (PRN 60387), suggested from previous investigation to be possibly two enclosures (Plates 08 and 09).

The targeted excavation covered the eastern part of paddock PRN 60375 and all of paddock PRN 60376. This revealed the structure of the paddock walls and allowed for possible entrances to be investigated. It fully exposed the circular stone structure (PRN 60378), revealing, inside the structure, the base of an iron smelting furnace with attached pit. The large mass of stone (PRN 60387) was also fully exposed and investigated but no evidence of built structures was identified, and this was seen to be essentially an exceptionally large clearance cairn.

The excavation used context numbers to identify the deposits and structures recorded. The context numbers started from 4001 to avoid duplicating numbers from the evaluation phase of the project. Group numbers were used to identify structures or potential structures with multiple elements; the circular stone structure PRN 60378 was Group number 4008, and the stone heap PRN 60387 was Group number 4010.

5.2 Upstanding and surface remains

5.2.1 Sheepfold (PRN 29989)

Figures 03-12

The sheepfold is roughly sub-square in layout, measuring about 29.5m by up to about 28m externally, with 17 cells around an almost square central pen (Figure 04, Plates 10 and 11). The cells have been numbered on Figure 04 to allow their identification; these numbers were used in the photographic record. The central pen measures about 13.0m by 12.5m internally and there are two very large boulders within it, with the wall being built running over one of the boulders (Plate 12, Figure 12). The sheepfold is located at the base of a natural scarp and follows the slope downhill with not terracing into the slope (see Figure 05 for profile). There is

a funnel-shaped entrance between the cells on the south-western side (Plate 13, see Figure 12 for elevation of inner end of entrance). The small cells are arranged radially around the central pen, with most having their shortest sides joining the central pen but Cell 12 runs length-ways along the side of the central pen and a small square cell (Cell 16) has been added between cells on the northern corner, then another cell (Cell 1) added on to that. Where the walls are well preserved it can be seen that the central pen was built first and that the walls of surrounding cells abut those of the central pen. The cells are generally rectangular in shape, up to 9m long internally and up to 4m wide, though Cell 6 is almost triangular with the longest side being about 7m long. This cell has a curving outer wall and some of the other cells have more or less curving walls, while others have entirely straight walls. This gives the sheepfold overall curved south and south-east corners.

Cell 17 was initially assumed to be an entrance, but part of the outer wall survives on the north-east side and presumably this originally extended across (see Figure 09). Part of this wall may have been deliberately removed to alter the function of this cell, as part of the inner wall of the cell seems also to have been removed. Cell 17 may have provided access to a small structure which seems to have been added in the south-eastern corner of the central pen, blocking the sheep creep from Cell 5 into the central pen. The interior of the small structure, which measures about 5m by 2m overall, is at the same level as the interior of the central pen and at a lower level than the adjacent cells (see Figure 11 for elevations). The structure is partially collapsed, and its interior is covered with large stones from the collapse of the adjacent pen wall (Plates 14 and 15), so its function is not clear, but it may have been a shelter for the shepherds.

In general, the walls of the sheepfold survive to about 1.5m high but many are much reduced by collapse (Figures 05-12). None of the walls have surviving coping stones. The stone used is from the surrounding boulder fields and includes boulders up to 1.5m long. While some of the boulders are *in situ* (Plate 16) some appear to have been moved and even laid on other stones to build the walls (Plate 17), requiring considerable skill in moving very heavy objects. The quality of the walling is generally rough with very loosely coursed walls. Though the best walls are relatively neatly constructed (Plate 18), some are very casually built, probably due to rapid rebuilding after a collapse (Plate 19).

The cells were accessed by sheep creeps, low entrances with a lintel carrying the wall over the top (Plate 20, Figures 05-12)). The highest of the sheep creeps is about 0.6m high (Plate 21). Most cells had access from the central pen and to the outside of the sheepfold, with sheep being moved from the central pen into the relevant cell and then released out of the fold once they have been sheared, sorted or otherwise managed. This required the sheep creeps to be

opened and closed, as necessary. The sheep creeps might be closed with a flat stone, as seen in Cell 7 (Plate 22), though most that have evidence of blocking have been blocked by a few smaller stones that could be easily removed as needed (Plate 23). Not all the sheep creeps to the exterior can be identified due to wall collapse, and the existence of a sheep creep from Cell 11 to the interior is similarly uncertain, but no sheep creep could be seen from Cell 8 into the central pen, although the wall is fairly well-preserved. The sheep creep from Cell 4 to the exterior is very low and largely blocked but seems to be genuine. Cell 3 has two sheep creeps into the interior, though one is almost entirely blocked and difficult to identify from in the central pen. Cells 9, 10 and 11 are linked by sheep creeps (Figure 10), showing that they belonged to the same farm and were used together. Cell 7 has a sheep creep into Cell 17, though as the latter was altered possibly to open directly to the outside, this sheep creep may have been inserted to lead out of the fold (Figure 09).

Running from the western corner of the sheepfold are the denuded remains of a wall about 4.6m long (Plate 24). This continues the same alignment as the end wall of Cell 12. There are perhaps the vaguest hints of a return heading south-east under the grass, and it seems probable that this is the remains of a larger cell that was halved in size to create the current layout.

5.2.2 Paddocks (PRN 5380)

Figure 02 shows the results of the previous survey over a wider area than the drone survey. The drone survey (Figure 03) provides more detail to add to the interpretation of the previous survey, allowing some features to be reinterpreted.

The paddocks lie on a natural terrace within the boulder fields beneath a 5m high natural scarp, at about 370m OD on a slope overlooking the bogland of Gwaen Gyfni. The area is well-drained and sheltered by the higher ground to the south and south-east. The multicellular sheepfold (PRN 29989) stands near the centre of the site. There are four enclosures or paddocks (PRNs 60373-6) defined by more or less wandering walls (Plate 08). The walls are no more than 0.3m high and consist of roughly piled stones linking *in situ* natural boulders (Plate 04). In places the interiors of the enclosures seem to be partially cleared of stone, though many stones and boulders do remain.

The south-western enclosure (PRN 60373) had a rounded western end, though this has largely been destroyed by a drainage ditch and track recently created by the quarry. This paddock measures about 54m in length and possibly 33m wide, though its southern side is largely defined by the natural scarp, so its width is hard to determine accurately. The western paddock

(PRN 60374) also has a fairly rounded western end, though this is rather fragmentary and difficult to follow on the ground. This paddock probably measured about 46m by 40m defined on the eastern side by a slight, largely buried wall. The north-western wall of this paddock continues to form the wall of the next paddock (PRN 60375). Within paddock PRN 60374 is a rough line of stones running west-south-west to east-north-east. This is about 17m long, but it is on a different alignment to the walls of the paddocks, and it is not very clear. It is possible that this is a natural line of stones that has formed within the boulder field, as was seen in the target excavation.

Paddock PRN 60375 measures about 46m by up to 49m. Its southern side is not defined by a wall, and it probably continued up to the base of the scarp, but its exact width cannot be determined. The wall between paddocks PRN 60375 and 60376 is a well-defined straight wall, and even on the ground surface there are indications of a gap within this towards its south-eastern end. This wall seems to be partially covered by the edge of the mass of stone (PRN 60387) in the eastern corner of this paddock (Plate 09).

The western paddock (PRN 60376) continues the alignment from PRN 60375, but there is a slight kink in the north-western wall suggesting that PRN 60376 might be an addition. The eastern wall of this paddock curves round and can be seen running along the natural scarp. A circular stone structure (PRN 60378) is clearly seen against or over the eastern wall of this paddock. This was investigated in detail in the target excavation.

Immediately north of paddock PRN 60376 is an area with relatively few stones defined by boulder fields. This measures about 22m by 13m and has previously been recorded as a paddock (PRN 60377), but there is little evidence that this was deliberately enclosed, like the four paddocks described above. It may have been improved by some stone being removed but this is largely a natural feature.

Two possible outlying paddocks (PRNs 60379 and 60380) to the north and north-west of the main paddocks are defined by natural scarps. There appears to have been some clearance here, with stones piled among the natural boulders on the edge of the scarp. There may also have been some clearance (PRN 60381) to the north-east where the stone appears to have been dumped among the natural boulders as opposed to have been made into wandering walls. While these areas may have been improved to some extent and used for grazing there is no evidence that they were enclosed by walls, and so were not paddocks like PRNs 60373-6.

A 1.5m wide meandering trackway (PRN 12305) (Site 11) has previously been recorded running through paddock PRN 60375. However, this did not seem to be convincing. The

proposed line follows occasional linear hollows within the boulder field, which appear to be entirely natural, and runs through what, on the surface, appeared to be a gap in the paddock wall. The excavation showed that this gap was not real, and no trace of this trackway was seen in the excavation. The supposed trackway seems to have been formed from a combination of natural hollows, a low point in the paddock wall and sheep tracks. This is now interpreted as not being a genuine archaeological feature.

A possible small roundhouse with short sections of surrounding walling (PRN 12315) was included in the drone survey but was not inspected on the ground. This feature lies just outside the proposed extension area.

A possible curving wall was identified within paddock PRN 60375, and this was investigated in the target excavation as (4009), see below.

5.3 Target Excavation

Figure 13 to 19

5.3.1 Natural and overlying deposits

The natural deposits (4003) across the site consisted of glacial deposits, mainly a pale brown gritty clay with numerous stones, representing the surface of the boulder clay. In places this was altered or reworked and appeared as orange-brown silty clay with fewer stones (Plate 25). In the lower, northern part of the site the cleaner clay was replaced by a mid-grey gritty silty clay (4036) that appeared to be a colluvial deposit resulting from the movement and mixing of the underlying deposits due to frost action.

Boulders up to 5m long were embedded or partially embedded within the glacial deposits, though some rested on their surface (Figure 13, Plate 26). These boulders were randomly distributed but with some concentrations, such as in the south-eastern corner of the excavation area. Similar boulder concentrations were also found beyond the investigated area, and these represent naturally formed boulder fields. Some of these boulders were used within the paddock walls.

Very thin patches of a dark grey-brown silt containing occasional flecks of charcoal (4011) were found across the site (Plate 27), though this layer was mostly lost during machining. A similar layer (4018) of mid grey gritty silty clay with gravel and occasional charcoal flecks (Plate 28) underneath an extensive heap of stones (Group 4010) appeared to be essentially part of the same layer. This thin deposit is interpreted as the remains of a buried soil horizon. Nowhere was the relationship of this to the paddock boundaries seen, but it was sealed under the stones

of Feature 4010. As these stones overlay the paddock boundaries it is probable that this buried soil was the ground surface when the paddocks were in use.

Over the buried soil a thin layer of degraded peat had developed in the lower part of the site. This peaty soil (4007) was a soft, friable and very dark brown organic silt, up to 0.2m deep but generally much thinner. This peat covered the paddock walls in the lower parts of the site and covered the circular stone structure (4008). The peat had obviously developed after the paddock walls and the wall (4014) of Structure 4008 had collapsed, marking a phase of the site when the paddocks were abandoned, and the ground became wetter. The equivalent layer on the higher part of the site was a brown slightly sandy silt, which became paler grey-brown with depth. This layer (4002) was up to 0.15m thick and represents soil development over the drier part of the site and this covered the stones of Feature 4010. The current active topsoil (4001), only about 0.1m thick, had developed on 4002 and 4007. Across parts of the eastern side of the site deposits of a very pale grey silt with lenses of fine gravel (4006) had washed across the site. This deposit overlay the peat and covered Structure 4008 and some parts of the walls of the eastern paddock. A thin topsoil had developed on top of 4006. This appeared to be silt that had washed down from the quarry workings quite recently, possibly during the extension of the quarry working area in 2014 (GAT 2014). Prior to the targeted excavation this layer caused some of the features, particularly Structure 4008, to be much less well-defined on the ground surface than they were even a few years previously.

5.3.2 The Paddocks

See Figure 13

The eastern end of paddock PRN 60375 is defined by the remains of a wall (4030) on the north side running to a large boulder (Plates 29 and 30). In its collapsed state this was up to 2.10m wide but the likely *in situ* stones give a width of about 1.5m. Few of these *in situ* stones are laid flat, with many sloping at a variety of angles, making them poor foundation stones for a wall. Some of the larger stones are embedded in the natural deposits and are pre-existing boulders incorporated into the wall. Like all the paddock walls there was no trace of a foundation cut and the stones lay directly on the glacial clay or on boulders that were part of the natural boulder field.

North-east of the very large boulder this wall appears to curve into a straight wall (4031) running north-west to south-east (Plate 31). The spread of stones here is up to 2.30m wide but much of this is due to collapsed stone. This section of wall also includes some boulders

embedded in the natural deposits and more of the stones lie flat, making it appear a better foundation for a wall than 4030, but the stones are not laid in a regular, organised manner.

The south-eastern end of this wall is marked by a boulder, 0.7m long and about 0.8m high, which rests on, rather than being embedded in, the natural deposits, suggesting that despite its size it had been moved into position (Plate 32). Stones (4028), forming part of Feature 4010, had spread across this area but their removal demonstrated that there was a gap here, south-east of the boulder. The wall continued on exactly the same line about 9m to the south-east. This continuation (Wall 4035) was only 8m long (Plate 33) and, at its south-eastern end, abutted a very large boulder projecting out of the hill slope. The north-western end of Wall 4035 is also marked by a fairly large stone that seems deliberately placed. The gap between Walls 4031 and 4035 may be an original entrance, though it seems large for a normal field entrance. Access would also be partly obstructed by large boulders to the south-west. It would be more practical to have an entrance further north, on more level ground and away from the group of large boulders under Feature 4010. The gap is, therefore, possibly due to stone robbing rather than an original entrance.

There is no wall running south-west from the southern end of wall 4035. The southern side of paddock PRN 60375 is basically formed by the steep rocky scarp which runs across the site.

Curving north-east from the south-eastern end of Wall 4035 was the wall (4034) defining Paddock PRN 60376. The south-western part of this wall was not exposed but the stones of the wall could be seen projecting from the turf (Plate 34). Here they ran across the slope with the ground sloping fairly steeply down from south-east to north-west. This slope was covered with natural boulders, both above and below the wall. The northern end of Wall 4034 ran north-north-west to south-south-east, incorporating two large boulders. Here, where the wall was exposed in the excavation, the collapsed stones covered an area 2.6m wide. The line of the wall became uncertain as it approached Structure 4008, as discussed below.

From the north side of Structure 4008 the paddock wall continued to the north-north-west. The relationship with Structure 4008 is discussed below. This part of the wall (4033) ran fairly straight, and its south-south-eastern end was the most organised section of walling with several large stones laid fairly flat in a rough line, and suggestive of a functional wall foundation (Plate 35). Further north the stones are more confused. In this section the stones lay on a collection of large boulders, and they have moved or collapsed and few lie on the wall line (Plate 36). The northern end of this section was marked by a very large pre-existing boulder that was incorporated at the corner of the wall. From here the wall (4032) ran south-west. This

had the largest amount of collapsed stone, which had slipped down slope forming a spread of stone up to 2.5m wide (Plates 37 and 38). The probably *in situ* wall stones formed a straight line only about 1m wide along the south-eastern, upper, side of this spread, but many of these stones rested at steep angles and would have made a poor wall foundation. Wall 4032 probably abutted the corner where Wall 4031 curved into the large boulder, but the confused character of the wall stones made such relationships almost impossible to prove. The general layout does, however, suggest that the wall of Paddock PRN 60375 was built before that of Paddock PRN 60376, which was added on to extend the line of paddocks. There may have been only a brief time between the building of these walls and both paddocks probably functioned together for most of their use.

There appears to have been no activity inside the paddocks that left archaeological traces. Occasional small patches of charcoal were seen but these were irregular and appeared to be burnt-out roots, probably the result of gorse clearance. The only exception, other than Structure 4008, was a narrow, straight gully [4005]. This ran east-south-east to west-north-west down the slope from a boulder embedded in the natural (Plate 39). The gully was 4.5m long, fading out at its west-north-western end, and was up to 0.46m wide and 0.16m deep (Plate 40). The profile of the gully was a broad V-shape, but its sides were often irregular and difficult to find. The fill (4004) consisted of small stones in the base with a dark grey organic silt above. The stones suggested an erosion deposit covered by a peaty soil similar to Layer 4011. Although this gully was very straight it seems likely that this was an erosion gully sealed under the buried soil, and there was no firm evidence of it being anthropogenic. A rough line of stones to the east, extending under Wall 4031 appeared to be the continuation of this feature. These stones were partially embedded in the natural deposits and support the interpretation of this feature as a natural feature.

Previous survey had identified a possible wall within Paddock PRN 60375 running from south-west to north-east then curving to the north. The excavation exposed the northern part of this feature, and it was recorded as 4009. The whole feature is about 14m long with about 6m exposed in the trench. It was seen as a rough line of stones wedged over and between bedrock and boulders embedded in the natural clay (Plate 41). The stones were sub-angular and up to 0.85m long and none appeared to be deliberately placed. Other similar stones were scattered off the line. As the paddock walls are formed of haphazardly placed stones often at various angles it is difficult to firmly identify denuded remains of a wall, but there seemed to be nothing to indicate that this line of stones was a wall. It appeared more likely to be a naturally formed line within the boulder field.

5.3.3 Structure 4008 (PRN 60378)

Figures 13-16

A circular stone feature against the eastern side of Paddock PRN 60375 had been identified during the previous phases of this project. A test pit (TP18) dug to the north of this produced iron smelting slag and another test pit (TP32) dug in the middle of the feature also produced slag and a small pit [3204] was excavated in its base (Figure 13). Despite the presence of the pit, it was concluded that this was not the location of the iron smelting, but that smelting waste had been dumped here. This interpretation was due to being unable to see enough in the base of the test pit to interpret the feature correctly. Excavation of the whole feature demonstrated that this structure was indeed the site of iron smelting.

The circular structure overall measured 6.7m by 6.1m externally, and the stone forming the wall was up to 1.1m high, but this was largely due to a large boulder in the south-east quadrant (Figure 14, Plates 42 and 43). There was an entrance, on the north-western side of the structure (Plate 44). The wall (4014) of the structure was composed of sub-angular and sub-rounded stones up to 1.2m long. Some were laid flat on the buried soil surface, but many lay at a variety of angles. There was no matrix between the stones, except the peat deposit (4007) which had built up over the collapsed wall and filled gaps between the stones. Many of the upper and outer stones (4043) appeared to have slipped, slumped or been otherwise disturbed (Figure 13), but even when these had been removed there was no organised structure to the wall (Figure 14). There were no facing stones and no obvious jamb stones making the sides of the entrance. The stones were not laid in a way that would have formed a secure foundation for a drystone wall. Once loose stones had been removed the interior of Structure 4008 measured about 3.3m by 3.5m and the entrance was about 1.0m wide.

Wall 4014 was built on a buried soil, the A horizon of which (4037) was a firm grey clayey silt with paler and darker lenses. It was seen in section under the wall (Figure 15) but was also present in patches inside the structure under an occupation layer (4015) (see below for description). Layer 4037 could be distinguished from layer 4015 because the latter contained charcoal and rotted sandstone fragments, while the former did not. The B horizon under 4037 was a pale grey silty clay with iron oxide mottling (4038).

Inside Structure 4008, against the northern side of the wall, immediately east of the entrance, was an elongated oval pit [4017], measuring 1.7m by 0.8m and up to 0.4m deep, with steep sides curving into a rounded base (Plate 45). From the southern corner of this ran a shallow channel 0.26m wide and 0.13m deep. This channel had gradually sloping sides and its sides

and base were heat-reddened and there were concretions lining parts of the base. It ran south-south-east into a small D-shaped pit (Plate 46). This pit [3204] was the feature excavated in the base of test pit 32. It measured 0.47m by 0.38m and was 0.12m deep. The pit had gently sloping sides and a rounded base, but the southern side was vertical and in parts overhanging. The sides of this pit were heat-reddened, and the base was a lump of hard concreted material (4042). This material was partially vitrified and in parts resembled iron oxide concretion, and this is assumed to be part of a furnace floor, perhaps partially produced from the vitrification of the natural sediments.

In the base of Pit 4017 was a dark grey gritty silt (4040), 0.3m deep, with some stones and a high proportion of charcoal (Figure 16, Plate 47). It contained considerable quantities of slag and against the lower sides and base were patches of white silty clay and red-brown patches high in iron oxide. In places along the sides of the pit were cleaner, largely charcoal-free erosion deposits and in some places the sides of the pit were hard to determine as these erosion deposits resembled the natural layer that the pit was cut into.

Filling the upper part of Pit 4017 and the channel was a dark brown gritty silt with occasional stones (4016). This contained numerous pieces of slag throughout but at the point where the channel met the pit the channel was blocked by several lumps of slag (4041). These were closely packed and stacked together in what appeared to be a deliberate way, blocking off the channel (Plate 48). The lumps were not shaped or worked in any way and were not cemented together but they did appear to have been deliberately placed.

Several stones (4039) up to 0.5m long had fallen into the top of the oval pit over Fill 4016 (Plate 49). One angular blocky stone was deeply embedded in the fill of the pit and several flat stones sloped down the pit side. The stones were associated with a brown silt that had probably washed in when the site was abandoned. The stones appeared to be part of the tumble (4043) from the wall of structure 4008, which had collapsed into the partly filled pit.

Pit 4017 had been cut up against the *in situ* stones of Wall 4014, as if carefully fitted into this corner of the structure. One large stone did extend over the edge of the pit, but it is likely that this had slipped slightly from its original position. These features were clearly in use within the structure, which must have been built especially to shelter the activity.

The fill of Pit 4017 was sealed and obscured by a thin layer, about 0.05m thick. This layer (4015) was a dark grey-brown clayey silt with some fine gravel and small stones. It was distinguished from the fill and other deposits by fragments of degraded yellowish mudstone. Layer 4015 was spread over all the interior of Structure 4008 and extended out of the entrance on the north-western side of the structure. This deposit contained numerous pieces of slag,

and more was recovered at the interface between 4015 and the peat layer 4007. These finds were recorded as from Layer 4007 but had clearly originated from 4015.The slag came mainly from inside Structure 4008, immediately south-west of Pit 4017, though a considerable amount had also spread outside the structure through the entrance (Figure 18). Relatively little slag was found in the south-eastern half of the structure. Layer 4015 is interpreted as a deposit created during the use of the structure, though the fact that it sealed the fill of Pit 4017 suggests that it was also forming when the furnace went out of use. It may have been the result of material from the smelting being trampled into the pre-existing topsoil and this mixing and trampling continued after the smelting finished.

Structure 4008 lies on the eastern side of Paddock PRN 60376. On the north side of the structure Wall 4033 runs up to the structure, and Wall 4034 is on the south side (Figure 14). The relationship between the structure and the walls is uncertain, due to the denuded state of the walls and the collapse of the structure. Even before the collapsed stones were removed Structure 4008 was a neat circular shape and did not appear to be incorporating a pre-existing straight wall. The line between Walls 4033 and 4034 is straight and Structure 4008 lies across this line. Wall 4033 runs right up to Structure 4008 and was thought on site to be abutting it, but Wall 4033 is notably denuded with less collapsed stone around it than other sections of the paddock walls (Plate 35). This suggests that Structure 4008 has cut through the wall and reused stone for building the structure. About 3.5m south of Structure 4008 Wall 4034 has a broad spread of collapsed stone but between there and the structure there is little stone, with just a few wall stones remaining and no collapsed material (Plate 50). The few remaining stones suggest that this was not an original entrance but that this part of the wall has been heavily robbed of stone. The conclusion is that Structure 4008 was built roughly on the line of the wall but that instead of incorporating the wall the stones were reused and entirely rebuilt into the circular structure. The fragmentary state that the wall was left in either side of Structure 4008 suggests that the Paddock PRN 60376 was out of use and probably the wall already collapsed before Structure 4008 was built. It is impossible to determine if Paddock PRN 60375 was still in use when Structure 4008 was built but it seems probable that this was also collapsed and out of use and the Structure 4008 stood alone in the landscape in a location where quantities of convenient building material was available.

5.3.4 Feature 4010 (PRN 60387)

In the south-western corner of the targeted excavation was a large mass of stones, recorded in previous phases of this project as PRN 60387 (Figure 13). In the assessment and survey

phase of the project this was seen as “two linked, roughly built structures with dimensions of 9.0 x 5.0m and 2.5m x 2.0m. A narrow passage leads into enclosure 4. These structures could be animal pens, or a hut circle with a small annex enclosure” (Cooke and Davidson 2010, 2).

This entire area was exposed in the excavation trench, deturfed and cleaned by hand and recorded as Group 4010 (Figures 13 and 19). This was a general spread of stones around and between a concentration of natural boulders, which were firmly embedded in the glacial deposits (Plate 51). The spread is about 17.5m long and 13.0m across. Stones in the northern and western parts of the spread were recorded as 4028 and described as mainly sub-angular but with some sub-rounded. While some of the stones are large, up to 1.4m long, many are much smaller. The stones in the southern and eastern part of the spread were recorded as 4012. Here the stones are described as generally 0.6m long or smaller, and mainly sub-rounded (Plate 52). There was subsoil (4002) over and between the stones and lower down a waterborne brown silt. There was no way to distinguish between stones 4028 and 4012 and these were part of the same spread or heap of stones.

Nowhere else in the excavation trench were smaller stones concentrated in this way, except in the walls. The concentration of stones therefore appeared to be from an anthropogenic rather than natural cause. This was supported by the stones (4012) extending over the collapsed remains of Wall 4035.

There were two hollows within the heap of stones. The eastern hollow (within 4012) measured about 3.5m by 2.6m and 0.8m deep, while the western hollow (within 4028) was more of a level area with few stones measuring about 8m by 5m (Figure 13). This hollow had large boulders around it suggesting a circular shape and in particular had a very large boulder set on edge on the southern side (Plate 53). This boulder (4020), measuring 1.8m long and over 1.68m high, resembled a large version of an orthostat as used in the construction of roundhouses in the area. It is. Smaller stones (4013) were built up against the northern side of the boulder within the hollow area.

The hollows and the “orthostat” 4020 had led to the interpretation of this feature as possibly two enclosures or even roundhouses. As cleaning was undertaken over the area it was felt that the eastern hollow at least could potentially be the remains of a roundhouse. To investigate this an area of loose stone (4012) was removed to expose any potential wall remains (Figure 19, Plate 54). The stone was moved by hand and placed into the machine bucket for removal from site, enabling each stone to be selected individually and removed with no disturbance to other stones.

Removal of 4012 showed that the hollow was partly due to a slight scarp in the natural slope (Figure 17). The scarp was created by a “cut” [4026] about 0.4m high (Plate 55). Against the face of the scarp was an erosion deposit (4027) of brown and grey-brown gritty silt and small and medium sized stones, as well as three larger stones that had slumped down from further up the slope. It was considered whether this was a terrace cut for a structure, but both inside and outside the “cut” was a layer (4018) interpreted as a buried soil. This would have been removed inside the cut if it had been a terrace; the erosion deposit (4027) sealed the lower part of Layer 4018. The interpretation is that there was an erosion event before the deposition of the stones 4012 which caused some of the natural slope to slip and created scarp [4026].

To the south of the scarp were several stones in a rough line (Figure 19). Removal of Stones 4012 exposed two stones resting on the natural deposits as if placed and forming a short arc with a fractured boulder (4025) (Plate 56). Another stone resting neatly and level further north could possibly have been seen as continuing the arc. The slumped stones could have slipped from locations on this arc. These lower stones exposed by the removal of 4012 are recorded as 4021 and much thought was put into whether they could be the very fragmentary remains of a roundhouse wall. The rough line of stones did seem to form a southern limit to the stone spread but not necessarily the face of a wall. The potential inner face was very much the result of seeing patterns between stones in an area with a large number of stones, and it was concluded that there was no evidence of the coherent remains of a wall. The angular boulder 4025 was embedded in the natural deposits but had been extensively fractured (Plate 57). There were no blasting drill holes visible but it resembled fracturing due to blasting. An adjacent large rectangular boulder (4029) had also been broken, with fracture lines running through the main body of the boulder. This was probably done by blasting as a large piece had been broken off and tipped at an angle, though again no drill holes were seen (Plate 58). The fractured surfaces appeared too fresh and the fracturing too extensive for this to be the result of peri-glacial fracturing. Both 4025 and the broken slab from 4029 had been covered by stones 4012, showing that their deposition had occurred after the fracturing. If this fracturing was the result of blasting, then this indicates a late date for the deposition or movement of many of these stones.

The suggestion that there was never a roundhouse in this area was supported by the lack of a floor level or other features within the proposed interior. The thin layer of grey gritty silty clay (4018) was similar to the buried soils elsewhere in site and is also interpreted as a buried soil. There was also a linear spread of stones (4023/4024), some of which were flat and lying level on the surface (see Plate 28). This had a dark brown peaty soil in the top but lower down many of the stones were embedded in the natural clay and the sides of the feature were irregular

and diffuse. Part of this feature that was investigated included a hollow filled with orange silt, but with poorly defined sides (Plate 59). This whole feature is interpreted as of natural origin probably caused by peri-glacial frost action with the subsequent development of peaty soil. There were some fragments of charcoal present but there was charcoal in other patches of buried soil, and it is probable that this was part of the ground surface when the paddocks were in use, before the deposition of 4012, with charcoal from clearance activities.

Despite careful excavation and recording it was concluded that there was nothing present that indicated a roundhouse under Stones 4012. Jenny Emmett of Heneb Planning visited the site and agreed with this conclusion and also agreed that the time and expense required to remove the rest of 4012 was not justified by the available evidence.

In the eastern hollow Stones 4013 were removed to expose the base of Boulder 4020. A sondage was dug against the base of the stone, and this proved that it was embedded in the natural clay and not set in a socket or resting on the surface (Plate 60). Boulder 4020 must therefore have ended up in this position due to the movement of deposits that had caused the boulder field. It is not unusual to find boulders in natural boulder fields that have been left lying at steep angles or on end. Boulder 4020 was not put in place by human agency and can therefore not be considered an orthostat or part of an enclosure. All other boulders in this area that seemed to form a rough circle were also firmly embedded in the natural clays and were also part of the natural boulder field. Removing Stones 4013 revealed a thin (0.05m thick) layer of grey clayey loam (4019) associated with angular and sub-angular stones (4022), many of them flat, including pieces of slate (Plate 61). Layer 4019 is interpreted as buried soil and was similar to 4018 and other patches of buried soil on site. Stones 4022 were probably also deposited by natural processes as part of the formation of the boulder field.

The conclusion of the excavations was that Feature 4010 was a heap of stones, probably from field clearance, dumped over a natural boulder field. The stones of 4012 extended over the collapsed remains of the paddock wall (4035), suggesting the dumping of stones occurred long after this wall went out of use.

6 DISCUSSION

6.1 Interpretation of features

If the interpretation of Structure 4008 as being built over and partly from the stones of the paddock wall is correct, then the paddocks appear to be the earliest features on the site. There is no evidence of settlement activity within them, though, about 47m north-east of the paddocks

two potential structures were identified in the previous phases of this project. PRN 12327 is roughly rectangular in plan and is suggested to be a long hut or hafotty, and PRN 60383 is circular and may be a roundhouse. The relationship of these to the paddocks is unknown, though their distance from the paddocks suggests that they are not related, if indeed they are structures at all. It is possible that there may have been timber or stake-walled houses within the paddocks, which may be revealed during the watching brief on the site, but the present evidence suggests that this was not a settlement. Instead, these were an isolated group of paddocks, presumably for livestock management while grazing animals in the uplands.

The boundaries of the paddocks were presumably drystone walls, but the amount of stone left is insufficient to account for walls of a functional height. This can presumably be explained by stone robbing for the sheepfold and possibly stone being removed from the walls and deposited on the stone heap (4010). However, the lack for carefully laid foundation stones may indicate that these were stone and earth banks rather than walls, so requiring less stone. The absence of clay or other material to form a bank could suggest that this was not the case or could be explained by centuries of erosion.

No certain entrances were found into the paddocks, though it is possible that there had been an entrance under Structure 4008. There was a substantial gap in the wall between Paddocks PRN 60375 and 60376, though this seems to be poorly placed to be functional as it would have led into the boulder field under Stone Heap 4010. This gap may therefore also be the result of stone robbing, but there may have been a narrower entrance in this area.

It is suggested that stone from the eastern boundary of Paddock PRN 60376 was used to build a small circular structure in which iron smelting took place. The stone forming the wall of the structure (Structure 4008) would be sufficient for a low wall. The distribution of stones suggests that they have slipped from their place, but that they have not otherwise been disturbed, making it unlikely that stone robbing has occurred on this structure. The irregular layout of even the lowest stones with no carefully laid foundation stones or evidence of facing stones suggests that this was not a wall built to support a roof. This structure is therefore interpreted as a small, roofless shelter built specifically to provide some shelter for the iron smelting. The entrance to the structure faces downhill, keeping runoff water out of the structure but also allowing easy access to people coming directly up the slope from the bog below. The analysis of the slag found in the evaluation suggested that bog ore was used for the smelting, and the extensive bog of Gwaen Gyfni is the obvious source of such ore. Prevailing winds are from the west and south-west, with north-westerly winds being more common in winter than summer. If the shelter was used in the summer, then the direction of the entrance may not have been a problem.

The heap of stones in the south-western part of the site (Feature 4010) was shown not to be the remains of built structures. No evidence of a roundhouse or roundhouses was found here, and the stone heap is interpreted as just that, a heap of stones gathered together in this area because there was already a concentration of boulders present here. This suggests field clearance with stones being removed as they come up in ploughing or as they are visible on the ground surface. There was no evidence of the area of the paddocks having been ploughed and there were numerous stones of all sizes visible of the ground surface across the paddocks so there is little evidence of extensive stone clearance. Perhaps some of the smaller stones on the surface have been cleared into this heap or some of the upstanding wall stone was moved here to reduce the height of the walls.

Possibly the stones mostly came from elsewhere. A natural rocky scarp, about 5m high, runs north-east to south-west immediately south-east of the paddocks. On top of this was a level area with notably fewer stones than elsewhere. This area of terracing has previously been recorded as PRN 60386 and has since been incorporated into the quarry. It was suspected that this level, largely stone-free area may have been an ancient field. Two evaluation trenches were dug across it in 2010 (Davidson 2010) revealing a shallow soil with no mixed plough layer, suggesting that in fact it had never been ploughed. It is possible that this area had been cleared of stone despite not being ploughed and some of the stone forming 4010 came from here, but there is no reason for the stone to have been carried so far. Any clearance stone would be much more likely to have been dumped along the top of the scarp. The source of the stone in 4010 remains a mystery.

6.2 Comparisons

Sheepfold PRN 29989 is a multi-cellular sheepfold. Nigel Beidas has been photographing and studying multi-cellular sheepfolds in the Carneddau and beyond and has created an excellent website (Corlannau-Sheepfolds) to present his results. He has identified the name of Sheepfold PRN 29989 as Buarth Cerrig Gwynion[2]. The term *buarth* generally being used in the Carneddau for a sheepfold rather than the more usual term *corlan*.

[2]https://www.cofnodicorlannau.org/corlannaur-carneddau-sheepfolds/english/galleries/gallery-3

Multi-cellular sheepfolds are typical of the Carneddau mountain range, with some excellent examples being found not far from Penrhyn Quarry, such as the sheepfolds in Cwm Wen (Cwm Caseg) (PRN 39322) and Cwm Llafar (PRN 38214). They are rare beyond the Carneddau, but this example is not far outside the usual range (Kenney 2014a, 10-11). They were used for sorting sheep where several farms shared a common sheepwalk. The sheep were all driven into the central dividing pen and could then be sorted into the smaller cells, which belonged to separate farms (RCAHMW 1956, lxxvii; Nigel Beidas (Corlannau/Sheepfolds website); Johnson 1998, 33-34). Their date of construction is uncertain, but they were probably introduced with the increase of sheep farming in the 18th century (RCAHMW 1956, lxxvii). Johnson (1998, 31) found historic evidence that at least some of the sheepfolds in the western Carneddau had gone out of use by the late eighteenth century, suggesting at least an early eighteenth-century date for their construction. Nigel Beidas has recently found depictions of multi-cellular sheepfolds on a Penrhyn Estate map (PENRA-2210) dating to 1786, proving that they had been built by that date and probably considerably earlier. Buarth Cerrig Gwynion does not appear on the Llandegai tithe map of 1841 (Tithe Maps of Wales website), but even those sheepfolds proven to be there in 1786 are not shown on the tithe maps, suggesting that these features on the Common were not considered worth depicting and that these maps cannot be used to prove the date of the sheepfolds.

There are numerous examples of ancient field systems around the lower slopes of the Eryri mountains. Terraced field systems such as those round Abergwyngregyn, e.g. Ffridd Ddu (RCAHMW 1956, 8-9) and at Llanllechid (RCAHMW 1956, 141) are of a different character to the paddocks as they were mainly for arable cultivation. The Penryn Quarry paddocks are more similar to upland enclosures, such as those found on Mynydd Du, Llanllechid ((RCAHMW 1956, 140), and in Cwm Ffrydlas and Cwm Caseg, Bethesda (RCAHMW 1956, 138-140, 144-145). These have stone walls defining small enclosures and have roundhouses scattered amongst the fields. The curved ends of the Penrhyn Quarry paddocks at the western end make them appear very like these Iron Age/Roman period examples, but the apparent lack of contemporary roundhouses means that the date of the paddocks remains open. Dating the smelting activity will provide a *terminus ante quem* date for the paddocks.

The enclosures at Crawcwellt West (Crew 1989, Fig 1) are similar to those at Penrhyn Quarry, if rather more irregular and, though fragmentary, suggestive of being part of a wider field system. This site also had intensive iron-working, but it is notable that much of this iron working was taking place in stake-walled roundhouses (Crew 1989, 11-13; 1998, 27-30). Apart from a platform on which they were constructed these are not possible to identify without excavation. At Penrhyn Quarry no building platform has been identified but it is possible that timber or

stake-walled structures may have been present on parts of the site beyond the target excavation.

The sites of Crawcwellt, near Trawsfynydd (Crew 1989, 1990, 1998) and Bryn y Castell, Ffestiniog (Crew 1987 and 2018), excavated by Peter Crew are the classic examples of Iron Age and Roman period iron working sites in north-west Wales. Some of the furnaces at these sites were fairly well-preserved, giving an indication of how the Penrhyn Quarry example looked and was used.

Pit [3204] was the very base of a smelting furnace, by comparison to F208 at Bryn y Castell (Crew 1987, 92, 93). Although F208 had a well-preserved superstructure its base was only a very shallow pit, resembling Pit 3204, which retained fragments of furnace bottom (4042). The superstructure of the furnace would have been cylindrical or cone-shaped, made of clay, which would be heavily vitrified internally. Crew (1998, 26) suggests the superstructure could have been up to 0.8m high when in use.

Pit 4017 with its channel to the furnace makes the Penrhyn Quarry furnace different to those at Crawcwellt and Bryn y Castell. Furnace F20 at Bryn y Castell was associated with a shallow pit full of charcoal. This pit was oval, similar to Pit 4017, but at about 0.8m long was less than half the length and it was little more than 0.1m deep (Crew 1987, 91, 92). While there were other pits at Bryn y Castell none were linked to a furnace by a channel. The channel was presumably to carry molten slag from the furnace into Pit 4017. Much of the slag present is flowed slag, showing that slag was tapped from the furnace, so presumably Pit 4017 was a tapping pit allowing this slag to be removed. No slag tapping took place at Crawcwellt and Bryn y Castell, suggesting a slightly different technology and a different date for the Penrhyn Quarry smelting. The use of slag-tapping is generally considered to be a Roman introduction, and tapping continues North Wales into the early medieval period. The technology then goes back to non-tapping smelting with tapping reintroduced again later in the medieval period due to Norse or Norman influence (Tim Young, pers. comm.).

Archaeomagnetic dating was used at Crawcwellt and Bryn y Castell. At Crawcwellt dates showed the furnaces had been last fired between 200-100 BC (one standard deviation) and 240 BC to AD 20 (two standard deviations) (Crew 1998, 32). Bryn y Castell had iron working in two phases: 100 BC to AD 70 and AD 150 to 250 (Crew 1987, 91). The similarities between the Penrhyn Quarry site and Crawcwellt and Bryn y Castell could indicate that the former was later Roman continuing the local tradition but adopting slag tapping. Dating the smelting activity is therefore critical for understanding its context and to contribute to the history of smelting technology in North Wales.

The circular stone structure (Structure 4008) in which the smelting took place is interpreted as a roofless shelter rather than a roofed building, so there is no reason this should be Iron Age in date. Comparisons for such a structure can also be found at Crawcwellt and Bryn y Castell. Crawcwellt site H had a furnace inside a circular stone structure with an internal diameter of c. 2.8m, only slightly smaller than Structure 4008 (internal dimensions of 3.3m by 3.5m). The entrance at Site H was in the east-south-eastern side of the structure, unlike Structure 4008, which had the entrance to the north-west, but in both cases the entrance was about 1m wide. In both cases the entrances opened downhill (Crew 1998, Fig 1), suggesting that the slope was the main determinant for entrance direction, not the prevailing wind or light. The entrance in Site H was marked by large orthostats, in contrast to the poorly defined entrance to Structure 4008 (Crew 1998, 25-26).

The appearance of the wall of the Site H structure is similar to Structure 4008, with randomly laid stones lying at various angles (Crew 1998, Fig 4), though this had more collapsed stone in its centre than Structure 4008. Site H was also located on an exposed shelf with extensive views, so even its location resembled Structure 4008 (Crew 1998, 25). The furnace in Site H was well-preserved and probably stood about 0.8m high when in use. Crew (1998, 26) questions how such a small building could function and suggests the walls stood about 1m high to allow headroom for working the furnace. However, despite the quantity of stone inside the building it appears that there was not enough to account for walls so high. Also, like Structure 4008 to *in situ* stones do not appear to be effective foundation stones for a wall. In both cases it is possible that the structures were fairly low, rather crudely built shelter walls and they were not roofed, which would solve the problem of headroom.

Site A at Bryn y Castell is a similarly isolated iron working structure (Crew 1988, Fig 1), but this structure was about 4m diameter internally. Though Crew (1987, 96, Fig 4) considered the wall to be poorly built and capable of supporting only a flimsy superstructure it had both internal and external facing stones and appears to have been much better built than the wall of Structure 4008. However, this may also have been a shelter rather than a roofed building.

Beyond Crawcwellt and Bryn y Castell few excavated examples of early iron smelting sites in North Wales could be found in a search of the grey literature; several features reported as furnaces (PRNs 92056, 92062, 97166) from Wylfa, Anglesey appear more likely to be ovens and were not associated with slag or smithing debris (Laverty and Horsely 2021). Some smithing sites have been excavated recently but these are not directly comparable to Penrhyn Quarry unless smithing waste is found in the bulk soil samples to indicate that smithing also took place here.

A small pit containing metal-working debris found above Llanfairfechan (PRN 100568), is still being studied and contains smithing debris, so may not be for smelting and its date is currently unknown (Kenney and Smith 2023, 41-44). An early medieval smithing site was found at Parc Bryn Cegin, Llandygai, where a fairly large shallow hollow was probably the smithing hearth with smithing waste spread some distance away (Kenney 2009, 106-107), but the remains did not closely resemble the Penrhyn Quarry site. Very late Roman or early medieval smithing also occurred at Parc Cybi, Holyhead, where a small shallow hollow represented the smithing hearth, and an anvil had been set within the backfill of a grave (Kenney 2021, 186-7).

A smithing site (PRN 34086) was found on the route of a gas pipeline east of Chwilog, and this had some similarities to the Penrhyn Quarry site as it had a shallow hollow and a larger pit. The shallow hollow was filled with smithing waste and an associated large oval pit measuring 2.1m by 1.4m and 0.4m deep, but there was no channel joining these. As a smithing rather than a smelting site no channel would be necessary as the lack of smelting slag showed that slag tapping had not occurred on this site. Radiocarbon dates showed the smithy to be medieval dating to the late 12th or early 13th century AD (Kenney 2014b, 24-25).

7 CONCLUSIONS

The survey of the sheepfold and the area of the paddocks has provided a detailed record of the above ground remains. The sheepfold has been recorded in detail to allow for its preservation by record. The targeted excavation has shown that within the excavated area there is no evidence of settlement, and the paddocks appear to have been for livestock management and at some distance from any contemporary settlement. The most significant discovery is the bloomery furnace with a slag tapping pit within a circular stone shelter. Excavated early iron smelting sites are rare in North Wales and to understand the development of smelting technology it is important that this one is dated. The slag, charred plant remains and potential fine metallurgical debris in the bulk soil samples all have considerable potential to provide information about the nature of the process and require further analysis. The Post-excavation Project Design below provides detailed recommendations for further work.

8 POST-EXCAVATION PROJECT DESIGN

8.1 Introduction

The management of this project follows guidelines specified in *Management of Archaeological Projects* and *Management of Research Projects in the Historic Environment* (English Heritage 1991 and 2015). Five stages are specified in English Heritage (1991):

Phase 1: project planning

Phase 2: fieldwork

Phase 3: assessment of potential for analysis

Phase 4: analysis and report preparation

Phase 5: dissemination

The post-excavation stage of the project includes phases 3 to 5. It is standard practice to create a project design for the assessment of potential phase and an up-dated project design after that phase is complete to inform the report preparation and dissemination phases. However, this design will cover the whole of the post-excavation work through to the end of the dissemination phase, which also includes archiving the artefact assemblage and records. The reason for this is to make it clear the full extent of the work required for the post-excavation phase of this project.

The purpose of the post-excavation phase of any archaeological project is to ensure that appropriate analyses are undertaken. This involves the identification of relevant specialists and careful definition of academic and archaeological objectives, to ensure that 'appropriate selection is made, and a publication produced which accurately reflects the value of the data collection.' All data sources are to be collated, quantified, and studied. This includes all site records, made up of the written record, drawn record and photographic record, all artefacts, and all environmental samples, including those suitable for dating purposes. The aim is to produce a detailed archive report that fully describes the site and the results of analysis and includes interpretations and discussion of the evidence. To complete this it is necessary to:

- Study of the site records and compile appropriate plans and representative sections, select appropriate photographs, and compose a detailed site narrative.
- Conduct analysis on artefacts and ecofacts
- Incorporate the findings of the specialist reports into the final report with any changes of interpretation and discussion necessary

- Conduct comparative research into the different periods of activity on the site to place them in their local and regional context

It is then necessary to publish the results so the archive report must be converted into a format suitable for publication, including selected illustrations and photographs.

It is also necessary to archive the finds assemblage and records appropriately for long term storage.

8.2 Post-Excavation Research Design

The main focus of the research design is the iron smelting site, but the relationship of this to the paddocks should also be explored. The small scale and location of the smelting shows that it is of an early date and whether that date proves to be Roman period or early medieval it is of national importance due to the scarcity of excavated examples of early iron smelting in Wales. A priority is to date the activity so that it can be placed in context of other activity in the local area and also how it fits into the chronology of the development of smelting technology in Wales. Analysis of the archaeometallurgical material will determine the types of activities undertaken, the type of ore used, and possibly if other metals were being worked as well as iron. The scarcity of excavated sites makes it important to obtain as much information as possible about the technology used and how it relates to earlier and later developments.

Consideration of the site in its local landscape is necessary with the range of other contemporary, earlier, and later sites. It also needs to be compared to other contemporary sites in the region and nationally, both across Wales and across Britain. The geographical context on higher ground above the bog of Gwaen Gyfni will be considered, as will the chronological context.

The *Research Framework for the Archaeology of Wales* was consulted to identify research priorities in Wales, though the current lack of dates on the smelting activity makes it unclear which period agenda should be consulted. The most recent iteration of the research agenda does not include an update for Late Bronze Age and Iron Age Wales (1500 BC to 43 AD) but in previous iterations it was determined that the following points should be focused on for research: "*Building Chronologies was key, settlement evidence, Palaeobotanical evidence, Social change and social processes, climate change and the impact on resource utilisation were identified as important*" (A Research Framework for the Archaeology of Wales 2016, Late Bronze Age and Iron Age Wales, 2). The 2016 document lists progress on investigating settlement sites, making activity away from the settlement now a priority to investigate. The 2014 document highlights mineral extraction and the utilisation of natural resources as a

priority for the Bronze Age and Iron Age: the use of bog ore being an important natural resource. The 2014 Early Medieval document also mentions the utilisation of natural resources with particular mention of iron-working sites and the importance of analysis using modern scientific techniques. The site of South Hook, Herbranston is mentioned with two slag-tapping furnaces that may provide comparisons to the present site. The 2016 refresh document on Early Medieval Wales also prioritises understanding of exploitation of resources and craft-working, as well as the importance of dating to establish chronologies. These priorities are repeated in the most recent review document (2017).

8.3 Methods Statement for Archive Report

8.3.1 Archive report summary

The working project archive has been created and checked. The finds have been washed and initially catalogued and boxed in advance of specialist study. The current report includes the detailed site narrative, interpretation and discussion, as well as all the plan and section drawings required for the archive report, and relevant photographs.

Further work required includes processing soil samples and studying the resulting charred plant remains, detailed cataloguing and study of the artefacts with some artefact illustrations and obtaining radiocarbon dates. The results of this work will require incorporating into the report, which may demand some alteration or addition to the discussion in light of the specialist results. Once a date has been obtained on the smelting activity this can be placed more accurately in its chronological landscape. Further research into comparable sites will allow full interpretation of this feature in its local, regional, and national context and will allow a discussion of the site and its place within the surrounding landscape.

8.3.2 Artefacts

Stone object – There is a single stone object (SF43), a broken pebble with use facets on one end showing that it was used as a tool. This was found in Layer 4002 over Stones 4013 within Feature 4010 (See Figure 13 for location). It is not clear whether this object relates to activity in the paddocks or to the use of the smelting site, despite its distance from this. Relatively little can be said about a single find like this. Basic recording will be done in-house.

Flint flake – A single flint flake (SF52) was found just outside Structure 4008 (see Figures 13 and 18 for location). Relatively little can be said about a single find like this. Basic recording will be done in-house.

Slag and other metal-working debris – 16.8kg of slag and metal-working debris, much of it iron smelting waste, has been recovered from layers and features within and around Structure 4008 (see Figure 18 for distribution of slag). This is important evidence of the nature and extent of smelting and other metal-working activities within this structure. Once the bulk soil samples have been processed this will produce a sample of fine metallurgical debris, potentially hammerscale and other debris indicative of smithing. This is important to determine whether smithing took place on the site as well as smelting. The quantity of this will not be known until the soil samples are processed and sorted. Full analysis of this material can determine the types of activities undertaken, the type of ore used, and possibly if other metals were being worked as well as iron. The material will be catalogued and assessed by Tim Young of GeoArch. The analysis phase to characterise the bloomery smelting slag assemblage will include up to 6 bulk elemental analyses and 2 Scanning Electron Microscope (SEM) Samples. If there is a useful smithing assemblage retrieved from the residue, then the analysis of this would include two SEM samples.

Soil samples were taken in case chemical analysis of these could provide more information on the activities in Structure 4008, but the advice of Tim Young is that these would not provide information that cannot be obtained from the slag. It is therefore not proposed to analyse these soil samples.

8.3.3 Ecofacts

Bulk soil samples – The 10 bulk soil samples will be processed by GAT using flotation with a 250-micron mess to separate out the charcoal and charred plant remains. The residue will be collected in a 500-micron mesh. The residue will be inspected for small artefacts; in particular magnetic archaeometallurgical residue will be collected using a magnet. Any finds will be included in the post-excavation programme and sent to the relevant specialists for study. Once all artefacts and any other useful evidence has been removed from the residues those residues will be discarded. The charcoal and charred plant remains will be bagged up as dry flots and will be studied by AOC Archaeology Group. Both the charred plant remains and the charcoal in the flots will be studied by Jackaline Robertson. The flots will be assessed and any samples requiring further analysis will be identified. Further analysis will include detailed identification of the charred plant remains to species and identification of the charcoal to species. This will result in a report with a discussion of the results.

8.3.4 Radiocarbon dating

Dating the smelting activity is critical for understanding its context and to contribute to the history of smelting technology in North Wales. There should be considerable quantities of suitable dating material from the bulk soil samples taken from Pit 4017, although if all the charcoal is oak there may be a problem in identifying sufficient short-lived samples for dating. The charcoal in these deposits appears to originate from the furnace and therefore to be related to the smelting activity. Radiocarbon dates will be obtained on this material. The material will be first identified to species and only short-lived species will be chosen. Where possible this will be short-lived fuelwood from the fire, such as small diameter twigs. The material in the sample from feature 3204, sampled during the test pitting phase, will be reanalysed to identify any twigs or sapwood that would be suitable for dating.

The radiocarbon dating will be carried out at the Scottish Universities Environmental Research Centre (SUERC) radiocarbon dating laboratory, which has a good reputation for producing high precision dates and for efficiency and customer service.

Depending on the identification of suitable material 2 dates will be obtained from Pit 4017 and 2 dates from the furnace base 3204. These will be high precision dates to ensure a short date range. Statistical tests and if appropriate Bayesian modelling will be carried out by Derek Hamilton of SUERC to obtain an estimate of the precise date of the activity and the duration of use of the furnace.

It should be noted that radiocarbon dates take approximately 14-18 weeks for processing.

8.4 Academic publication

The archive report will contain the detailed descriptions and interpretations of the site as well as the full specialist reports, and so will be of importance for anyone studying the site in the future. However, such a document is termed ‘grey literature,’ it is not widely available for consultation in libraries (though it will be available online and through the HER), and it is not peer reviewed, nor is it commonly used for referencing the findings in academic literature. A published report fulfils these requirements, and it is therefore intended to publish the results as a paper in Archaeology in Wales. This will highlight the site and the importance of the smelting evidence to archaeologists working in Wales.

The format will follow that of the archive report, but detailed descriptions of individual features will be reduced, and the text will be made more concise. Plans of all key features will be included, but only features discussed in the text will be labelled. Sections will be included where

they illustrate issues specifically discussed in the text. Photographs will be used where necessary to illustrate particular points or give general overviews. The specialist reports will be edited to be concise, and discussion will be limited to the important features, but the aim is to include all specialist reports in the publication.

8.5 Dissemination

The archive report will be held by Gwynedd Historic Environment Record (HER), where it will be available for public consultation and will be available online through the Archwilio website. The archive report will also be made available from the RCAHMW Coflein website.

The publication report will be widely available in Archaeology in Wales both to subscribers to the journal and in libraries. The archive and publication reports will disseminate the results of this work to the archaeological community, but the aim of archaeological work is to benefit the general public and inform them of the history of their area. It is, therefore, proposed to present the results in talks to the quarry employees and to the residents of Bethesda.

8.6 Archiving, storage, and curation

Storiel, Bangor (Gwynedd Museum and Art Gallery) has been chosen as the most appropriate repository for the artefacts and they have agreed to accept the finds. The Accession Number is **2024/20.**. By accepting this project design the client, as owner of the objects, agrees to the transfer ownership of the artefacts to the museum. Liaison with Storiel has established guidelines for the preparation and deposition of the archive. It should be noted that all museums now charge **£100** for deposition of each archive box or large object from commercial projects. This charge is included in the costs accompanying this document.

The cleaned artefacts will be appropriately boxed and labelled. A spreadsheet of finds will be submitted to the museum with the collection to aid cataloguing. Charred plant remains are not always accepted by museums, but these have as much, if not more, archaeological value as the artefacts and it has been agreed with Storiel that they will accept this important resource. The charred remains are in the form of dried flots in labelled bags to be stored in archive quality boxes. These are to be labelled and accessioned with the finds archive.

Storiel cannot accept the paper or digital archive, and the latter requires guaranteed long term active storage. Therefore, the full paper and digital archive will be deposited with the Royal Commission on the Ancient and Historical Monuments of Wales. RCAHMW holds the national archive of digital site records for Wales and has facilities to actively curate the archive. The

digital archive will comprise digital copies of reports and project designs, spreadsheets listing contexts, drawing, sample, photograph and finds registers, digital site photographs, survey data, backup scans of the context sheets, and scans of all site drawings. The RAW photographic files will be converted to TIFF for archiving. All files will have metadata in a format agreed with RCAHMW. Material from previous phases of this project will be archived along with the material from the mitigation phase.

The paper archive will include all significant site records from both the mitigation and earlier phases, e.g. context sheets, site registers, site drawings, site diaries, level books, as well as paper copies of the reports. The paper element will be placed in archive stable boxes and the Permatrace drawings will be rolled and placed in cotton bags.

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Maps

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FIGURES

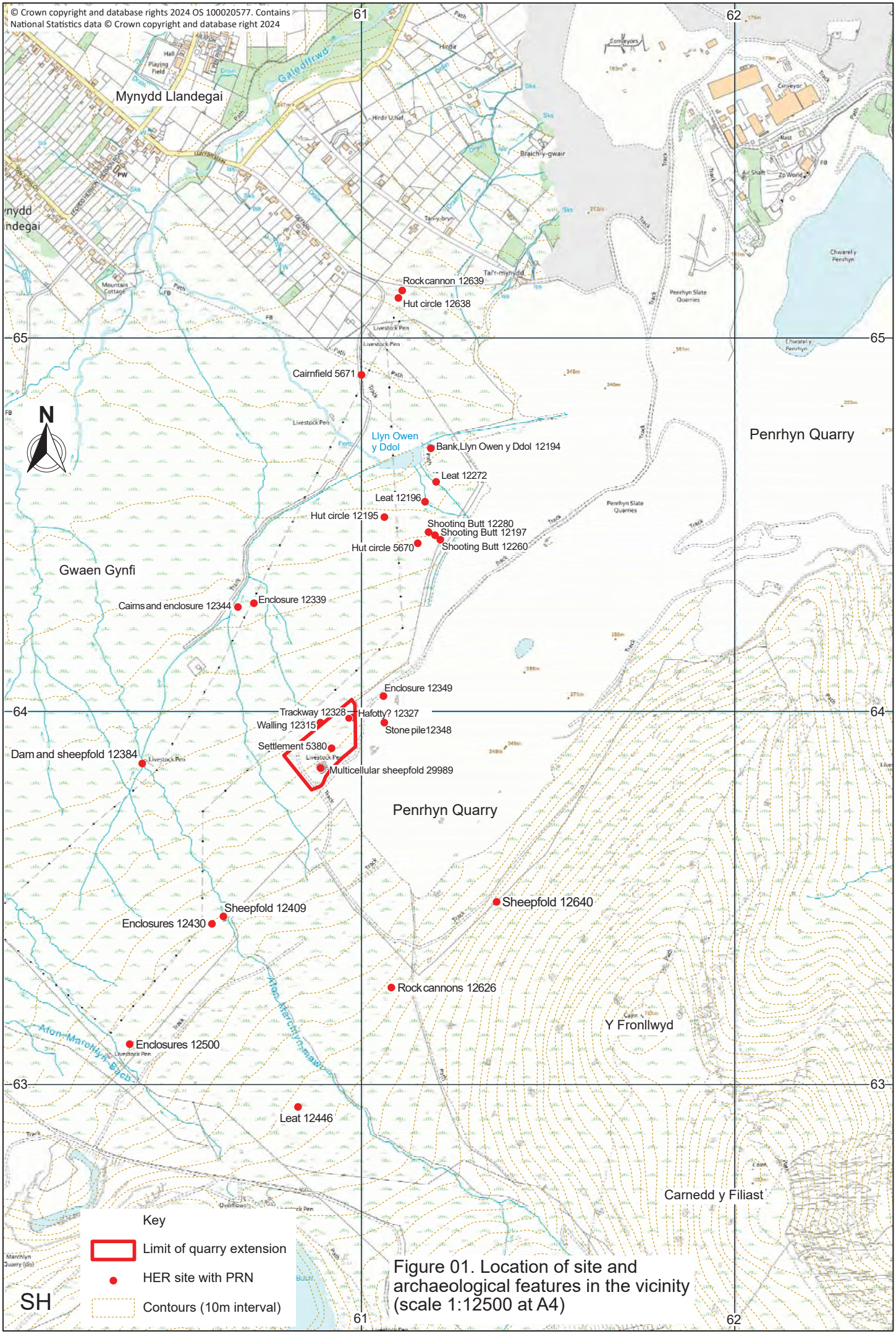
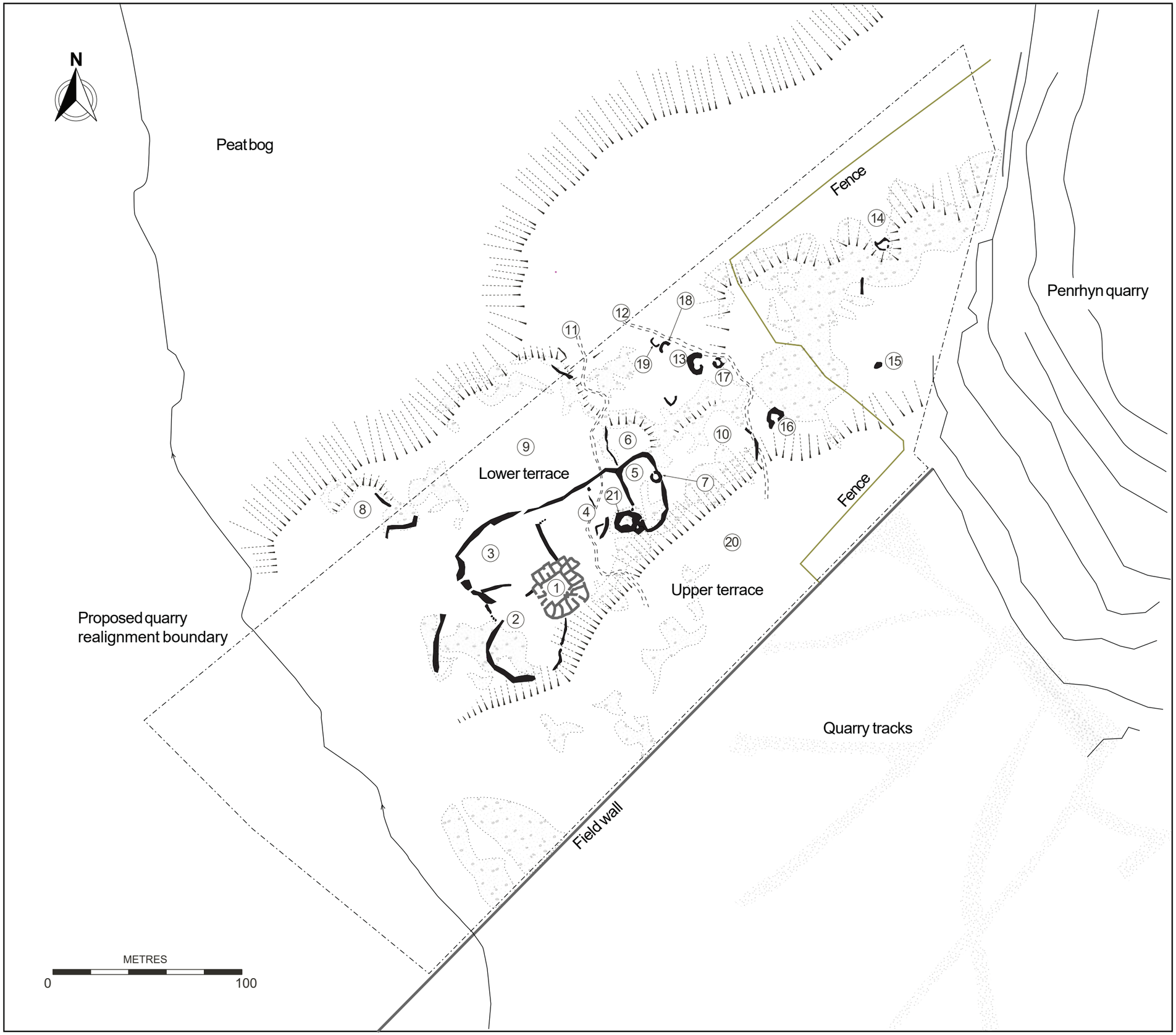


Figure 01. Location of site and archaeological features in the vicinity (scale 1:12500 at A4)



Heneb

Features

Feature no	PRN	Feature type
1	29989	Sheepfold
2	60373	Enclosure
3	60374	Enclosure
4	60375	Enclosure
5	60376	Enclosure
6	60377	Possible enclosure
7	60378	Possible hut circle
8	60379	Possible enclosure
9	60380	Possible enclosure
10	60381	Possible enclosure
11	12305	Possible trackway
12	12328	Trackway
13	12327	Possible hafotty
14	12349	Possible animal pen
15	12348	Stone platform, possible peat stand
16	60382	Natural feature
17	60383	Possible hut circle
18	60384	Possible structure
19	60385	Possible structure
20	60386	Natural terrace
21	60387	Stone heap/possible stock enclosure

Figure 02. 2010 survey of the site with features identified in the survey and desk-based assessment (scale 1:1000 at A3) (from Cooke and Davidson 2010)

Key

Previous trenches and test pits

HER site

Route of suggested trackway PRN 12305

Outline of paddock walls and other features

Top of natural scarp

Base of natural scarp

Quarry drainage channel

Targeted excavation

PRN 12315

PRN 60381

PRN 60377

PRN 12305

PRN 60380

PRN 60376

PRN 60378

PRN 60387

PRN 60375

PRN 60374

PRN 29989

PRN 60373

drain

quarry track

quarry track

drain

6400

6395

6390

6385

6380

6085

6090

6095

N

0

50m

Heneb

SH

Figure 03. Orthomosaic from drone survey of site (scale 1:600 at A3)

6088
6089
6090
6091
6386
6385
6384

Heneb

Key

Location of sheep creep

Numbers identify the cells as used in the text and photo register

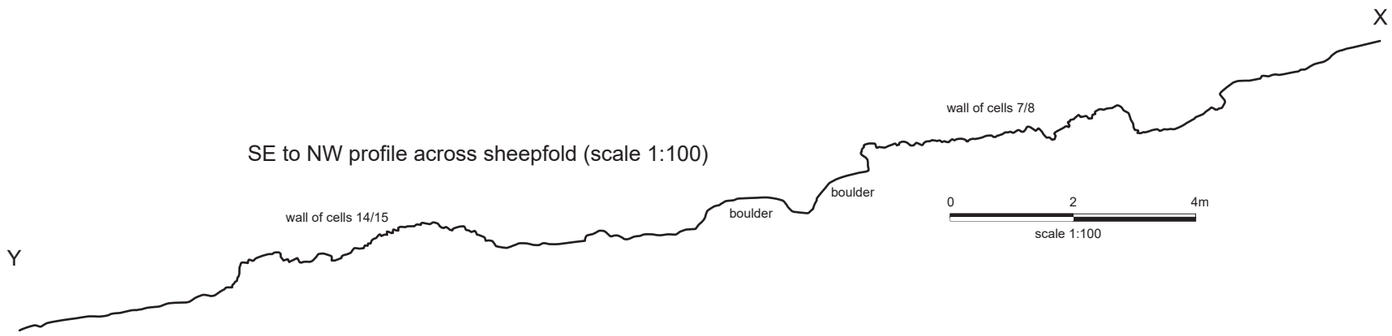
1
2
3
?
4
5
6
shelter
17
7
8
9
10
11
?
entrance
12
denuded wall
13
14
15
16
18
central pen

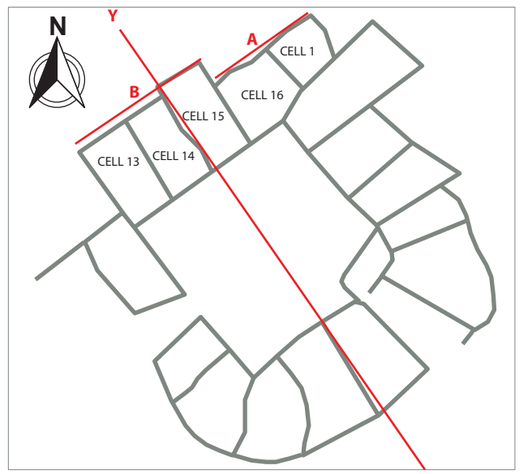
N

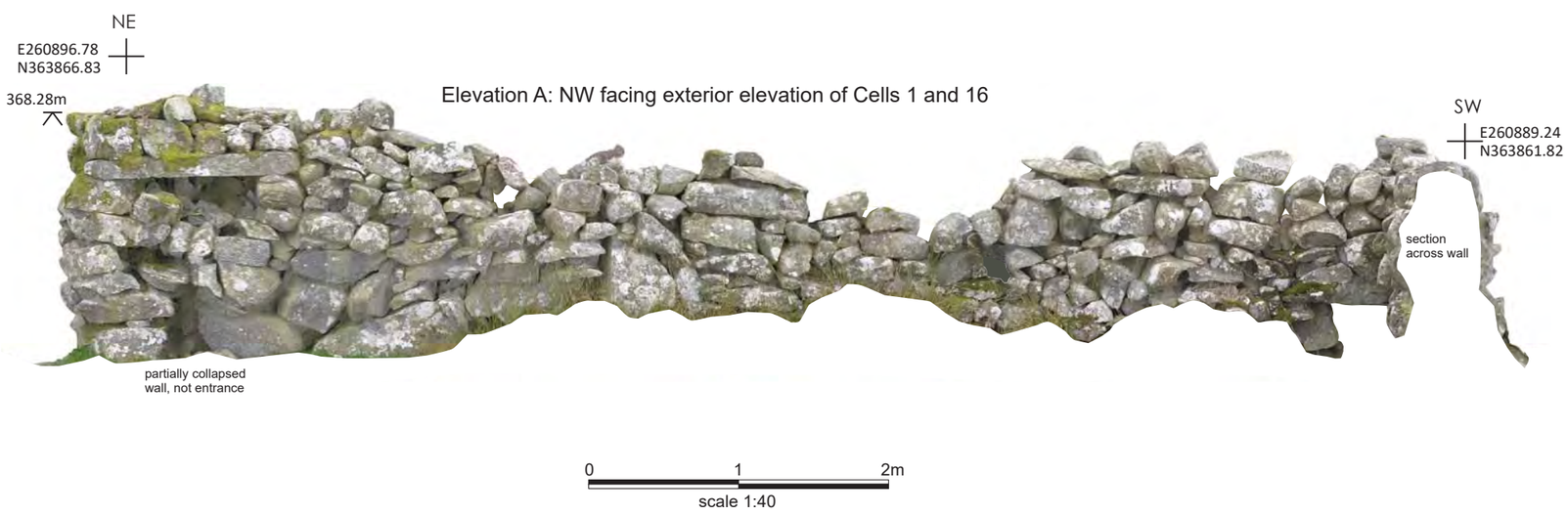
0 5 10m

SH

Figure 04. Orthomosaic from drone survey of sheepfold (scale 1:125 at A3)







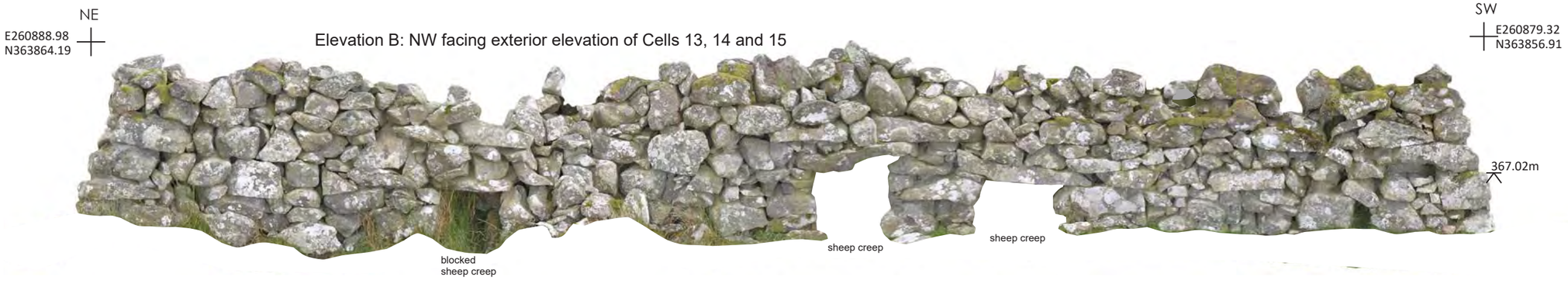
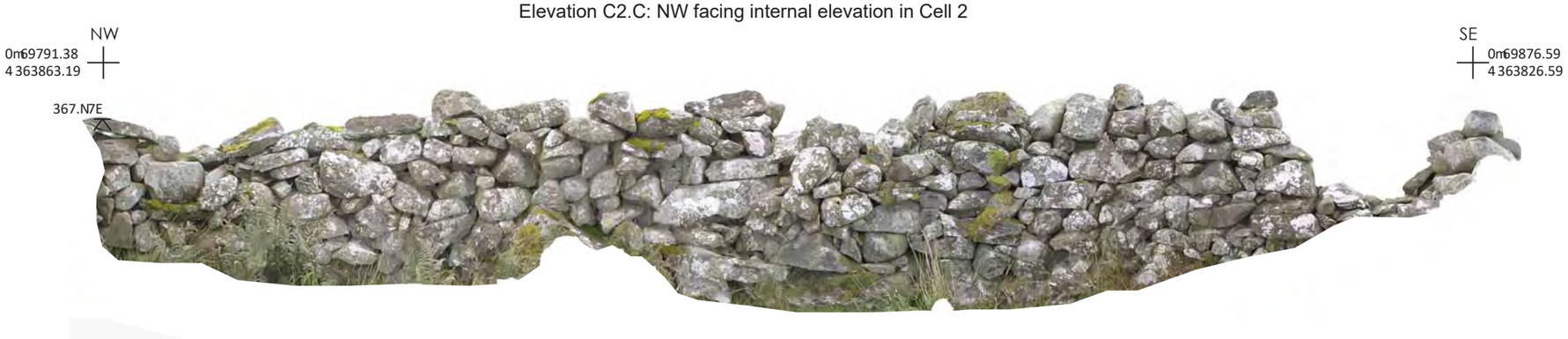


Figure 05. Profile across Sheepfold PRN 29989 and exterior elevations of north-western side of the fold (scales 1:100 and 1:40)

Elevation C2.A: SE facing internal elevation in Cell 2

Elevation C2.B: SW facing internal elevation in Cell 2

Elevation C2.C: NW facing internal elevation in Cell 2



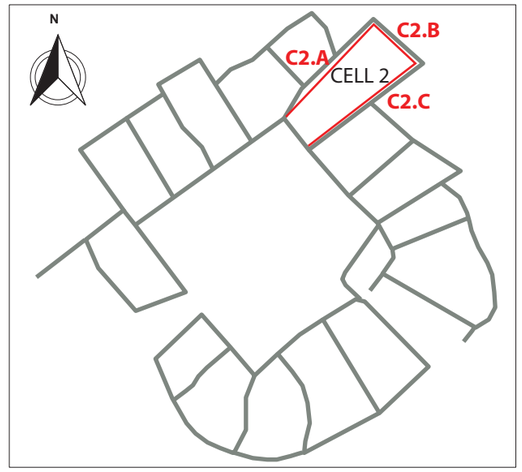
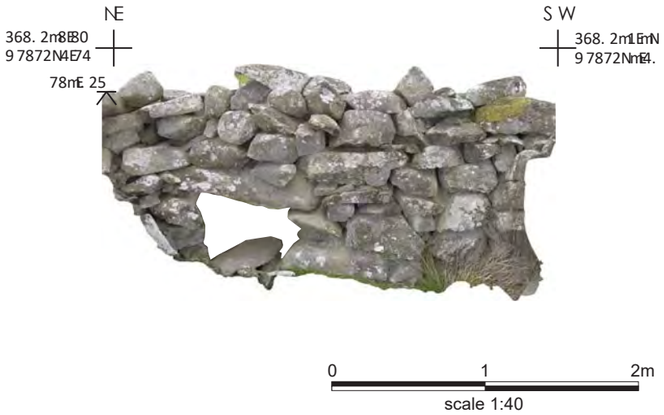
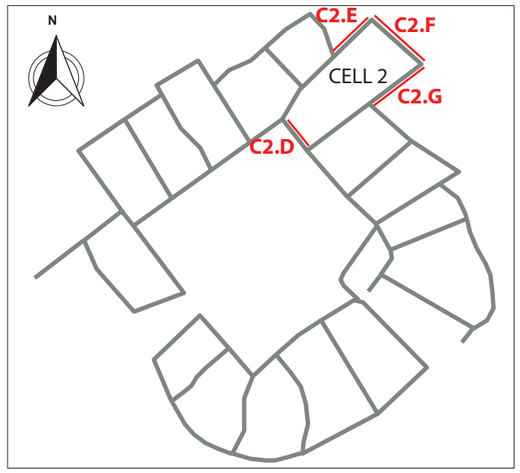


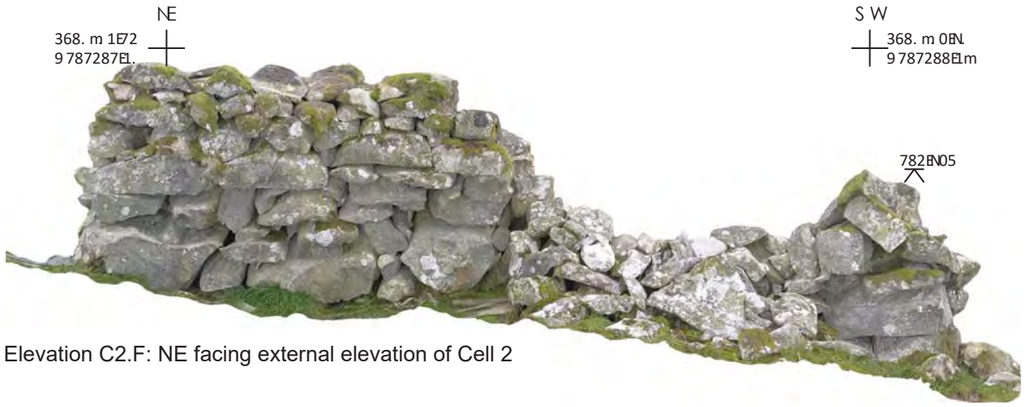
Figure 06. Interior elevations of Cell 2 in Sheepfold PRN 29989 (scale 1:40)

Elevation C2.D: NE facing internal elevation of Cell 2



Elevation C2.E: NW facing external elevation of Cell 2



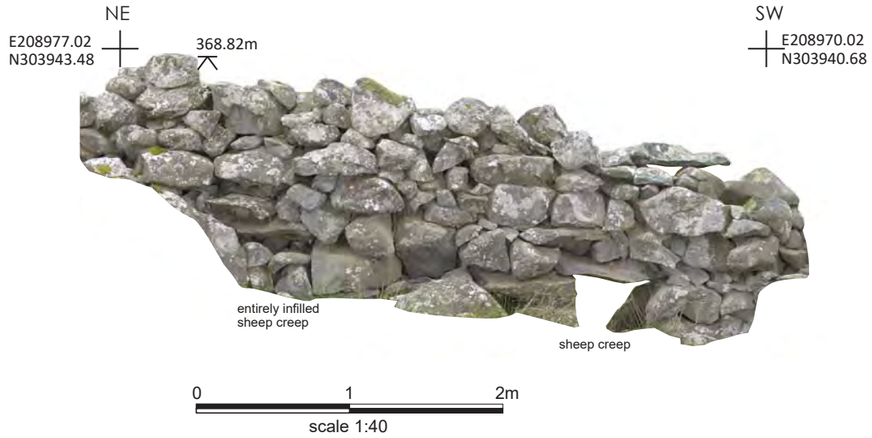


Elevation C2.F: NE facing external elevation of Cell 2

Elevation C2.G: SE facing external elevation of Cell 2

Figure 07. Interior and exterior elevations of Cell 2 in sheepfold PRN 29989 (scale 1:40)

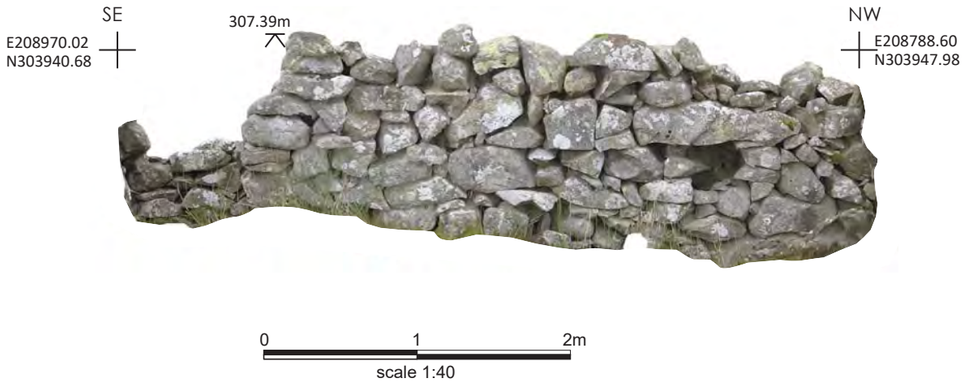
Elevation C3.A: NE facing internal elevation of Cell 3



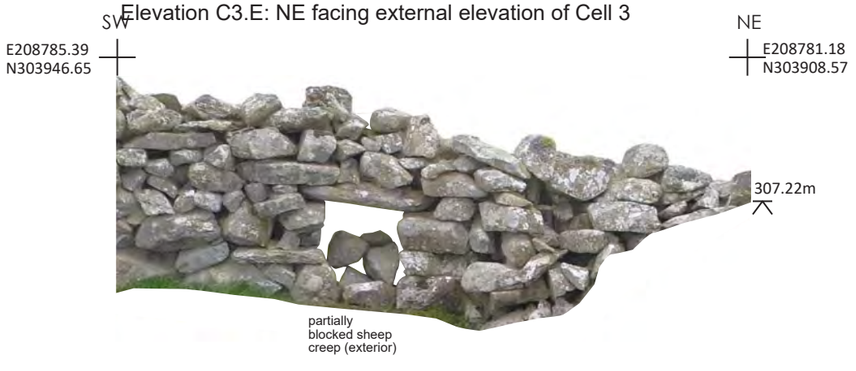
Elevation C3.B: NW facing internal elevation of Cell 3

Elevation C3.C: SW facing internal elevation of Cell 3

Elevation C3.D: SE facing internal elevation of Cell 3



Elevation C3.E: NE facing external elevation of Cell 3



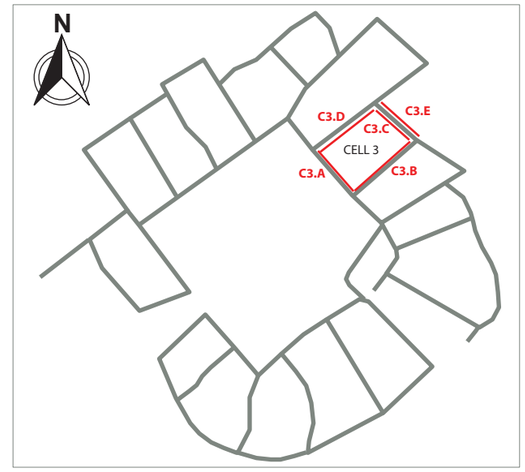
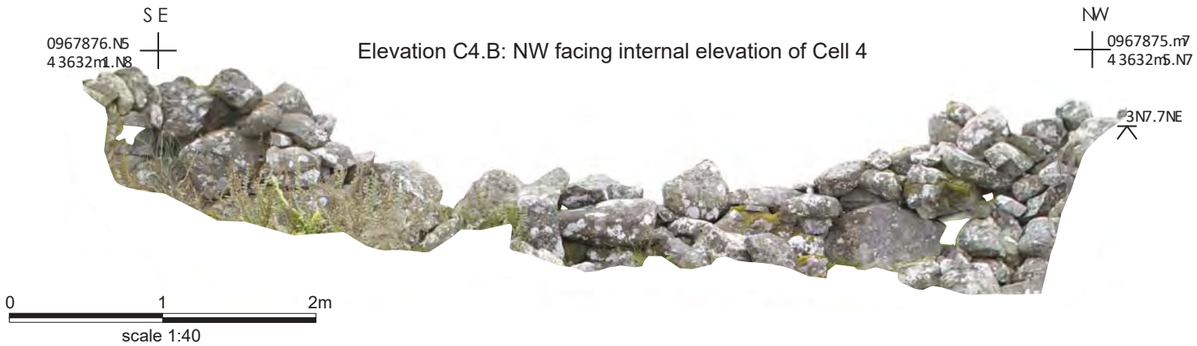


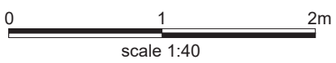
Figure 08. Interior elevations and one exterior elevation of Cell 3 in Sheepfold PRN 29989 (scale 1:40)

Elevation C4.A: NE facing internal elevation of Cell 4

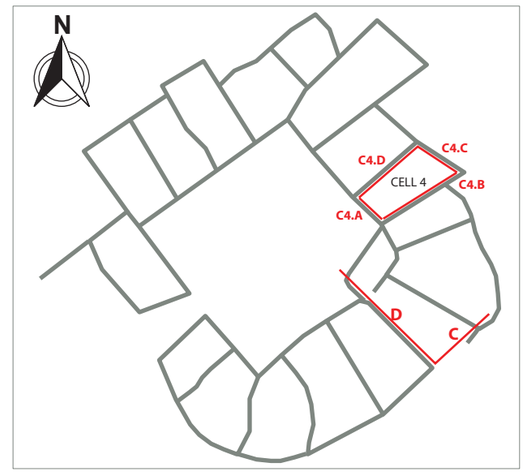
Elevation C4.B: NW facing internal elevation of Cell 4

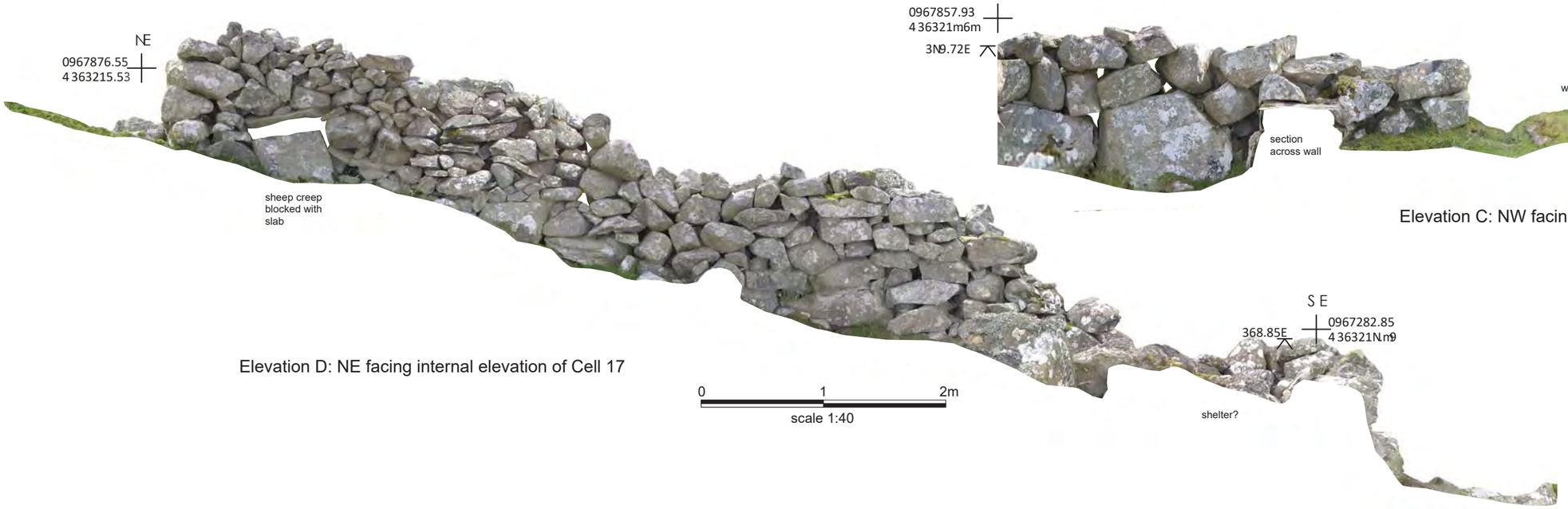


Elevation C4.C: SW facing internal elevation of Cell 4



Elevation C4.D: SE facing internal elevation of Cell 4

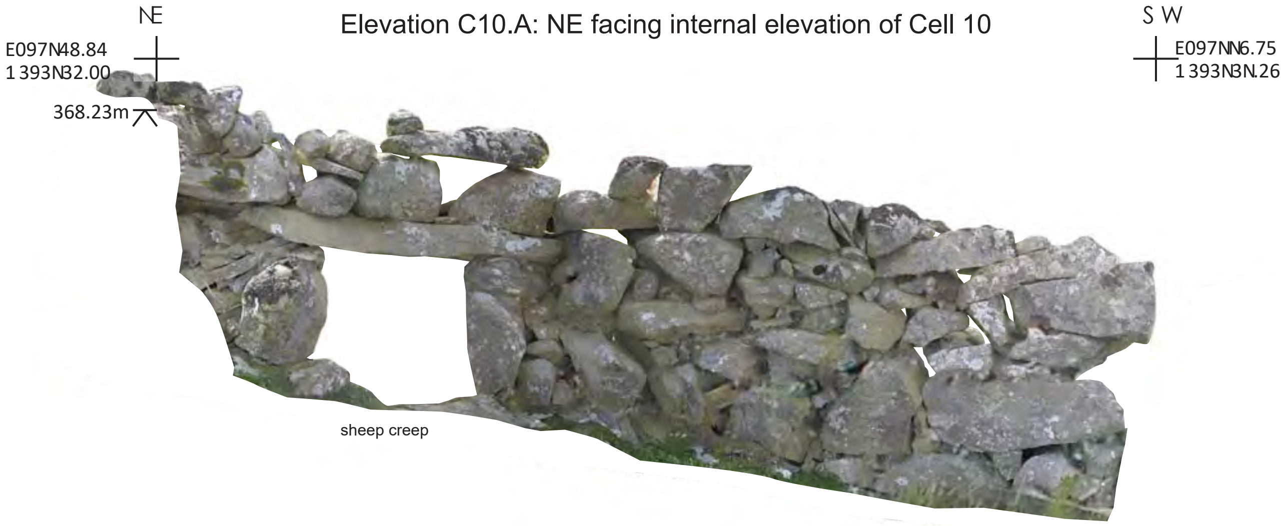




Elevation D: NE facing internal elevation of Cell 17

Elevation C: NW facing internal elevation of Cells 6 and 17

Figure 09. Interior elevations of Cell 4 and interior elevations in Cell 17 in Sheepfold PRN 29989 (scale 1:40)



Elevation C10.A: NE facing internal elevation of Cell 10

Elevation C10.B: SE facing internal elevation of Cell 10

0 1 2m
scale 1:40

Elevation C10.C: SW facing internal elevation of Cell 10

0 1 2m
scale 1:40

Elevation C10.D: W facing internal elevation of Cell 10

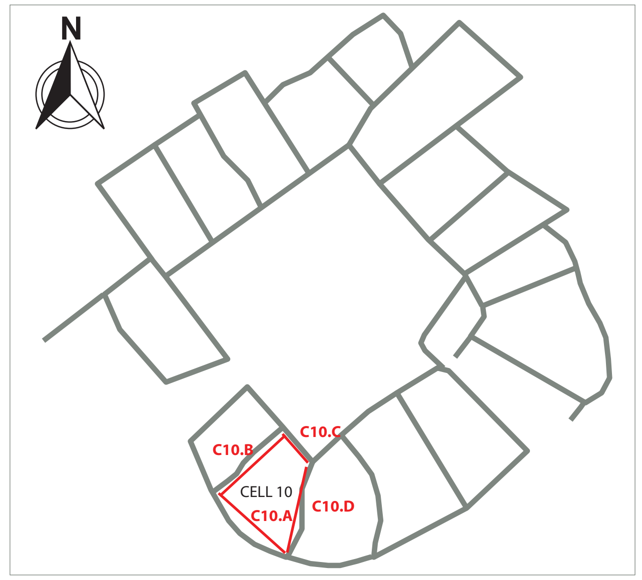
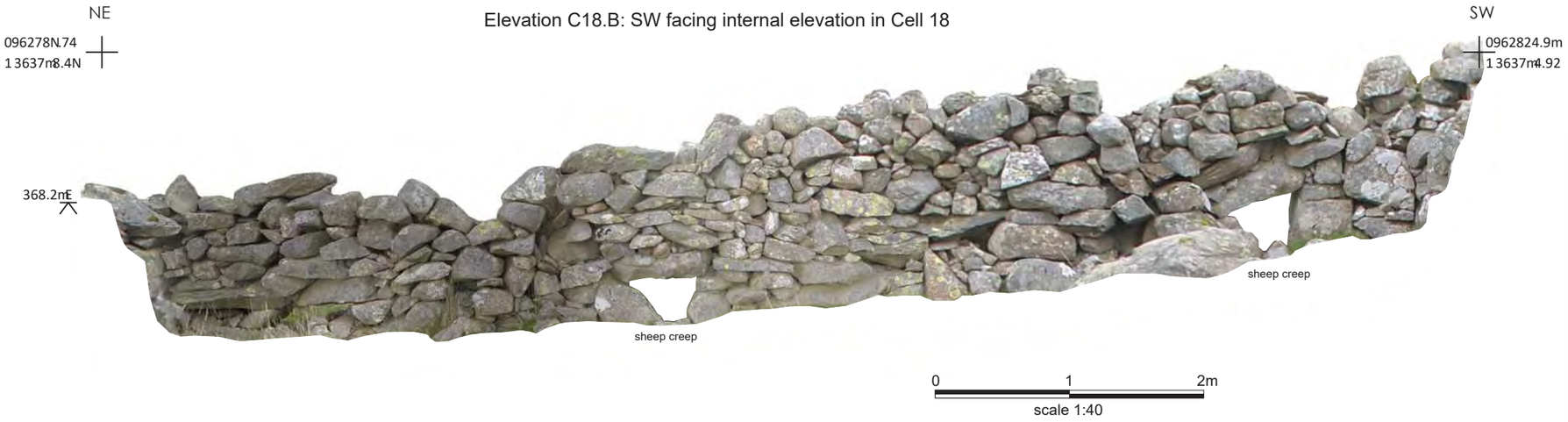
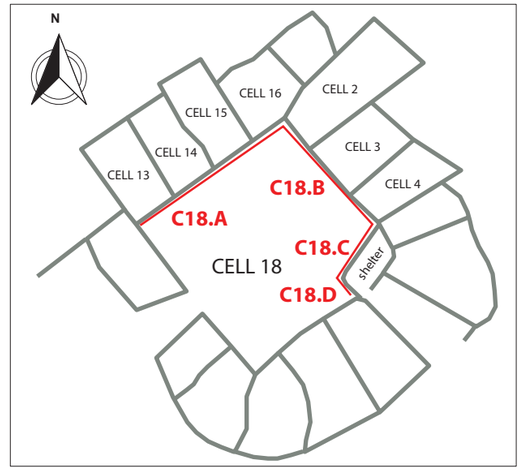


Figure 10. Interior elevations of Cell 10 in Sheepfold PRN 29989 (scale 1:40)

Elevation C18.A: SE facing internal elevation in Cell 18

Elevation C18.B: SW facing internal elevation in Cell 18





Elevation C18.C: WNW facing internal elevation in Cell 18 (exterior of shelter)

Elevation C18.D: SW facing internal elevation in Cell 18 (exterior of shelter)

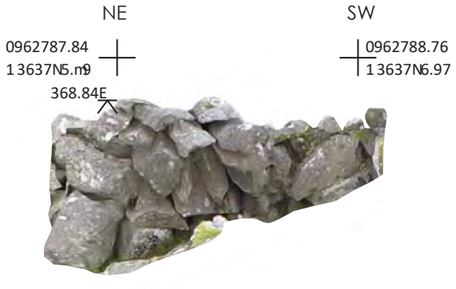
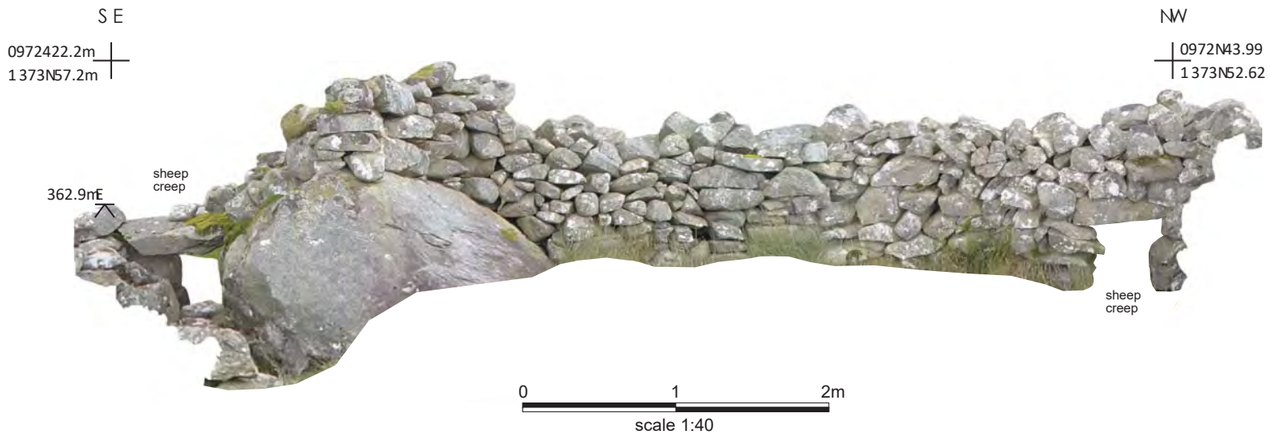
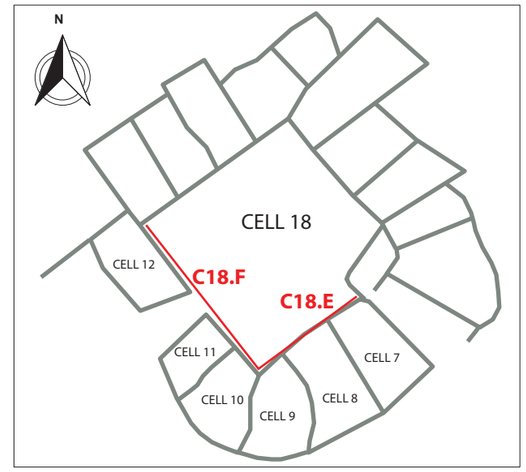


Figure 11. Interior elevations of central pen (Cell 18) in sheepfold PRN 29989 (scale 1:40)

Heneb

Elevation C18.E: NW facing internal elevation in Cell 18





Elevation C18.F: NE facing internal elevation in Cell 18

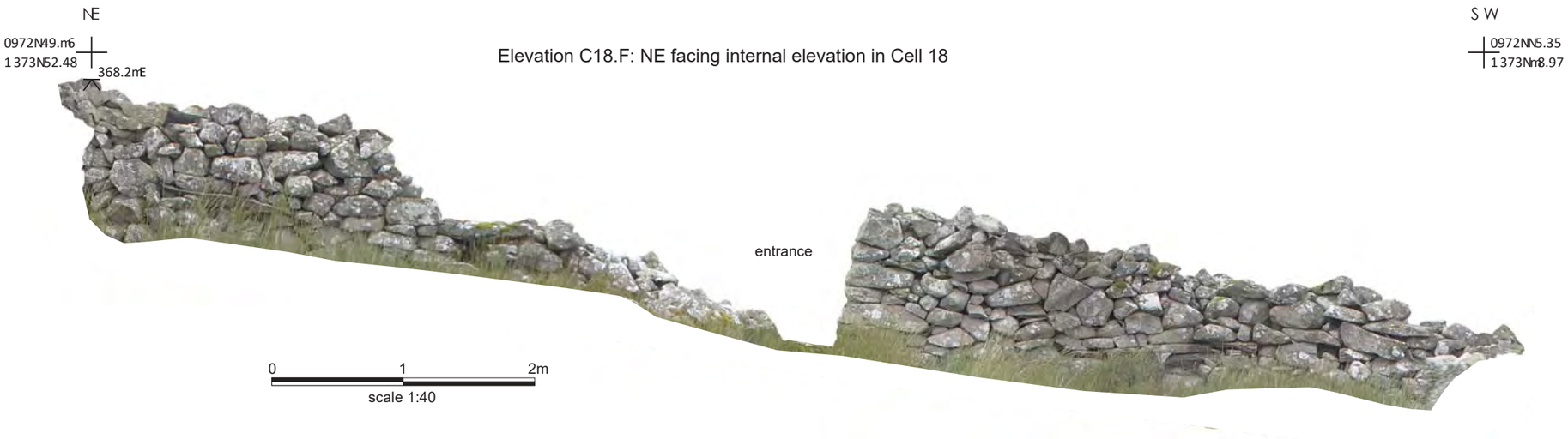
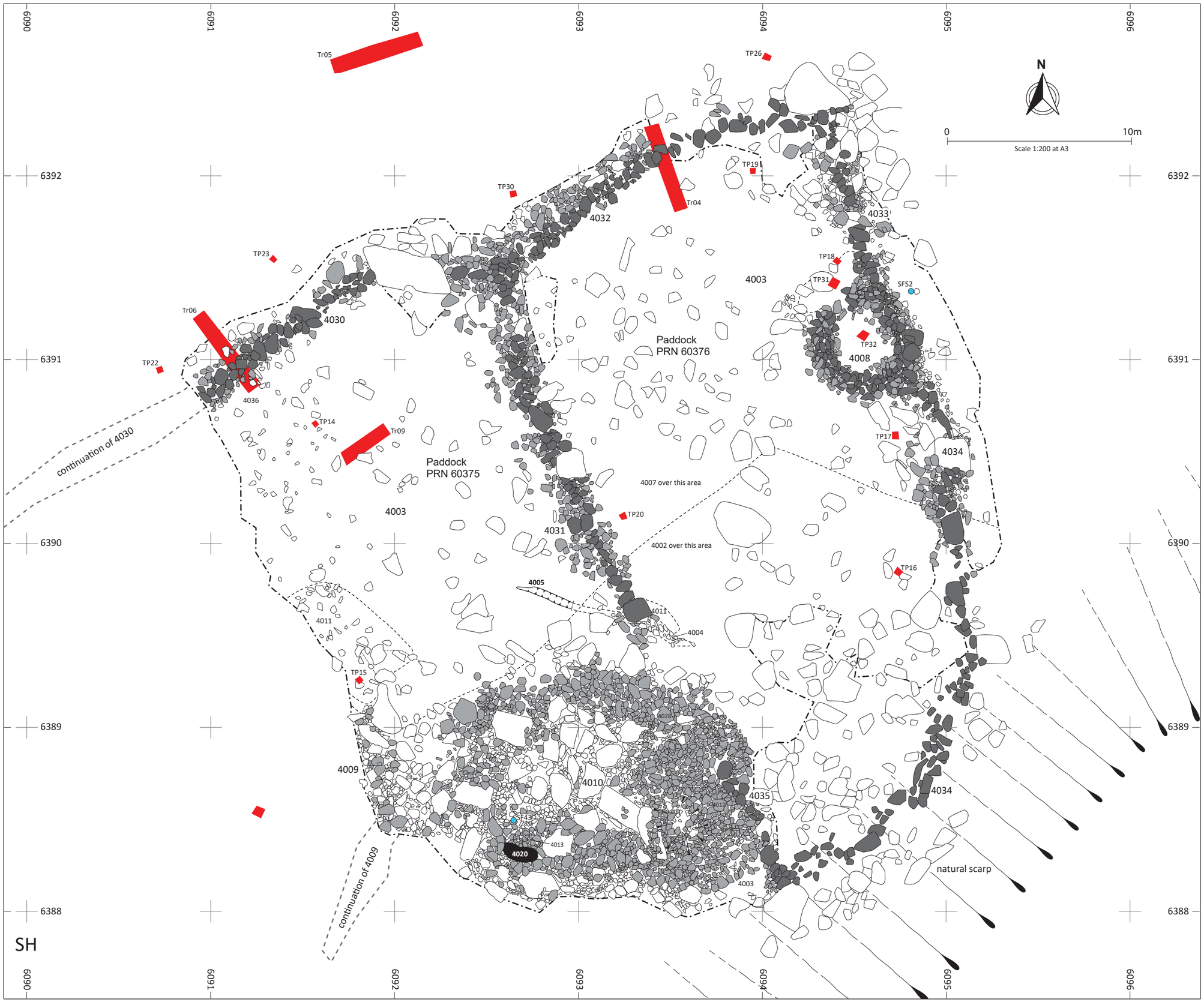


Figure 12. Interior elevations of central pen (Cell 18) in sheepfold PRN 29989 (scale 1:40)



Key

- Boulders and undisturbed stones
- Largely *in situ* wall stones
- Stones dumped or slipped from walls
- Boulder set on end
- Limit of targeted excavation trench
- Limit of deposit
- Cut feature
- Test pit from evaluation phase
- Trench from evaluation phase
- Small finds (for slag see fig ??)

Figure 13. Plan of targeted excavation showing paddock walls and locations of evaluation trenches and test pits (scale 1:200 at A3)

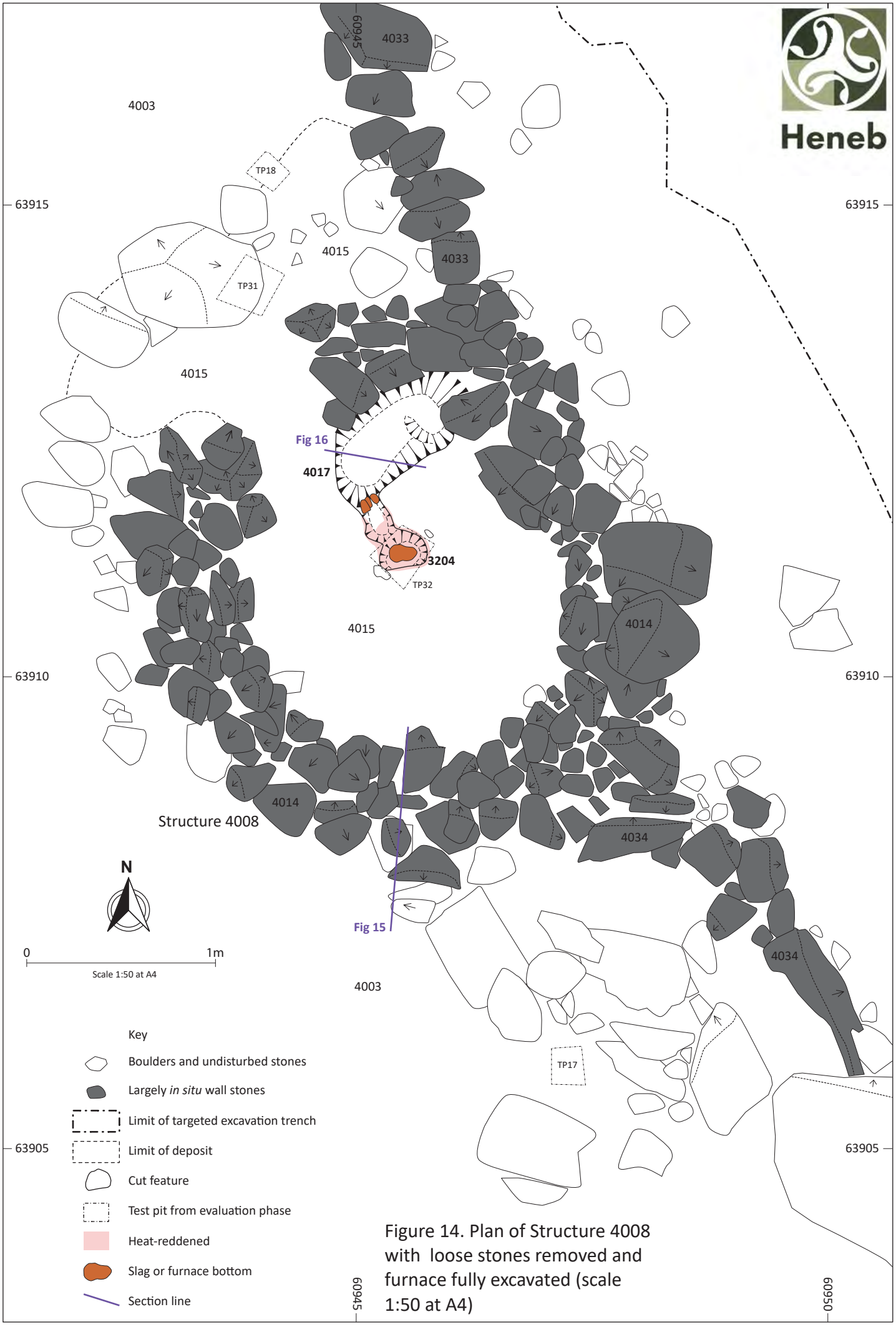


Figure 14. Plan of Structure 4008 with loose stones removed and furnace fully excavated (scale 1:50 at A4)

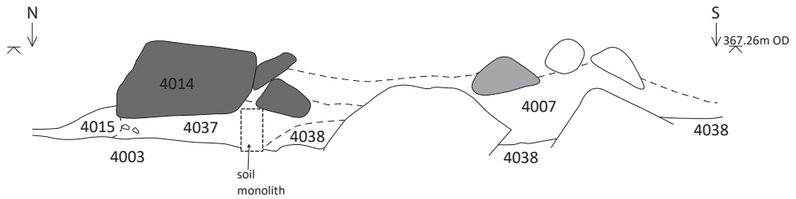
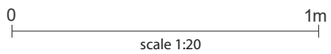


Figure 15. West facing section through Wall 4014 of Structure 4008
(scale 1:20 at A3)



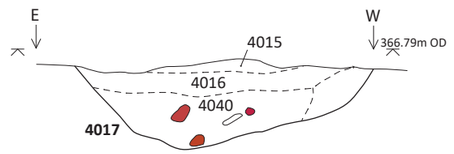
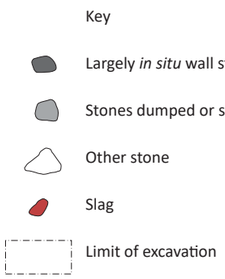


Figure 16. North facing section through Pit 4017
(scale 1:20 at A3)



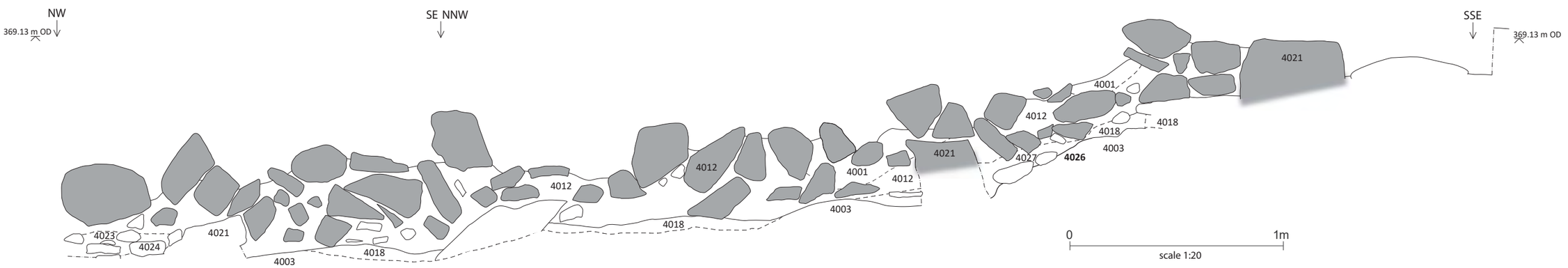


Figure 17. West-south-west facing section through Stones 4012 in Feature 4010
(scale 1:20 at A3)

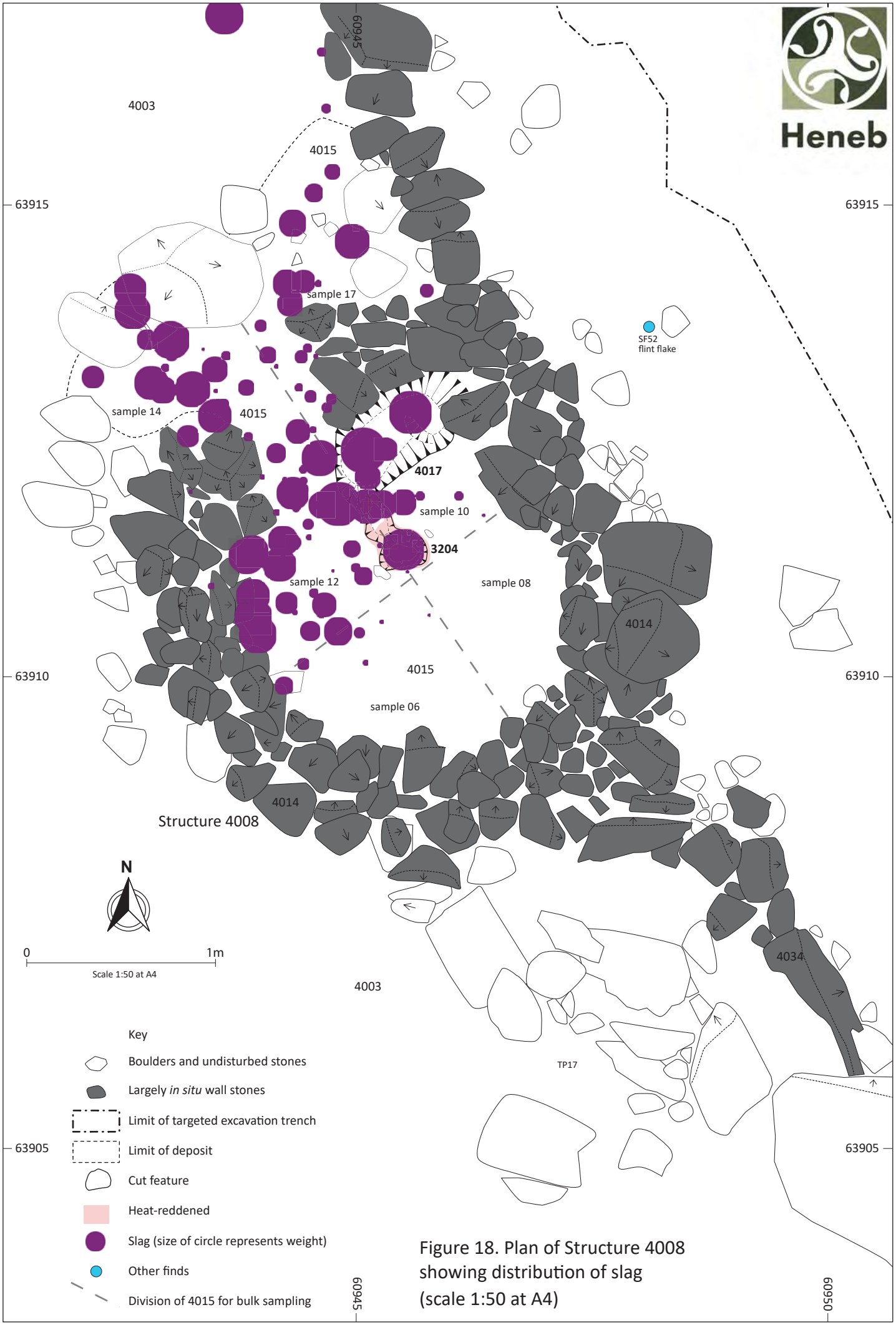


Figure 18. Plan of Structure 4008 showing distribution of slag (scale 1:50 at A4)

Figure 19. Plan of Structure 4010 with some stones removed to expose lower layers (scale 1:100 at A4)

PLATES

Plate 01. View of site with sheepfold PRN 29,989 in foreground and paddocks (PRN 5380) behind, on edge of Penrhyn Quarry. View from south-west (archive reference: G2534_UAS_0887)

Plate 02. View over site across northern end of Gwaen Gynfi, showing limits of the drier land on which the site is located. View from south-south-west (archive reference: G2534_UAS_0888)

Plate 03. Site under excavation with view over Gwaen Gynfi and Moelyci and Parc Drysgol in the background. View from east-south-east (archive reference: G2534_228)

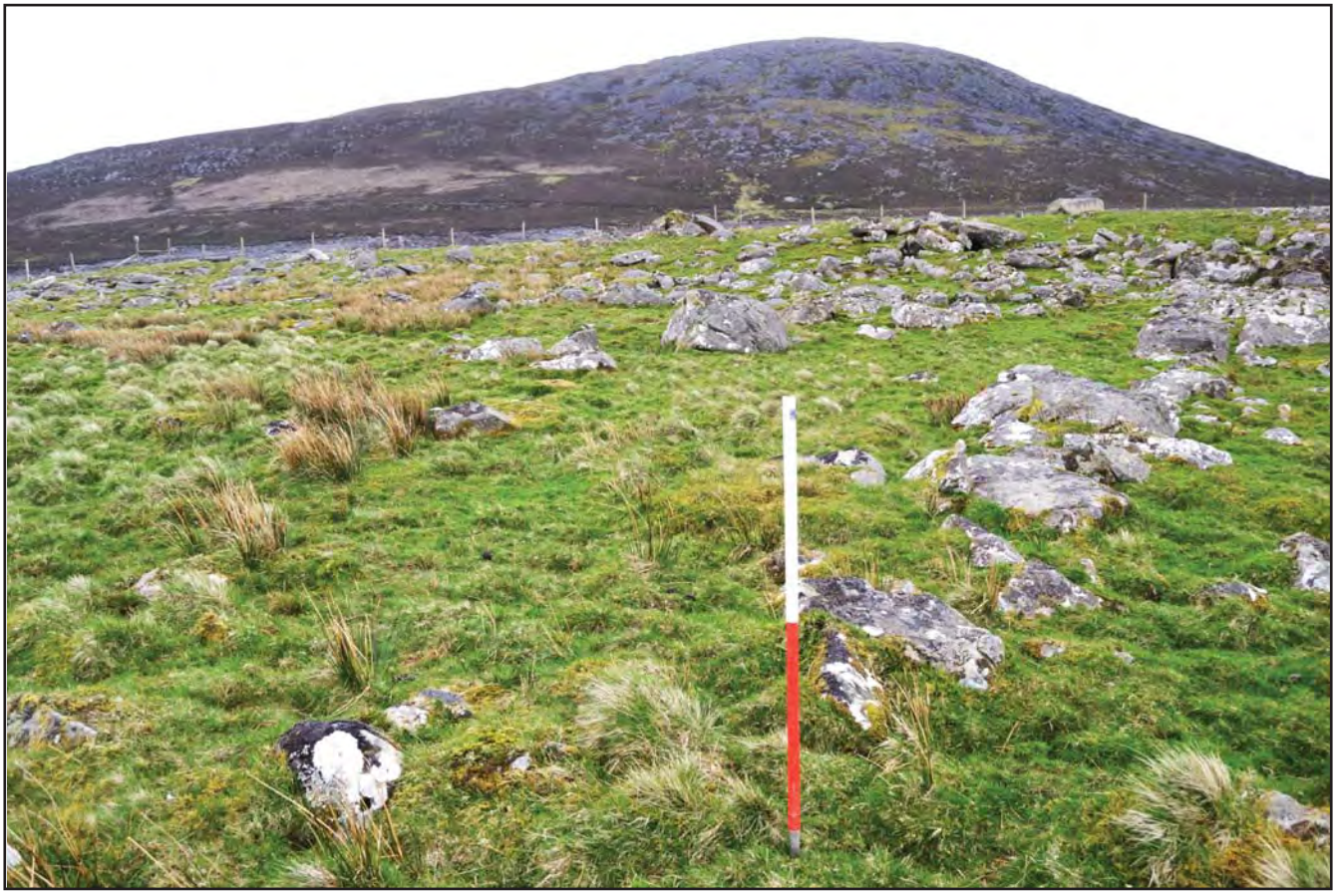


Plate 04. Wall 4031 prior to excavation with Y Fronllwyd in the background showing its extensive boulder fields. View from north-west (archive reference: G2534_213)

Plate 05. Mechanical excavator stripping part of the site, carefully avoiding boulders. View from south-east (archive reference: G2534_222)

Plate 06. Hand clearing turf over Structure 4010. View from east (archive reference: G2534_218)

Plate 07. Drone view of sheepfold with paddocks in front. View from north-east (archive reference: G2534_UAS_0896)

Plate 08. Drone view of paddocks before excavation with stone heap (PRN 60387) lower centre, also showing the extent of the boulder fields. View from south-east (archive reference: G2534_UAS_0895)

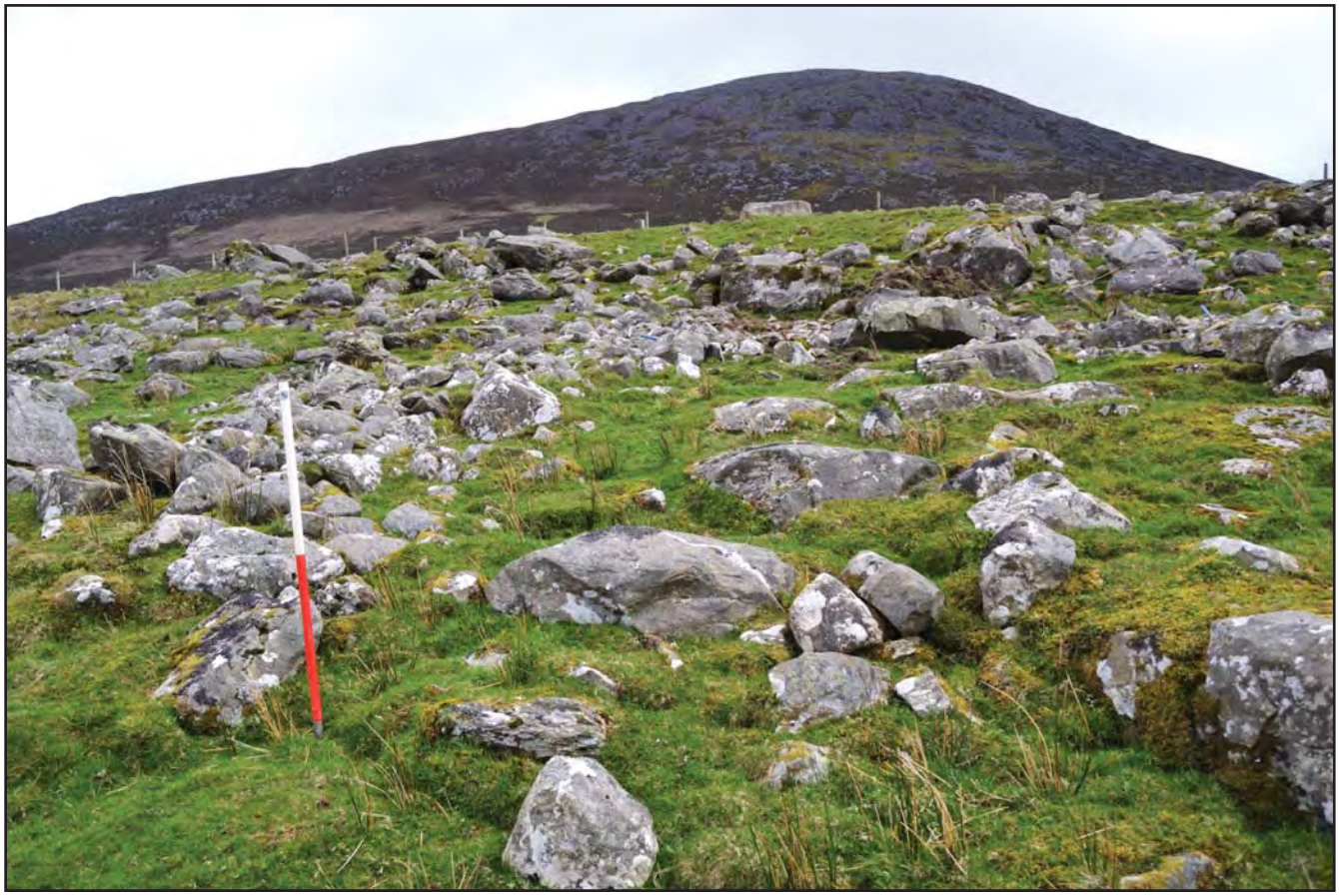


Plate 09. Part of stone heap (PRN 60387 (Structure 4010)) prior to excavation. View from north-west (archive reference: G2534_215)

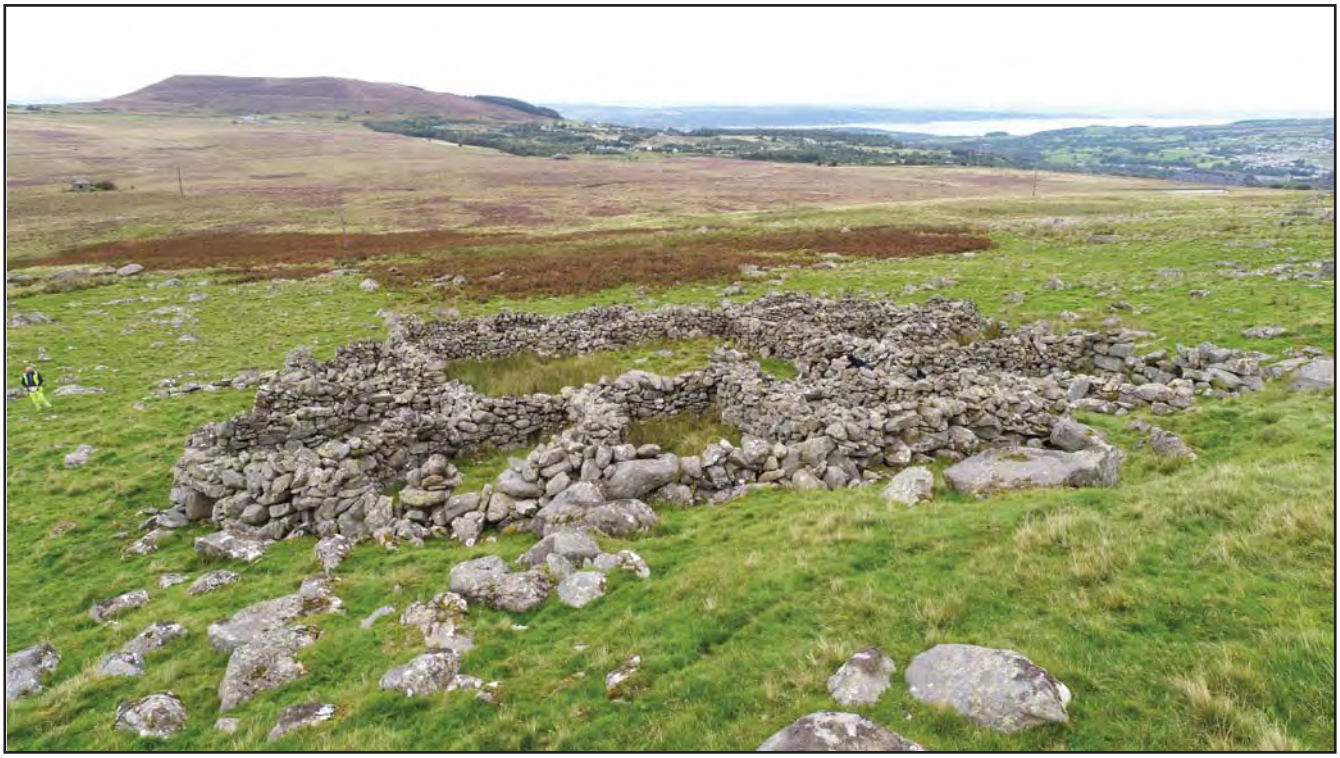


Plate 10. Sheepfold (PRN 29989) looking out over Gwaen Gynfi. View from south (archive reference: G2534_UAS_3412)

Plate 11. Drone view of sheepfold (PRN 29989). View from west
(archive reference: G2534_UAS_0885)

Plate 12. Inner wall of Cell 7 built over large boulder. View from south-east, scale 1m
(archive reference: G2534_2023_139)

Plate 13. Funnel-shaped entrance into the sheepfold. View from south-west, scale 1m (archive reference: G2534_2023_225)

Plate 14. Interior of small structure in corner of central pen. View from east, scale 1m (archive reference: G2534_2023_1006)

Plate 15. Exterior of small structure in corner of central pen. View from north-west, scale 1m (archive reference: G2534_2023_179)

Plate 16. Erratic boulder used as part of wall of Cell 11. View from north-west, scale 1m (archive reference: G2534_2023_111)

Plate 17. Wall of Cell 7, where large boulders have been used to build the wall. View from north-west, scale 1m (archive reference: G2534_2023_136)

Plate 18. Wall of Cell 8, relatively well-built. View from north-east, scale 1m
(archive reference: G2534_2023_134)

Plate 19. Wall of Cell 6; haphazardly built. View from south, scale 1m (archive reference: G2534_2023_1005)

Plate 20. Sheep creep from Cell 10 to exterior of sheepfold; a particularly substantial example. View from south, scale 1m (archive reference: G2534_2023_184)

Plate 21. Sheep creep from Cell 3 to exterior of sheepfold; a relatively tall sheep creep blocked with stones. View from north-east, scale 1m (archive reference: G2534_2023_209)

Plate 22. Sheep creep from Cell 7 into Cell 17 with stone slab blocking. View from north-east, scale 1m (archive reference: G2534_2023_191)

Plate 23. Sheep creep from Cell 11 into Cell 10 blocked with small stones. View from north-west, scale 1m (archive reference: G2534_2023_112)

Plate 24. Denuded wall, probably remains of an earlier larger cell. View from south-east, scale 1m (archive reference: G2534_2023_226)

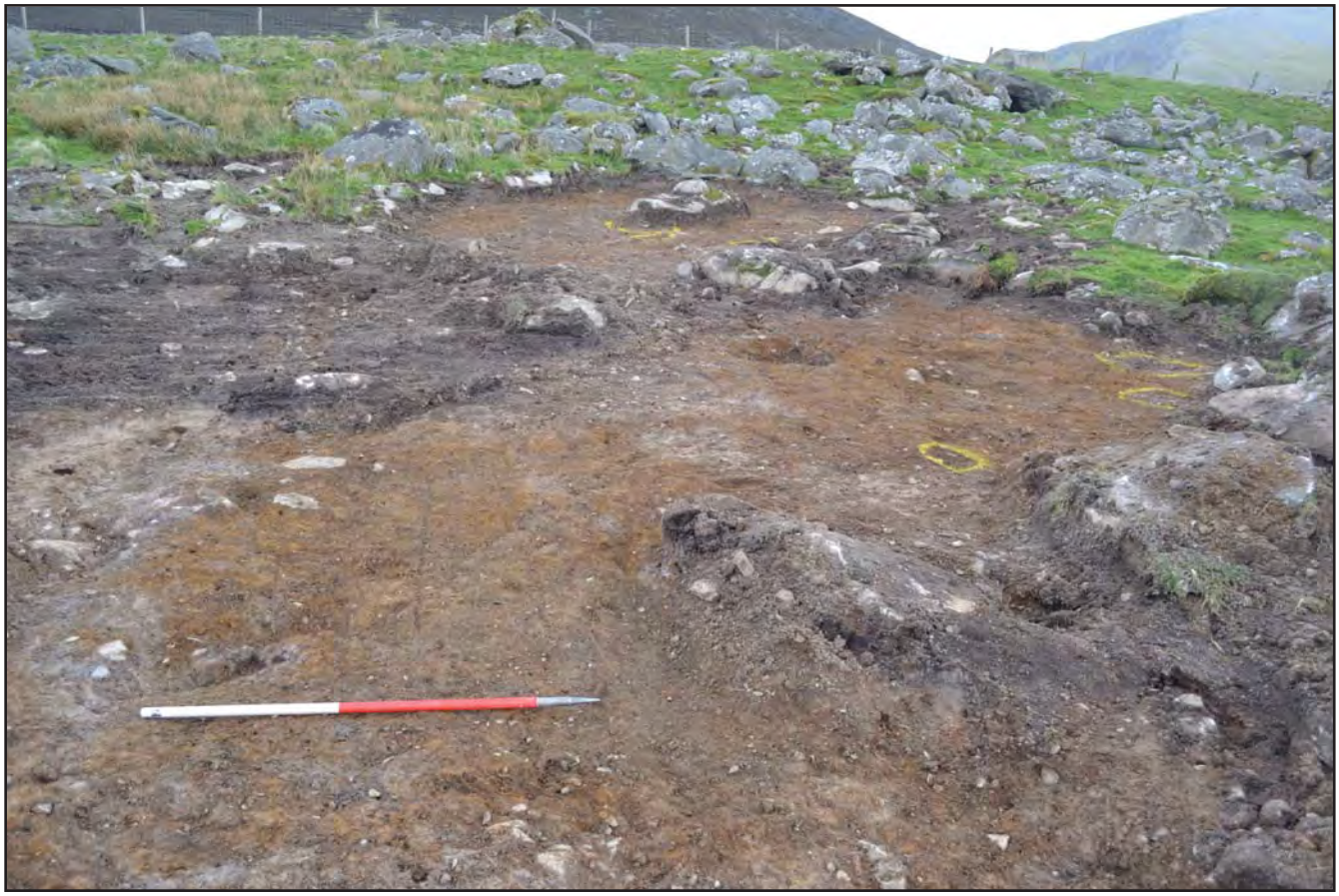


Plate 25. Surface of the natural glacial deposits (4003). View from north-west, scale 1m (archive reference: G2534_219)

Plate 26. View of targeted excavation showing numerous boulders. View from south-west (archive reference: G2534_227)

Plate 27. Buried soil horizon (4011) on western limit of targeted excavation. View from west, scale 1m (archive reference: G2534_235)

Plate 28. Buried soil horizon (4018) below stone heap 4010 (on left side), with stones of deposit 4024 on right side. View from north, scale 1m (archive reference: G2534_268)

Plate 29. Wall 4030. View from south-west, scale 1m (archive reference: G2534_314)

Plate 30. Wall 4030. View from south-west, scale 1m (archive reference: G2534_312)

Plate 31. Wall 4031. View from north, scale 1m (archive reference: G2534_322)

Plate 32. The large boulder at the south-eastern end of Wall 4031. View from east, scale 1m (archive reference: G2534_351)

Plate 33. Wall 4035, partly covered by stones of 4012 and 4028. View from south-east, scale 1m (archive reference: G2534_346)

Plate 34. Wall 4034 outside excavated area with stones projecting through the turf. View from north, scale 1m (archive reference: G2534_341)

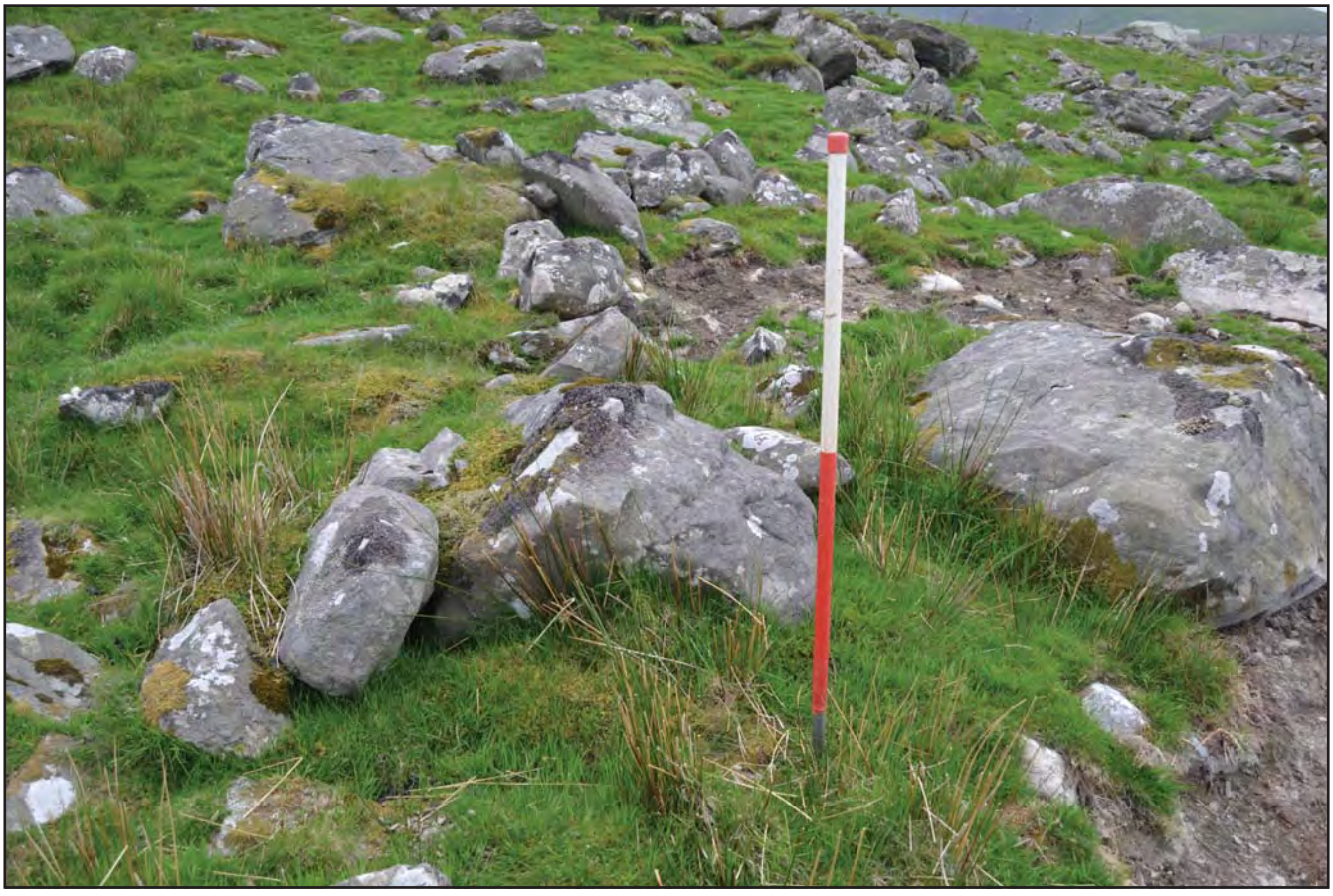


Plate 35. Wall 4033 immediately north of Structure 4008. View from north, scale 1m (archive reference: G2534_338)

Plate 36. Wall 4033 running over large, natural boulders. View from south, scale 1m (archive reference: G2534_337)

Plate 37. Wall 4032. View from south-west, scale 1m (archive reference: G2534_324)

Plate 38. Wall 4032. View from north-west, scale 1m (archive reference: G2534_325)

Plate 39. Gully 4005 as first exposed with fill (4004). View from west, scale 1m (archive reference: G2534_223)

Plate 40. Gully 4005 partially excavated showing section. View from west-north-west, scale 1m (archive reference: G2534_374)

Plate 41. Stones 4009, interpreted as being a rough line of stones of natural origin. View from south, scale 2x1m (archive reference: G2534_255)

Plate 42. Structure 4008 before slipped/disturbed stones were removed. View from south, scale 1m (archive reference: G2534_252)

Plate 43. Structure 4008 before slipped/disturbed stones were removed. View from east-north-east, scale 1m (archive reference: G2534_279)

Plate 44. Entrance to Structure 4008 after loose stones have been removed. View from north-west, scale 1m (archive reference: G2534_367)

Plate 45. Pit [4017] with channel to furnace base [3204]. View from south-west, scale 1m (archive reference: G2534_360)

Plate 46. Furnace base [3204]. View from west-south-west (archive reference: G2534_365)

Plate 47. North-north-east facing section across Pit [4017]. View from north-north-east, scale 1m (archive reference: G2534_357)

Plate 48. Slag lumps (4041) possibly forming a blocking across the channel from the furnace. View from north-west (archive reference: G2534_366)

Plate 49. Stones (4039) slumping into the top of Pit 4017. View from south, scale 1m (archive reference: G2534_356)

Plate 50. Northern end of Wall 4034, where it joins Structure 4008. View from south-south-east, scale 1m (archive reference: G2534_372)

Plate 51. Spread of stones Group 4010. View from south-east, scales 2x1m (archive reference: G2534_253)

Plate 52. Stones 4012, part of 4010, with hollow in the middle. View from west, scale 1m (archive reference: G2534_247)

Plate 53. Part of the hollow in stone spread 4028 with smaller stones (4013) in the middle and large stone on edge (4020). View from north, scale 1m (archive reference: G2534_239)

Plate 54. South-west facing section through stone deposit 4012. View from south-west, scale 1m (archive reference: G2534_298)

Plate 55. South-west facing section across scarp [4026]. View from south-west, scale 1m

(archive reference: G2534_300)

Plate 56. Stones 4021, some slumped, some *in situ* with blasted boulder 4025. View from south, scale 1m (archive reference: G2534_269)

Plate 57. Blasted boulders 4025 and 4029. View from south-east, scale 1m (archive reference: G2534_310)

Plate 58. Blasted boulder 4029. View from north-north-west, scale 1m (archive reference: G2534_243)

Plate 59. Section through hollow forming part of 4024. View from south, scale 1m (archive reference: G2534_296)

Plate 60. Natural boulder resting on end (4020) with sondage dug to prove that it is embedded in the natural clay. View from north-north-west, scale 1m (archive reference: G2534_275)

Plate 61. Boulder 4020 with relict soil deposit 4019 and stones 4022, View from north, scale 1m (archive reference: G2534_273)

APPENDIX I

List of Contexts

Context No.	Type	Group	Description
3204	Cut	4008	Cut for furnace, dug in evaluation and recorded in mitigation
4001	Deposit		Topsoil
4002	Deposit		B horizon
4003	Deposit		Natural
4004	Fill		Fill of linear feature
4005	Cut		Cut of linear feature
4006	Deposit		Pale silt under topsoil
4007	Deposit	4010	Degraded peat
4008	Group		Group number for structure with metal-working
4009	Structure		Potential curving wall, actually natural line of stones
4010	Group		Group number for large area of stone
4011	Deposit	4010	Patches of buried soil
4012	Deposit	4010	Stones in south part of 4010
4013	Deposit	4010	Smaller stones in northern part of 4010
4014	Structure	4008	Wall of Group 4008 structure
4015	Deposit	4008	Occupation layer within Group 4008, below peat layer 4007
4016	Fill	4008	Fill of pit within Group 4008
4017	Cut	4008	Cut of pit within Group 4008
4018	Deposit	4010	Buried soil under 4012
4019	Deposit	4010	Buried soil under 4013
4020	Structure	4010	Upright boulder resembling an orthostat
4021	Deposit	4010	Stones under 4012, considered as possible remains of roundhouse wall.
4022	Deposit	4010	Stones under 4013
4023	Deposit	4010	Dark charcoal-rich deposit under 4012
4024	Deposit	4010	Flat stones under 4012
4025	Deposit	4010	Possibly pieces of blasted boulder
4026	Cut	4010	Possible cut, erosion event
4027	Deposit	4010	Slumped erosion deposits filling 4026
4028	Deposit	4010	Larger stones within northern part of 4010
4029	Deposit	4010	Blasted boulder
4030	Structure	4008	Wall constructed of sub-rounded stones and boulders
4031	Structure	4008	Wall constructed of sub-rounded stones and boulders
4032	Structure	4008	Wall constructed of sub-rounded stones and boulders
4033	Structure	4008	Wall constructed of sub-rounded stones and boulders
4034	Structure	4008	Wall constructed of sub-rounded stones and boulders
4035	Structure	4008	Wall constructed of sub-rounded stones and boulders
4036	Deposit	4008	Colluvial deposit under wall 4030

Context No.	Type	Group	Description
4037	Deposit	4008	Buried soil below 4014
4038	Deposit	4008	Lower soil horizon under 4037
4039	Deposit	4008	Stones slipping into 4017
4040	Deposit	4008	Charcoal-rich lower fill of 4017
4041	Deposit	4008	Slag/furnace lining forming barrier?
4042	Deposit	4008	Furnace bottom in pit 3204
4043	Deposit	4008	Stones slumped from wall 4014

APPENDIX II

Lists of Artefacts and Ecofacts

Artefacts

Find No.	Context No.	Context Description	Material	Description	No. of objects	Weight (g)
1	4006	Modern silt run-off	Slag	Pieces of slag	2	14
2	4006	Modern silt run-off	Slag	Chunk of slag	1	24
3	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	3	27
4	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	4	82
5	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	2	50
6	4006	Modern silt run-off	Slag	Pieces of slag	6	97
7	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	5	204
8	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	3	52
9	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	3	45
10	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	2	17
11	4006	Modern silt run-off	Slag	Pieces of slag	1	42
12	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	2	513
13	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	2	76
14	4006	Modern silt run-off	Slag	Pieces of slag	3	86
15	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	1	30
16	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	2	61
17	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	9	210
18	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	1	15
19	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	1	26
20	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	1	9
21	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	5	74
22	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	1	8
23	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	1	29
24	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	1	90
25	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	1	47
26	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	3	75
27	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	4	42
28	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	2	28
29	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	1	501
30	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	2	24
31	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	2	28
32	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	1	27
33	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	4	53
34	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	1	93
35	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	4	39
36	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	2	54
37	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	1	66

Find No.	Context No.	Context Description	Material	Description	No. of objects	Weight (g)
38	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	7	105
39	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	5	63
40	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	2	18
41	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	3	124
42	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	19	438
43	4002	Subsoil	Stone	Stone tool	1	132
44	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	15	345
45	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	7	43
46	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	2	34
47	4006	Modern silt run-off	Slag	Pieces of slag	9	235
48	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	1	4
49	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	10	130
50	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	18	306
51	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	14	468
52	4007	Peat, finds at interface with 4015	Flint	Flint flake	1	9
53	4007	Peat, finds at interface with 4015	Slag	1 piece of slag	1	5
54	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	17	233
55	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	5	21
56	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	52	816
57	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	22	310
58	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	30	641
59	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	30	688
60	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	45	560
61	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	31	620
62	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	21	1077
63	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	12	443
64	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	15	792
65	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	4	104
66	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	4	68
67	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	12	260
68	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	12	425
69	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	3	327
70	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	16	668
71	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	6	755
72	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	20	615
73	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	16	333
74	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	13	261
75	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	52	728
76	4007	Peat, finds at interface with 4015	Stone	Vitrified rock	1	8
77	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	15	163
78	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	5	60
79	TP32	Backfill of test pit	Slag	Pieces of slag	10	98
80	4016	fill of channel	Slag	Pieces of slag	10	145

Find No.	Context No.	Context Description	Material	Description	No. of objects	Weight (g)
81	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	3	810
82	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	5	801
83	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	22	742
84	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	1	66
85	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	9	332
86	4007	Peat, finds at interface with 4015	Slag	Pieces of slag	3	49
87	4015	Occupation layer	Slag	Pieces of slag	2	19
88	4015	Occupation layer	Slag	Pieces of slag	1	65
89	4015	Occupation layer	Slag	Pieces of slag	5	65
90	4015	Occupation layer	Slag	Pieces of slag	15	353
91	4015	Occupation layer	Slag	Pieces of slag	23	420
92	4015	Occupation layer	Slag	Pieces of slag	18	234
93	4015	Occupation layer	Slag	Pieces of slag	9	107
94	4015	Occupation layer	Slag	Pieces of slag	17	252
95	4015	Occupation layer	Slag	Pieces of slag	29	410
96	4015	Occupation layer	Slag	Pieces of slag	20	240
97	4015	Occupation layer	Slag	Pieces of slag	2	825
98	4015	Occupation layer	Slag	Pieces of slag	33	665
99	4015	Occupation layer	Slag	Pieces of slag	30	794
100	4015	Occupation layer	Slag	Pieces of slag	19	163
101	4015	Occupation layer	Slag	Pieces of slag	12	210
102	4015	Occupation layer	Slag	Pieces of slag	39	460
103	4015	Occupation layer	Slag	Pieces of slag	19	408
104	4015	Occupation layer	Slag	Pieces of slag	8	165
105	4015	Occupation layer	Slag	Pieces of slag	42	679
106	4015	Occupation layer	Slag	Pieces of slag	5	782
107	4015	Occupation layer	Slag	Pieces of slag	28	825
108	4015	Occupation layer	Slag	Furnace lining	1	8
109	4015	Occupation layer	Slag	Pieces of slag	2	134
110	4015	Occupation layer	Slag	Pieces of slag	16	510
111	4015	Occupation layer	Slag	Pieces of slag	10	480
112	4015	Occupation layer	Slag	Pieces of slag	11	583
113	4040	Fill of tapping pit	Slag	Pieces of slag	22	1018
114	4042	Furnace bottom	Slag	Furnace bottom	4	1000
115	4040	Fill of tapping pit	Slag	Pieces of slag	15	1130
116	4041	Channel blocking	Slag	Pieces of slag	15	718

Ecofacts

Sample No.	Context No.	Context Type	Sample type	No. of tubs
1	3203	Fill of pit [3204], smelting pit (excavated in base of test pit 32)	Bulk soil sample	
2	4016	Fill of feature [4017] within Group 4008	Bulk soil sample	2
3	4023	Dark deposit under 4012, with some charcoal, buried soil	Bulk soil sample	1
4	4018	Grey soil under 4012, buried soil	Bulk soil sample	1
5	4015	Probable occupation layer within Group 4008	Bag of soil for possible Chemical Analysis	1 bag
6	4015	Probable occupation layer within Group 4008	Bulk soil sample	1
7	4015	Probable occupation layer within Group 4008	Bag of soil for possible Chemical Analysis	1 bag
8	4015	Probable occupation layer within Group 4008	Bulk soil sample	1
9	4015	Probable occupation layer within Group 4008	Bag of soil for possible Chemical Analysis	1 bag
10	4015	Probable occupation layer within Group 4008	Bulk soil sample	1
11	4015	Probable occupation layer within Group 4008	Bag of soil for possible Chemical Analysis	1 bag
12	4015	Probable occupation layer within Group 4008	Bulk soil sample	1
13	4015	Probable occupation layer within Group 4008	Bag of soil for possible Chemical Analysis	1 bag
14	4015	Probable occupation layer within Group 4008	Bulk soil sample	1
15	4040	Charcoal-rich layer in feature [4017]	Bulk soil sample	3
16	4015	Probable occupation layer within Group 4008	Bag of soil for possible Chemical Analysis	1 bag
17	4015	Probable occupation layer within Group 4008	Bulk soil sample	1
18	4037 and 4038	Buried soil below 4014 and Lower soil horizon under 4037	Soil monolith	1 monolith

APPENDIX III

Photographic Metadata

Photo Record Number	Description	View from	Scale(s)	Taken by	Taken on
G2534_213	Pre-start shots. NW corner of feature 5	NW	1x1m	Jane Kenney	15/04/2024
G2534_214	Pre-start shots. NW corner of feature 5	SW	1x1m	Jane Kenney	15/04/2024
G2534_215	Pre-start shot. SE corner of feature 4	NW	1x1m	Jane Kenney	15/04/2024
G2534_216	De-turfing possible roundhouse in SE corner of feature 4	NE	n/a	Jane Kenney	15/04/2024
G2534_217	De-turfing possible roundhouse in SE corner of feature 4	E	n/a	Jane Kenney	15/04/2024
G2534_218	De-turfing possible roundhouse in SE corner of feature 4, sheepfold behind	E	n/a	Jane Kenney	15/04/2024
G2534_219	Areas of natural in feature 5 as first exposed and cleaned up	NW	1x1m	Jane Kenney	16/04/2024
G2534_220	Areas of natural in feature 5 as first exposed and cleaned up, with digger	SE	1x1m	Jane Kenney	16/04/2024
G2534_221	Areas of natural in feature 5 as first exposed and cleaned up	SE	1x1m	Jane Kenney	16/04/2024
G2534_222	Areas of natural in feature 5 as first exposed and cleaned up, with digger	SE	1x1m	Jane Kenney	16/04/2024
G2534_223	Pre-ex shot of linear feature [4005]	W	1x1m	Jane Kenney	17/04/2024
G2534_224	Pre-ex shot of linear feature [4005]	E	1x1m	Jane Kenney	17/04/2024
G2534_225	Working shot at end of first week	SE	n/a	Jane Kenney	19/04/2024
G2534_226	Working shot at end of first week	S	n/a	Jane Kenney	19/04/2024
G2534_227	Working shot at end of first week	SW	n/a	Jane Kenney	19/04/2024
G2534_228	Working shot at end of first week	E	n/a	Jane Kenney	19/04/2024
G2534_229	Shot of feature 4008	NW	2x1m	Stuart Murphy	30/04/2024
G2534_230	Shot of feature 4008	W	2x1m	Stuart Murphy	30/04/2024
G2534_231	Shot of feature 4008	SE	2x1m	Stuart Murphy	30/04/2024

Photo Record Number	Description	View from	Scale(s)	Taken by	Taken on
G2534_232	Shot of feature 4008	NE	2x1m	Stuart Murphy	30/04/2024
G2534_233	Patches of 4011 to the North of wall 4009	NNW	1x1m	Jane Kenney	01/05/2024
G2534_234	Patches of 4011 to the North of wall 4009	NNW	1x1m	Jane Kenney	01/05/2024
G2534_235	Patches of 4011 to the North of wall 4009	W	1x1m	Jane Kenney	01/05/2024
G2534_236	Wall 4009	NNW	1x1m	Jane Kenney	01/05/2024
G2534_237	Wall 4009	NNW	1x1m	Jane Kenney	01/05/2024
G2534_238	Wall 4009	SSE	1x1m	Jane Kenney	01/05/2024
G2534_239	"Orthostat" in group 4010	N	1x1m	Jane Kenney	01/05/2024
G2534_240	"Orthostat" in group 4010	NNW	1x1m	Jane Kenney	01/05/2024
G2534_241	"Orthostat" in group 4010	NE	1x1m	Jane Kenney	01/05/2024
G2534_242	Split bedrock in group 4010	N	1x1m	Jane Kenney	01/05/2024
G2534_243	Split bedrock in group 4010	NNW	1x1m	Jane Kenney	01/05/2024
G2534_244	Split bedrock in group 4010	E	1x1m	Jane Kenney	01/05/2024
G2534_245	Southern part of group 4010	NNW	1x1m	Jane Kenney	01/05/2024
G2534_246	Southern part of group 4010	NNW	1x1m	Jane Kenney	01/05/2024
G2534_247	Southern part of group 4010	W	1x1m	Jane Kenney	01/05/2024
G2534_248	Structure 4008 with peat 4007 partially overlaying it, from camera pole	NE	2x1m	Jane Kenney	01/05/2024
G2534_249	Structure 4008 with peat 4007 partially overlaying it, from camera pole	NNE	2x1m	Jane Kenney	01/05/2024
G2534_250	Structure 4008 with peat 4007 partially overlaying it, from camera pole	SW	2x1m	Jane Kenney	01/05/2024
G2534_251	Structure 4008 with peat 4007 partially overlaying it, from camera pole	S	2x1m	Jane Kenney	01/05/2024
G2534_252	Structure 4008 with peat 4007 partially overlaying it, from camera pole	S	2x1m	Jane Kenney	01/05/2024
G2534_253	Southern part of stone feature 4010, from camera pole	SE	2x1m	Jane Kenney	01/05/2024

Photo Record Number	Description	View from	Scale(s)	Taken by	Taken on
G2534_254	Northern part of stone feature 4010, from camera pole	S	2x1m	Jane Kenney	01/05/2024
G2534_255	View of wall 4009, from camera pole	S	2x1m	Jane Kenney	01/05/2024
G2534_256	Northern part of stone feature 4010, from camera pole	E	2x1m	Jane Kenney	01/05/2024
G2534_257	Southern part of stone feature 4010, from camera pole	E	2x1m	Jane Kenney	01/05/2024
G2534_258	Southern part of stone feature 4010, from camera pole	E	2x1m	Jane Kenney	09/05/2024
G2534_259	View of thin grey layer and features within 4008	NW	2x1m	Jane Kenney	09/05/2024
G2534_260	View of thin grey layer and features within 4008	NW	2x1m	Jane Kenney	09/05/2024
G2534_261	View of thin grey layer and features within 4008	SW	2x1m	Jane Kenney	09/05/2024
G2534_262	View of thin grey layer and features within 4008	SE	2x1m	Jane Kenney	09/05/2024
G2534_263	View of thin grey layer and features within 4008	NE	2x1m	Stuart Murphy	09/05/2024
G2534_264	View of pits within 4008	S	1x1m	Stuart Murphy	09/05/2024
G2534_265	View of pits within 4008	N	1x1m	Stuart Murphy	09/05/2024
G2534_266	Overhead shot showing close-up of pit features within 4008	vertical	0.3m	Stuart Murphy	09/05/2024
G2534_267	Deposit 4018 under stones 4012	N	1x1m	Jane Kenney	10/05/2024
G2534_268	Deposit 4018 under stones 4012	N	1x1m	Jane Kenney	10/05/2024
G2534_269	Deposit 4018 under stones 4012	S	1x1m	Jane Kenney	10/05/2024
G2534_270	Deposit 4018 under stones 4012	E	1x1m	Jane Kenney	10/05/2024
G2534_271	Deposit 4018 under stones 4012	E	1x1m	Jane Kenney	10/05/2024
G2534_272	Deposit 4019 and stones 4022 within "orthostat" 4020	N	1x1m	Jane Kenney	10/05/2024
G2534_273	Deposit 4019 and stones 4022 within "orthostat" 4020	N	1x1m	Jane Kenney	10/05/2024
G2534_274	Deposit 4019 and stones 4022 within "orthostat" 4020	N	1x1m	Jane Kenney	10/05/2024
G2534_275	"Orthostat" 4020 with sondage showing it embedded into natural	N	1x1m	Jane Kenney	10/05/2024
G2534_276	"Orthostat" 4020 with sondage showing it embedded into natural	N	1x1m	Jane Kenney	10/05/2024
G2534_277	Stones on western side of 4013 showing them stacked up. Part of 4028.	E	1x1m	Jane Kenney	10/05/2024

Photo Record Number	Description	View from	Scale(s)	Taken by	Taken on
G2534_278	Structure 4008 with peat 4007 removed showing pits in interior, from camera pole	NW	2x1m	Jane Kenney	10/05/2024
G2534_279	Structure 4008 with peat 4007 removed showing pits in interior, from camera pole	ENE	2x1m	Jane Kenney	10/05/2024
G2534_280	Structure 4008 with peat 4007 removed showing pits in interior, from camera pole	ENE	2x1m	Jane Kenney	10/05/2024
G2534_281	Structure 4008 with peat 4007 removed showing pits in interior, from camera pole	SE	2x1m	Jane Kenney	10/05/2024
G2534_282	Structure 4008 with peat 4007 removed showing pits in interior, from camera pole	SW	2x1m	Jane Kenney	10/05/2024
G2534_283	Structure 4008 with peat 4007 removed showing pits in interior, from camera pole (with Stuart digging)	SW	2x1m	Jane Kenney	10/05/2024
G2534_284	Structure 4008, detail of interior, from camera pole	SSE	2x1m	Jane Kenney	10/05/2024
G2534_285	Structure 4008, detail of interior, from camera pole	NE	2x1m	Jane Kenney	10/05/2024
G2534_286	Structure 4008, detail of interior, from camera pole	NE	2x1m	Jane Kenney	10/05/2024
G2534_287	View of stone deposit 4024	NW	1x1m	Jane Kenney	14/05/2024
G2534_288	View of stone deposit 4024	NW	1x1m	Jane Kenney	14/05/2024
G2534_289	View of stone deposit 4024	SE	1x1m	Jane Kenney	14/05/2024
G2534_290	View of stone deposit 4024	E	1x1m	Jane Kenney	14/05/2024
G2534_291	View of probable blasted boulder	E	1x1m	Jane Kenney	14/05/2024
G2534_292	View of probable blasted boulder	E	1x1m	Jane Kenney	14/05/2024
G2534_293	Stones 4021 with possible cut [4026] collapsed	SE	1x1m	Jane Kenney	14/05/2024
G2534_294	Stones 4021 with possible cut [4026] collapsed	E	1x1m	Jane Kenney	14/05/2024
G2534_295	Stones 4021 with possible cut [4026] collapsed	E	1x1m	Jane Kenney	14/05/2024
G2534_296	Hollow part of 4024	W	1x1m	Jane Kenney	14/05/2024
G2534_297	Southwest facing section through 4012, northwest end	SW	1x1m	Jane Kenney	14/05/2024
G2534_298	Southwest facing section through 4012, middle	SW	1x1m	Jane Kenney	14/05/2024

Photo Record Number	Description	View from	Scale(s)	Taken by	Taken on
G2534_299	Southwest facing section through 4012, middle	SW	1x1m	Jane Kenney	14/05/2024
G2534_300	Southwest facing section through 4012, southeast end	SW	1x1m	Jane Kenney	14/05/2024
G2534_301	Stones 4024 with some of the half stones removed to show stones embedded in natural beneath	SW	1x1m	Jane Kenney	15/05/2024
G2534_302	Stones 4024 with some of the half stones removed to show stones embedded in natural beneath	N	1x1m	Jane Kenney	15/05/2024
G2534_303	Stones 4024 with some of the half stones removed to show stones embedded in natural beneath	N	1x1m	Jane Kenney	15/05/2024
G2534_304	Stones 4028 with stone on edge 4020	W	1x1m	Jane Kenney	15/05/2024
G2534_305	Stones 4028	SW	1x1m	Jane Kenney	15/05/2024
G2534_306	Stones 4028	SE	1x1m	Jane Kenney	15/05/2024
G2534_307	Blasted boulder 4029 with stones 4028	NW	1x1m	Jane Kenney	15/05/2024
G2534_308	Blasted boulder 4029 with stones 4028	NE	1x1m	Jane Kenney	17/05/2024
G2534_309	Blasted boulder 4029 with broken pieces 4025	NE	1x1m	Jane Kenney	17/05/2024
G2534_310	Boulder wall	SE	1x1m	Jane Kenney	17/05/2024
G2534_311	Boulder wall	S	1x1m	Mike Tunnicliffe	17/05/2024
G2534_312	Boulder wall	S	1x1m	Mike Tunnicliffe	17/05/2024
G2534_313	Boulder wall	S	1x1m	Mike Tunnicliffe	17/05/2024
G2534_314	Boulder wall	SW	1x1m	Mike Tunnicliffe	17/05/2024
G2534_315	Boulder wall	SW	1x1m	Mike Tunnicliffe	17/05/2024
G2534_316	Boulder wall	SW	1x1m	Mike Tunnicliffe	17/05/2024
G2534_317	Boulder wall	S	1x1m	Mike Tunnicliffe	17/05/2024
G2534_318	Boulder wall	S	1x1m	Mike Tunnicliffe	17/05/2024
G2534_319	Boulder wall	W	1x1m	Mike Tunnicliffe	17/05/2024
G2534_320	Boulder wall	W	1x1m	Mike Tunnicliffe	17/05/2024
G2534_321	Boulder wall	N	1x1m	Mike Tunnicliffe	17/05/2024
G2534_322	Boulder wall	N	1x1m	Mike Tunnicliffe	17/05/2024

Photo Record Number	Description	View from	Scale(s)	Taken by	Taken on
G2534_323	Boulder wall	SW	1x1m	Mike Tunnicliffe	20/05/2024
G2534_324	Boulder wall	SW	1x1m	Mike Tunnicliffe	20/05/2024
G2534_325	Boulder wall	NW	1x1m	Mike Tunnicliffe	20/05/2024
G2534_326	Boulder wall	NW	1x1m	Mike Tunnicliffe	20/05/2024
G2534_327	Boulder wall	NE	1x1m	Mike Tunnicliffe	20/05/2024
G2534_328	Boulder wall	NE	1x1m	Mike Tunnicliffe	20/05/2024
G2534_329	Where boulder wall is built up against large rock	SW	1x1m	Mike Tunnicliffe	20/05/2024
G2534_330	Where boulder wall is built up against large rock	SW	1x1m	Mike Tunnicliffe	20/05/2024
G2534_331	Section 28 of boulder wall	W	1x1m	Mike Tunnicliffe	20/05/2024
G2534_332	Section 28 of boulder wall	W	1x1m	Mike Tunnicliffe	20/05/2024
G2534_333	Northeast end of wall 4032, unexcavated	W	1x1m	Jane Kenney	20/05/2024
G2534_334	Northeast end of wall 4032, unexcavated	W	1x1m	Jane Kenney	20/05/2024
G2534_335	Northeast end of wall 4032 where it meets a large boulder	W	1x1m	Jane Kenney	20/05/2024
G2534_336	North end of wall 4033 with large boulder (number on board is wrong)	S	1x1m	Jane Kenney	20/05/2024
G2534_337	North end of wall 4033 with large boulder (number on board is wrong)	S	1x1m	Jane Kenney	20/05/2024
G2534_338	South end of wall 4033 with wall 4014 in background	N	1x1m	Jane Kenney	20/05/2024
G2534_339	Excavated part of wall 4034	N	1x1m	Jane Kenney	20/05/2024
G2534_340	Excavated part of wall 4034	N	1x1m	Jane Kenney	20/05/2024
G2534_341	Unexcavated part of wall 4034	N	1x1m	Jane Kenney	20/05/2024
G2534_342	Unexcavated part of wall 4034	NE	1x1m	Jane Kenney	20/05/2024
G2534_343	Unexcavated part of wall 4034	NE	1x1m	Jane Kenney	20/05/2024
G2534_344	Wall 4035 with 4012 to left	SE	1x1m	Jane Kenney	20/05/2024
G2534_345	Wall 4035 with 4012 to left	SE	1x1m	Jane Kenney	20/05/2024
G2534_346	Wall 4035 with 4031 in background	SE	1x1m	Jane Kenney	20/05/2024

Photo Record Number	Description	View from	Scale(s)	Taken by	Taken on
G2534_347	Wall 4035 with wall 4034 joining from the right	SE	1x1m	Jane Kenney	20/05/2024
G2534_348	North end of wall 4035	N	1x1m	Jane Kenney	20/05/2024
G2534_349	North end of wall 4035	N	1x1m	Jane Kenney	20/05/2024
G2534_350	South end of wall 4031	S	1x1m	Jane Kenney	20/05/2024
G2534_351	South end of wall 4031	E	1x1m	Jane Kenney	20/05/2024
G2534_352	South end of wall 4031	NE	1x1m	Jane Kenney	20/05/2024
G2534_353	West facing section through wall 4014 (Dwg 29)	W	1x1m	Jane Kenney	21/05/2024
G2534_354	West facing section through wall 4014 (Dwg 29)	W	1x1m	Jane Kenney	21/05/2024
G2534_355	Feature 4017 partly excavated showing charcoal layer 4040 and stones stepping in 4039	W	1x1m	Jane Kenney	22/05/2024
G2534_356	Feature 4017 partly excavated showing charcoal layer 4040 and stones stepping in 4039	S	1x1m	Jane Kenney	22/05/2024
G2534_357	North-northeast facing section across [4017]. Section dwg 30	NNE	1x1m	Jane Kenney	22/05/2024
G2534_358	North-northeast facing section across [4017]. Section dwg 30	NNE	1x1m	Jane Kenney	22/05/2024
G2534_359	Iron smelting feature fully excavated	SW	1x1m	Jane Kenney	28/05/2024
G2534_360	Iron smelting feature fully excavated	SW	1x1m	Jane Kenney	28/05/2024
G2534_361	Detail of channel and pit 3204	SW	1x1m	Jane Kenney	28/05/2024
G2534_362	Iron smelting feature fully excavated	N	1x1m	Jane Kenney	28/05/2024
G2534_363	Iron smelting feature fully excavated with stones surrounding it	N	1x1m	Jane Kenney	28/05/2024
G2534_364	Detail of 4041 in channel	SW	Not used	Jane Kenney	28/05/2024
G2534_365	Pit 3204 fully excavated with 4042 in base	WSW	Not used	Jane Kenney	28/05/2024
G2534_366	Detail of blocking structure 4041 in 4017	NW	Not used	Jane Kenney	28/05/2024
G2534_367	Entrance to structure 4008 with fallen stones removed	NW	1x1m	Jane Kenney	28/05/2024
G2534_368	Entrance to 4008	NW	1x1m	Jane Kenney	28/05/2024
G2534_369	Junction between wall 4033 and wall of structure 4008	NW	1x1m	Jane Kenney	28/05/2024
G2534_370	Junction between wall 4034 and wall of structure 4008	E	1x1m	Jane Kenney	28/05/2024

Photo Record Number	Description	View from	Scale(s)	Taken by	Taken on
G2534_371	Junction between wall 4034 and wall of structure 4008	ESE	1x1m	Jane Kenney	28/05/2024
G2534_372	Junction between wall 4034 and wall of structure 4008	SSE	1x1m	Jane Kenney	28/05/2024
G2534_373	View of structure 4008 and general site	ENE	1x1m	Jane Kenney	28/05/2024
G2534_374	Feature 4005 partially excavated	WNW	1x1m	Jane Kenney	28/05/2024
G2534_375	West-northwest facing section of feature 4005	WNW	1x1m	Jane Kenney	28/05/2024
G2534_2023_101	Oblique view of cell 12	N	1m	Bethan Jones	31/08/2023
G2534_2023_102	Cell 12: NW facing internal elevation	NW	1m	Bethan Jones	31/08/2023
G2534_2023_103	Cell 12: W facing internal elevation 1/2	W	1m	Bethan Jones	31/08/2023
G2534_2023_104	Cell 12: W facing internal elevation 2/2	W	1m	Bethan Jones	31/08/2023
G2534_2023_105	Cell 12: SE facing internal elevation	SE	1m	Bethan Jones	31/08/2023
G2534_2023_106	Cell 12: E facing internal elevation 1/2	E	1m	Bethan Jones	31/08/2023
G2534_2023_107	Cell 12: E facing internal elevation 2/2	E	1m	Bethan Jones	31/08/2023
G2534_2023_108	Cell 11: overview shot	SW	1m	Bethan Jones	31/08/2023
G2534_2023_109	Cell 11: SW facing internal elevation	SW	1m	Bethan Jones	31/08/2023
G2534_2023_110	Cell 11: NE facing internal elevation	NE	1m	Bethan Jones	31/08/2023
G2534_2023_111	Cell 11: NW facing internal elevation 1/2	NW	1m	Bethan Jones	31/08/2023
G2534_2023_112	Cell 11: NW facing internal elevation 2/2	NW	1m	Bethan Jones	31/08/2023
G2534_2023_113	Cell 11: SE facing internal elevation 1/2	SE	1m	Bethan Jones	31/08/2023
G2534_2023_114	Cell 11: SE facing internal elevation 2/2	SE	1m	Bethan Jones	31/08/2023
G2534_2023_115	Cell 10: overview shot	NE	1m	Bethan Jones	31/08/2023
G2534_2023_116	Cell 10: NW facing internal elevation	NW	1m	Bethan Jones	31/08/2023
G2534_2023_117	Cell 10: W facing internal elevation 1/2	W	1m	Bethan Jones	31/08/2023
G2534_2023_118	Cell 10: W facing internal elevation 2/2	W	1m	Bethan Jones	31/08/2023
G2534_2023_119	Cell 10: SW facing internal elevation	SW	1m	Bethan Jones	31/08/2023
G2534_2023_120	Cell 10: SE facing internal elevation 1/2	SE	1m	Bethan Jones	31/08/2023
G2534_2023_121	Cell 10: SE facing internal elevation 2/2	SE	1m	Bethan Jones	31/08/2023

Photo Record Number	Description	View from	Scale(s)	Taken by	Taken on
G2534_2023_122	Cell 9: overview shot	S	1m	Bethan Jones	31/08/2023
G2534_2023_123	Cell 9: N facing internal elevation	N	1m	Bethan Jones	31/08/2023
G2534_2023_124	Cell 9: W facing internal elevation 1/2	W	1m	Bethan Jones	31/08/2023
G2534_2023_125	Cell 9: W facing internal elevation 2/2	W	1m	Bethan Jones	31/08/2023
G2534_2023_126	Cell 9: S facing internal elevation	S	1m	Bethan Jones	31/08/2023
G2534_2023_127	Cell 9: E facing internal elevation	E	1m	Bethan Jones	31/08/2023
G2534_2023_128	Cell 8: overview shot	SE	1m	Bethan Jones	31/08/2023
G2534_2023_129	Cell 8: NW facing internal elevation	NW	1m	Bethan Jones	31/08/2023
G2534_2023_130	Cell 8: SW facing internal elevation 1/2	SW	1m	Bethan Jones	31/08/2023
G2534_2023_131	Cell 8: SW facing internal elevation 2/2	SW	1m	Bethan Jones	31/08/2023
G2534_2023_132	Cell 8: SE facing internal elevation	SE	1m	Bethan Jones	31/08/2023
G2534_2023_133	Cell 8: NE facing internal elevation 1/2	NE	1m	Bethan Jones	31/08/2023
G2534_2023_134	Cell 8: NE facing internal elevation 2/2	NE	1m	Bethan Jones	31/08/2023
G2534_2023_135	Cell 7: overview shot	SE	1m	Bethan Jones	31/08/2023
G2534_2023_136	Cell 7: NW facing internal elevation	NW	1m	Bethan Jones	31/08/2023
G2534_2023_137	Cell 7: SW facing internal elevation 1/2	SW	1m	Bethan Jones	31/08/2023
G2534_2023_138	Cell 7: SW facing internal elevation 2/2	SW	1m	Bethan Jones	31/08/2023
G2534_2023_139	Cell 7: SE facing internal elevation	SE	1m	Bethan Jones	31/08/2023
G2534_2023_140	Cell 7: NE facing internal elevation 1/2	NE	1m	Bethan Jones	31/08/2023
G2534_2023_141	Cell 7: NE facing internal elevation 2/2	NE	1m	Bethan Jones	31/08/2023
G2534_2023_142	Cell 13: overview shot	S	1m	Bethan Jones	31/08/2023
G2534_2023_143	Cell 13: SE facing internal elevation	SE	1m	Bethan Jones	31/08/2023
G2534_2023_144	Cell 13: NE facing internal elevation 1/2	NE	1m	Bethan Jones	31/08/2023
G2534_2023_145	Cell 13: NE facing internal elevation 2/2	NE	1m	Bethan Jones	31/08/2023
G2534_2023_146	Cell 13: NW facing internal elevation	NW	1m	Bethan Jones	31/08/2023
G2534_2023_147	Cell 13: SW facing internal elevation 1/2	SW	1m	Bethan Jones	31/08/2023

Photo Record Number	Description	View from	Scale(s)	Taken by	Taken on
G2534_2023_148	Cell 13: SW facing internal elevation 2/2	SW	1m	Bethan Jones	31/08/2023
G2534_2023_149	Cell 14: overview shot	S	1m	Bethan Jones	31/08/2023
G2534_2023_150	Cell 14: SE facing internal elevation	S	1m	Bethan Jones	31/08/2023
G2534_2023_151	Cell 14: NE facing internal elevation 1/2	NE	1m	Bethan Jones	31/08/2023
G2534_2023_152	Cell 14: NE facing internal elevation 2/2	NE	1m	Bethan Jones	31/08/2023
G2534_2023_153	Cell 14: NW facing internal elevation	NW	1m	Bethan Jones	31/08/2023
G2534_2023_154	Cell 14: SW facing internal elevation 1/2	SW	1m	Bethan Jones	31/08/2023
G2534_2023_155	Cell 14: SW facing internal elevation 2/2	SW	1m	Bethan Jones	31/08/2023
G2534_2023_156	Cell 15: overview shot	S	1m	Bethan Jones	31/08/2023
G2534_2023_157	Cell 15: SE facing internal elevation	S	1m	Bethan Jones	31/08/2023
G2534_2023_158	Cell 15: NE facing internal elevation 1/2	NE	1m	Bethan Jones	31/08/2023
G2534_2023_159	Cell 15: NE facing internal elevation 2/2	NE	1m	Bethan Jones	31/08/2023
G2534_2023_160	Cell 15: NW facing internal elevation	NW	1m	Bethan Jones	31/08/2023
G2534_2023_161	Cell 15: SW facing internal elevation 1/2	SW	1m	Bethan Jones	31/08/2023
G2534_2023_162	Cell 15: SW facing internal elevation 2/2	SW	1m	Bethan Jones	31/08/2023
G2534_2023_163	Cell 16: overview shot (cell 1 in background)	S	1m	Bethan Jones	31/08/2023
G2534_2023_164	Cell 16: SE facing internal elevation	SE	1m	Bethan Jones	31/08/2023
G2534_2023_165	Cell 16: NE facing internal elevation	NE	1m	Bethan Jones	31/08/2023
G2534_2023_166	Cell 16: NW facing internal elevation	NW	1m	Bethan Jones	31/08/2023
G2534_2023_167	Cell 16: SW facing internal elevation	SW	1m	Bethan Jones	31/08/2023
G2534_2023_168	Cell 1: overview shot	SW	1m	Bethan Jones	31/08/2023
G2534_2023_169	Cell 1: SW facing internal elevation	SW	1m	Bethan Jones	31/08/2023
G2534_2023_170	Cell 1: SE facing internal elevation	SE	1m	Bethan Jones	31/08/2023
G2534_2023_171	Cell 1: NE facing internal elevation	NE	1m	Bethan Jones	31/08/2023
G2534_2023_172	Cell 1: NW facing internal elevation	NW	1m	Bethan Jones	31/08/2023
G2534_2023_173	Cell 18: overview shot	SE		Bethan Jones	31/08/2023

Photo Record Number	Description	View from	Scale(s)	Taken by	Taken on
G2534_2023_174	Cell 18: SE facing internal elevation 1/2	SE	1m	Bethan Jones	31/08/2023
G2534_2023_175	Cell 18: SE facing internal elevation 2/2	SE	1m	Bethan Jones	31/08/2023
G2534_2023_176	Cell 18: NE facing internal elevation 1/2	NE	1m	Bethan Jones	31/08/2023
G2534_2023_177	Cell 18: NE facing internal elevation 2/2	NE	1m	Bethan Jones	31/08/2023
G2534_2023_178	Cell 18: NW facing internal elevation 1/2	NW	1m	Bethan Jones	31/08/2023
G2534_2023_179	Cell 18: NW facing internal elevation 2/2, possible shelter	NW	1m	Bethan Jones	31/08/2023
G2534_2023_180	Cell 18: SW facing internal elevation 1/2	SW	1m	Bethan Jones	31/08/2023
G2534_2023_181	Cell 18: SW facing internal elevation 2/2	SW	1m	Bethan Jones	31/08/2023
G2534_2023_182	Cell 11: SW facing external elevation	SW	1m	Bethan Jones	31/08/2023
G2534_2023_183	Cell 10: SW facing external elevation	SW	1m	Bethan Jones	31/08/2023
G2534_2023_184	Cell 10: S facing external elevation	S	1m	Bethan Jones	31/08/2023
G2534_2023_185	Cell 10: SE facing external elevation	SE	1m	Bethan Jones	31/08/2023
G2534_2023_186	Cell 9: SE facing external elevation	SE	1m	Bethan Jones	31/08/2023
G2534_2023_187	Cells 8 and 9: SE facing external elevation	SE	1m	Bethan Jones	31/08/2023
G2534_2023_188	Cell 8: SE facing external elevation	SE	1m	Bethan Jones	31/08/2023
G2534_2023_189	Cell 7: SE facing external elevation	SE	1m	Bethan Jones	31/08/2023
G2534_2023_190	Cell 7: SE facing external elevation	SE	1m	Bethan Jones	31/08/2023
G2534_2023_191	Cell 17: NE facing internal elevation 1/4	NE	1m	Bethan Jones	31/08/2023
G2534_2023_192	Cell 17: NE facing internal elevation 2/4	NE	1m	Bethan Jones	31/08/2023
G2534_2023_193	Cell 17: NE facing internal elevation 3/4	NE	1m	Bethan Jones	31/08/2023
G2534_2023_194	Cell 17: NE facing internal elevation 4/4	NE	1m	Bethan Jones	31/08/2023
G2534_2023_195	Possible shelter in E corner of cell 18	SE	1m	Bethan Jones	31/08/2023
G2534_2023_196	Possible shelter in E corner of cell 18	SW	1m	Bethan Jones	31/08/2023
G2534_2023_197	Cell 6: SW facing external elevation 1/4	SW	1m	Bethan Jones	31/08/2023
G2534_2023_198	Cell 6: SW facing external elevation 2/4	SW	1m	Bethan Jones	31/08/2023
G2534_2023_199	Cell 6: SW facing external elevation 3/4	SW	1m	Bethan Jones	31/08/2023

Photo Record Number	Description	View from	Scale(s)	Taken by	Taken on
G2534_2023_200	Cell 6: SW facing external elevation 4/4	SW	1m	Bethan Jones	31/08/2023
G2534_2023_201	Cell 6: SE facing external elevation 1/2	SE	1m	Bethan Jones	31/08/2023
G2534_2023_202	Cell 6: SE facing external elevation 2/2	SE	1m	Bethan Jones	31/08/2023
G2534_2023_203	Cell 6: E facing external elevation 1/3	E	1m	Bethan Jones	31/08/2023
G2534_2023_204	Cell 6: E facing external elevation 2/3	E	1m	Bethan Jones	31/08/2023
G2534_2023_205	Cell 6: E facing external elevation 3/3	E	1m	Bethan Jones	31/08/2023
G2534_2023_206	Cell 5: E facing external elevation	E	1m	Bethan Jones	31/08/2023
G2534_2023_207	Cells 4 and 5: NE facing external elevation	NE	1m	Bethan Jones	31/08/2023
G2534_2023_208	Cell 4: NE facing external elevation	NE	1m	Bethan Jones	31/08/2023
G2534_2023_209	Cell 3: NE facing external elevation	NE	1m	Bethan Jones	31/08/2023
G2534_2023_210	Cell 2: SE facing external elevation	SE	1m	Bethan Jones	31/08/2023
G2534_2023_211	Cell 2: NE facing external elevation	NE	1m	Bethan Jones	31/08/2023
G2534_2023_212	Cell 2: NW facing external elevation	NW	1m	Bethan Jones	31/08/2023
G2534_2023_213	Cell 1: NE facing external elevation	NE	1m	Bethan Jones	31/08/2023
G2534_2023_214	Cell 1: NW facing external elevation	NW	1m	Bethan Jones	31/08/2023
G2534_2023_215	Cell 16: NW facing external elevation	NW	1m	Bethan Jones	31/08/2023
G2534_2023_216	Cell 15: NE facing external elevation	NE	1m	Bethan Jones	31/08/2023
G2534_2023_217	Cell 15: NW facing external elevation	NW	1m	Bethan Jones	31/08/2023
G2534_2023_218	Cell 14: NW facing external elevation	NW	1m	Bethan Jones	31/08/2023
G2534_2023_219	Cell 13: NW facing external elevation	NW	1m	Bethan Jones	31/08/2023
G2534_2023_220	Cell 13: SW facing external elevation	SW	1m	Bethan Jones	31/08/2023
G2534_2023_221	Cell 12: NW facing external elevation	NW	1m	Bethan Jones	31/08/2023
G2534_2023_222	Cell 12: SW facing external elevation and end of denuded wall	SW	1m	Bethan Jones	31/08/2023
G2534_2023_223	Cell 11: oblique view of NW external elevation	SW	1m	Bethan Jones	31/08/2023
G2534_2023_224	Cell 12: oblique view of SE external elevation	S	1m	Bethan Jones	31/08/2023
G2534_2023_225	View into interior down entranceway	SW	1m	Bethan Jones	31/08/2023

Photo Record Number	Description	View from	Scale(s)	Taken by	Taken on
G2534_2023_226	View of denuded wall next to cell 12	SE	1m	Bethan Jones	31/08/2023
G2534_2023_227	Cell 17: view into interior	SE	1m	Bethan Jones	31/08/2023
G2534_2023_1001	Cell 6: overview	S	1m	Neil McGuiness	31/08/2023
G2534_2023_1002	Cell 6: NW facing interior elevation	NW	1m	Neil McGuiness	31/08/2023
G2534_2023_1003	Cell 6: W facing interior elevation 1/2	W	1m	Neil McGuiness	31/08/2023
G2534_2023_1004	Cell 6: W facing interior elevation 2/2	W	1m	Neil McGuiness	31/08/2023
G2534_2023_1005	Cell 6: S facing interior elevation	S	1m	Neil McGuiness	31/08/2023
G2534_2023_1006	Cell 6: E facing interior elevation	E	1m	Neil McGuiness	31/08/2023
G2534_2023_1007	Cell 6: NE facing interior elevation 1/2	NE	1m	Neil McGuiness	31/08/2023
G2534_2023_1008	Cell 6: NE facing interior elevation 2/2	NE	1m	Neil McGuiness	31/08/2023
G2534_2023_1009	Cell 5: overview	NE	1m	Neil McGuiness	31/08/2023
G2534_2023_1010	Cell 5: SW facing interior elevation	SW	1m	Neil McGuiness	31/08/2023
G2534_2023_1011	Cell 5: SE facing interior elevation 1/2	SE	1m	Neil McGuiness	31/08/2023
G2534_2023_1012	Cell 5: SE facing interior elevation 2/2	SE	1m	Neil McGuiness	31/08/2023
G2534_2023_1013	Cell 5: NE facing interior elevation	NE	1m	Neil McGuiness	31/08/2023
G2534_2023_1014	Cell 5: NW facing interior elevation 1/2	NW	1m	Neil McGuiness	31/08/2023
G2534_2023_1015	Cell 5: NW facing interior elevation 2/2	NW	1m	Neil McGuiness	31/08/2023
G2534_2023_1016	Cell 4: overview	SW	1m	Neil McGuiness	31/08/2023
G2534_2023_1017	Cell 4: SW facing interior elevation	SW	1m	Neil McGuiness	31/08/2023
G2534_2023_1018	Cell 4: SE facing interior elevation 1/2	SE	1m	Neil McGuiness	31/08/2023
G2534_2023_1019	Cell 4: SE facing interior elevation 2/2	SE	1m	Neil McGuiness	31/08/2023
G2534_2023_1020	Cell 4: NE facing interior elevation	NE	1m	Neil McGuiness	31/08/2023
G2534_2023_1021	Cell 4: NW facing interior elevation 1/2	NW	1m	Neil McGuiness	31/08/2023
G2534_2023_1022	Cell 4: NW facing interior elevation 2/2	NW	1m	Neil McGuiness	31/08/2023
G2534_2023_1023	Cell 3: overview	S	1m	Neil McGuiness	31/08/2023
G2534_2023_1024	Cell 3: SW facing interior elevation	SW	1m	Neil McGuiness	31/08/2023

Photo Record Number	Description	View from	Scale(s)	Taken by	Taken on
G2534_2023_1025	Cell 3: SE facing interior elevation 1/2	SE	1m	Neil McGuiness	31/08/2023
G2534_2023_1026	Cell 3: SE facing interior elevation 2/2	SE	1m	Neil McGuiness	31/08/2023
G2534_2023_1027	Cell 3: NE facing interior elevation	NE	1m	Neil McGuiness	31/08/2023
G2534_2023_1028	Cell 3: NW facing interior elevation 1/2	NW	1m	Neil McGuiness	31/08/2023
G2534_2023_1029	Cell 3: NW facing interior elevation 2/2	NW	1m	Neil McGuiness	31/08/2023
G2534_2023_1030	Cell 2: overview	SSW	1m	Neil McGuiness	31/08/2023
G2534_2023_1031	Cell 2: SW facing interior elevation	SW	1m	Neil McGuiness	31/08/2023
G2534_2023_1032	Cell 2: SE facing interior elevation 1/2	SE	1m	Neil McGuiness	31/08/2023
G2534_2023_1033	Cell 2: SE facing interior elevation 2/2	SE	1m	Neil McGuiness	31/08/2023
G2534_2023_1034	Cell 2: NE facing interior elevation	NE	1m	Neil McGuiness	31/08/2023
G2534_2023_1035	Cell 2: NW facing interior elevation 1/3	NW	1m	Neil McGuiness	31/08/2023
G2534_2023_1036	Cell 2: NW facing interior elevation 2/3	NW	1m	Neil McGuiness	31/08/2023
G2534_2023_1037	Cell 2: NW facing interior elevation 3/3	NW	1m	Neil McGuiness	31/08/2023

APPENDIX IV

Written Scheme of Investigation

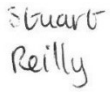
QUARRY REALIGNMENT PROJECT, PENRHYN QUARRY, BETHESDA, GWYNEDD(G2534)

WRITTEN SCHEME OF INVESTIGATION FOR ARCHAEOLOGICAL MITIGATION

Prepared for Breedon Group/Welsh Slate Limited

June 2023

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

Approvals Table				
	Role	**Printed Name**	**Signature**	**Date**
Originated by	Document Author	Stuart Reilly		15/06/2023
Reviewed by	Document Reviewer	John Roberts		
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

QUARRY REALIGNMENT PROJECT, PENRHYN QUARRY, BETHESDA, GWYNEDD (G2534)

WRITTEN SCHEME OF INVESTIGATION FOR ARCHAEOLOGICAL MITIGATION

Prepared for *Breedon Group/Welsh Slate Limited*, June 2023

CONTENTS

1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) has been contracted by The Breedon Group/Welsh Slate Limited to prepare a written scheme of investigation (WSI) for archaeological mitigation in advance of quarry realignment at Penrhyn Quarry, Bethesda. The realignment comprises a *c*.6.4ha extension to the existing Penrhyn Quarry incorporating an area of upland to the southwest of the current workings (centred on NGR SH61146396; Figure 01).

The archaeological mitigation was preceded by a series of evaluation trial pits and test trenches excavated by GAT (Report 1423, Reilly, 2018), interspersed by a geophysical survey conducted by Tigergeo:

- Stage 1 of the evaluation was conducted by GAT in August and September 2017. It consisted of the hand excavation of six 5m x 0.80m test trenches and 30 0.3m x 0.3m test pits;

- A magnetometer survey was undertaken by Tigergeo in October 2017 to locate possible iron production activity identified during the Stage 1 evaluation and buried features of archaeological interest; and

- Stage 2 of the evaluation was conducted by GAT in February 2018. It was comprised of the hand excavation of four 3m x 0.80m test trenches and five 0.50m x 0.50m test pits, that targeted potential archaeological features identified in the magnetometer survey (Figure 02).

The archaeological mitigation will comprise of 3 actions:

1. Record the post-medieval multicellular sheepfold (PRN 29,989) and the various paddocks/enclosures and possible roundhouses that comprise the late prehistoric settlement (PRN 5380).

2. Targeted excavation that will incorporate Feature Number 5, the small, oval shaped paddock, the associated, possible house structures and the eastern end of the adjacent paddock/enclosure Feature Number 4.

3. Further to the completion of the monument record and targeted excavation an archaeological watching brief will be conducted during the soil strip of the quarry extension.

This WSI outlines the methodology for the monument record and targeted excavation alone; the watching brief will have a **separate WSI**.

The archaeological mitigation is anticipated to be undertaken in the summer of 2023 in accordance with 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 the archaeological investigation and recording of standing buildings or structures (Chartered Institute for Archaeologists, 2020);
- Standard and Guidance for Archaeological Field Strip/Map/Record (Chartered Institute for Archaeologists, 2020a);
- Standard and guidance for the collection, documentation, conservation and research of archaeological materials (Chartered Institute for Archaeologists, 2020b); and
- Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives (Chartered Institute for Archaeologists, 2020b).

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 and Objectives

The key aims and objectives are to:

- fully record the upstanding remains of the late prehistoric settlement (PRN 5380) and multicellular sheepfold (PRN 29,989);
- locate the source of the iron slag uncovered in test pit 18 and determine if a furnace is present within this part of the settlement;
- to expose and characterise all archaeological activity within the area of excavation;
- establish the date and nature of any archaeological remains identified within the targeted area of excavation and assess their implications for understanding the development of the site, in conjunction with the known archaeological record; and
- place the results in context, reference shall be made to *A Research Framework for the Archaeology of Wales Version 03, Final Refresh Document* (March 2017).

1.2 Monitoring Arrangements

The Archaeological Mitigation 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. The GAPS Planning Archaeologist will be kept informed of the project timetable and of the subsequent progress and findings. This will allow time to arrange monitoring visits and attend site meetings (if required) and enable discussion about the need or otherwise for further works (if required) as features of potential archaeological significance are encountered.

1.3 Historic Environment Record

In line with the GAT 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, 2022). In line with this guidance, all submitted reporting will need to include the equivalent of a non-technical summary in Welsh and English at the front of the report combined with short bilingual summaries of the principal Historic Assets recorded during the event. These requirements are mandatory. The GAT HER enquiry number is **GATHER1879**, and the event primary reference number is **46653**.

The GAT HER will also be responsible for supplying Primary Reference Numbers (PRN) for new assets identified and recorded.

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

2.1 Introduction

Penrhyn Quarry lies within the Dyffryn Ogwen Landscape of Outstanding Historic Interest: 28 (CCW, Cadw, ICOMOS 1998) and forms one of the most important elements of this landscape. Penrhyn Quarry was formalised during the 18th century when Richard Pennant acquired a number of small local workings but slate is thought to have been extracted in this area as early as the 13th century. Infrastructure including railways, quarrymen's cottages and a quay at Porth Penrhyn were constructed at the end of the 18th and start of the 19th centuries. The quarry dominated both the slate industry and the surrounding landscape throughout the 19th century. Today the quarry continues to be run as a commercial venture and markets a variety of slate products.

As well as the extensive industrial archaeological remains that exist within the locality, mainly associated with the extraction of slate, the uplands around Bethesda and Nant Ffrancon contain extensive and very well-preserved relict remains of prehistoric and later land use.

An archaeological assessment of the proposed realignment zone was undertaken by GAT in November 2009 (GAT report 837). The assessment identified a number of sites, the majority relating to a late prehistoric settlement (PRN 5380) and a post-medieval multi-cellular sheepfold (PRN 29,989). In order to better identify the significance of the archaeological remains and identify appropriate mitigation an archaeological survey and a phase of field evaluation was undertaken (GAT reports 880 and 899) in July and September 2010 respectively (Figure 03).

The programme of field evaluation examined four sites identified during the desk based assessment and archaeological survey. These included a cleared terraced area (Feature 20), a suspected prehistoric structure (Feature 16), a possible burial cairn (Feature 15), and a possible ruined hut circle with sheepfold rebuild (Feature 14). The results of the evaluation proved the suspected prehistoric structure as being of natural origin. Furthermore, it showed that there was no evidence that the sheepfold utilised an earlier hut circle and nor that there were any associated buried remains present on the cleared terrace area. It did however show that a relatively complex level of archaeology was revealed at the possible burial cairn site (Feature 15), and the evaluation indicated the presence of archaeological remains and archaeological excavation of the entire feature was recommended as appropriate mitigation prior to the extension works.

The excavation was completed in December 2012 (GAT report 1105), and revealed a roughly rectangular stone structure, measuring approximately 7m by 5m, and aligned east west. The date and function of this structure was uncertain. However, given its shape and size, it was most likely the remains of a post-medieval peat and/ or hay drying platform. The report recommended an archaeological watching brief as appropriate mitigation during the extension works.

Two watching briefs were completed in areas to the northeast and southeast of Feature 12 in 2013 (GAT report 1131) and 2014 (GAT report 1266) respectively. The watching briefs confirmed that the natural topography of the site was fairly close to the surface, lying on average only 0.2m below ground level and consisting of a light orange sandy clay. A large number of natural sub-angular stones and boulders were located throughout the site, with only a few small patches being relatively stone free. No archaeological features or deposits were uncovered during either of the watching briefs.

A programme of detailed recording and targeted trenching was complete across Feature 12 in 2015 (GAT report 1238). Feature 12 (trackway) was surveyed and photographed prior to the excavation of a trial trench towards its southern end. No evidence of any surface was uncovered, and it is likely that the trackway was created by the removal of stones along its length, and that the depth was due to the general use of the trackway. No finds were uncovered during the excavation, and therefore a date for the trackway is uncertain. However, given the close proximity to the possible medieval Hafod (Feature 13) it is likely to be of a comparable date. Two further features (Feature 10 and 17) were fenced off so as to be avoided during the realignment works.

2.2 Recent Evaluation Work

The most recent archaeological activity conducted on site has been the phased archaeological evaluation of the site conducted by GAT in September 2017 and February 2018 and by a magnetometer survey conducted of the site by Tigergeo during October 2017.

Stage 1 of the evaluation confirmed the presence of drystone walls in Trenches 1 to 5 that uniformly consisted of locally sourced stones, most likely from field clearance, which were built on top of and between earthfast boulders to form rather sinuous, wandering boundaries that loosely defined paddocks/enclosures. There was no evidence for foundation cuts or any sealed horizons and in the majority of cases the basal stones were set directly on top of earthfast boulders and/or the underlying natural clay. The one exception to this was wall [604] which was built on top of the subsoil layer (602). No artefacts or ecofacts were retrieved from the trenches that could be used to aid the dating of these drystone walls.

Indeed, aside from the walls, there were no archaeological features or deposits found within the trenches. The majority of the test pits hand excavated in the settlement also did not produce archaeological material, the exception being test pit 18, where a small quantity of iron smelting slag was recovered.

The subsequent magnetometer survey undertaken by Tigergeo identified a series of potential archaeological features, some of which, such as Features 7 and 8, were associated with the iron slag retrieved from test pit 18. The trenches and test pits hand excavated at the location of these potential archaeological features revealed that the possible linear or structural features were actually geological in nature, typically being seams or concentrations of earthfast boulders. Test pit 31 was located immediately adjacent to test pit 18 but did not produce additional iron slag or material associated with it. Test pit 32 within the nearby circular structure identified a probable cut with a fill that included charcoal and slag and the underlying natural clay had been oxidised. Given the nature of the fill and the oxidised natural it is highly likely that this was an area of iron smelting set within a rough shelter or a smithy.

The *Research Framework for the Archaeology of Wales* was consulted to help to provide context for the late prehistoric activity identified on the site during the phased evaluation. The current iteration of the research agenda does not include an update for Late Bronze Age and Iron Age Wales (1500 BC to 43 AD) but key areas were identified in earlier stages. In previous iterations it was determined that the following points should be focused on for research: "*Building Chronologies was key, settlement evidence, Palaeobotanical evidence, Social change and social processes, climate change and the impact on resource utilisation were identified as important*." (A Research Framework for the Archaeology of Wales 2016, Late Bronze Age and Iron Age Wales, 2).

Based on what was outlined by the Research Framework and the need to better understand the site in advance of the client submitting planning application for a proposed quarry realignment, the sample retrieved from (3202) was sent to AOC for specialist assessment. While this determined that the slag was the result of ironworking from a bloomery furnace, it was most likely a dump of material similar to that identified in test pit 18, rather than the location of said furnace. Given the nature of the material it was not possible to provide a concise date for it based on examination of the morphology alone. In addition, the limited charcoal recovered from the sample belonged to oak (*Quercus* sp), which is not viable for radiocarbon dating. As such, while the specialist assessment has provided more information about the type of iron smelting that took place on site, on this occasion it cannot produce a concise date for this activity and by association the settlement.

3 METHODOLOGY

3.1 Introduction

The archaeological mitigation will be conducted in an area to the immediate southwest of the existing Penrhyn Quarry works. The area in question is situated on the southern side of Gwaen Gynfi, a large expanse of mostly unenclosed peat bog to the south of Mynydd Llandegai. The land rises from 275m OD at the north to around 400m at the south. The bog drains into the Afon Marchlyn Mawr which in turn runs into the Galedffrwd, a tributary of the Ogwen. The borders of the bog adjoining the quarry are better drained and consist of natural terraces and boulder fields.

The archaeological mitigation will consist of the following actions:

1. Record the post-medieval multicellular sheepfold (PRN 29,989) and the various paddocks/enclosures and possible roundhouses that comprise the late prehistoric settlement (PRN 5380).

2. Targeted excavation that will incorporate Feature Number 5, the small, oval shaped paddock, the associated, possible house structures and the eastern end of the adjacent paddock/enclosure Feature Number 4.

3. Further to the completion of the monument record and targeted excavation an archaeological watching brief will be conducted during the soil strip of the quarry extension. **The watching brief will be outlined in a separate WSI**.

3.2 Record of Upstanding Remains

The archaeological mitigation will include recording the post-medieval multicellular sheepfold (PRN 29,989) and the various paddocks/enclosures and possible roundhouses that comprise the late prehistoric settlement (PRN 5380). Recording the upstanding remains of the sheepfold and of the late prehistoric settlement will be undertaken using a combination of Trimble R8 GNSS/R6/5800 GPS receiver (<10cm accuracy) and DJI Phantom 4 Pro Plus v2.0 Quadcopter.

To record the remnants of wandering drystone walls that define the enclosures, paddocks and probable hut circles that comprise PRN 5380 numerous overlapping photographs will be taken using a DJI Phantom 4 Pro Plus v2.0 Quadcopter. Targets will be laid out and surveyed in with the Trimble R8 GNSS/R6/5800 GPS receiver and will be included in the photographs. The photographs will then be processed using the Agisoft Metashape photogrammetry program to create 3D models, which will be georectified using the surveyed targets. From this data orthomosaics will be produced, which are perfectly horizontal images exactly to scale and georectified. As a minimum, a detailed landscape survey will be produced from the survey to complement the existing plans of the site. Given the relatively low height of the surviving walls and lack of definitive faces to the walls, it may not be viable to 3D models of these structures. This will be reviewed in the field and the client and GAPS will be advised accordingly.

To record the multicellular sheepfold (PRN 29,989) targets will be placed within and immediately around the monument which will be surveyed in with the Trimble R8 GNSS/R6/5800 GPS receiver. The DJI Phantom 4 Pro Plus v2.0 Quadcopter will be deployed to take numerous overlapping photographs which will include the survey targets. Where it is not viable to extract sufficient information using the drone, for example, within the smaller cells of the sheepfold, photographs will be taken with a Nikon DSLR (with a minimum of 16.2 megapixels and maximum resolution of 4928 x 3264) handheld and/or on a camera pole. The photographs will then be processed using the Agisoft Metashape photogrammetry program to create 3D models, which will be georectified using the surveyed targets. From this data orthomosaics will be produced, which are perfectly horizontal images exactly to scale and georectified.

3.3 Targeted Excavation

The targeted excavation that will incorporate Feature Number 5, the small, oval shaped paddock, the associated, possible house structures and the eastern end of the adjacent paddock/enclosure Feature Number 4 of the late prehistoric settlement (PRN 5380). During the archaeological evaluation, test pit 18 which was located to the immediate north of (within 1.5m of the outer wall) Feature 7, a suspected prehistoric structure, in Feature 5 a probable paddock, produced a small quantity of bloomery iron smelting slag.

The aims of the excavation are:

- Locate the source of the iron slag and determine if a furnace is present within this part of the settlement.
- To expose and characterise all archaeological activity within the area of excavation.
- Establish the date and nature of any archaeological remains identified within the targeted area of excavation and assess their implications for understanding the development of the site, in conjunction with the known archaeological record.
- Place the results in context, reference shall be made to *A Research Framework for the Archaeology of Wales Version 03, Final Refresh Document* (March 2017).

The works are anticipated to take place in July and August 2023.

All fieldwork will be completed in accordance with industry standards and the GAT Fieldwork Manual and the following methodology will apply:

- The targeted excavation will be soil stripped by machinery fitted with a toothless bucket as far as the glacial horizon or an archaeological horizon, whichever is encountered first;
- All attendances, subsurface activity, photographs and contexts records will be recorded using GAT pro-formas (cf. Appendix I and II). The records will include topsoil and subsoil depths, as well as the composition of the glacial horizon. All encountered subsurface features will be recorded on GAT pro-formas with detailed notations and will be recorded photographically with an appropriate scale, located via GPS and a measured survey completed, either hand drawn or using a Trimble R8 GPS unit.
- Photographic images will be taken using a digital SLR camera set to maximum resolution in RAW format; the photographic record will be digitised in *Excel* as part of the fieldwork

archive and dissemination process. Photographic images will be archived in TIFF format using Adobe Photoshop; the archive numbering system will start from **G2534_213**. A photographic ID board will be used during the Strip/Map/Record to record site code, image orientation and any relevant context numbers.

- Any archaeological features/deposits/structures encountered will be manually cleaned and examined to determine extent, function, date and relationship to adjacent activity. The following excavation strategy will generally apply: 50% sample of each sub-circular feature, 10% sample of each linear feature (terminal ends and intersection points with other features will be prioritised). However, if features prove to be of high archaeological significance they will be 100% excavated or an appropriate approach, such as excavating opposing quadrants of large spreads, will be agreed with GAPS and the client;
- Any required plans or sections to be drawn at a minimum 1:10 scale using GAT A4, A3 or A2 pro-forma permatrace.

Should dateable artefacts, human remains and/or ecofacts be recovered, an **interim fieldwork report** will be submitted summarising the results of the mitigation, along with recommendations for a post-excavation assessment and analysis (in line with the MAP2 process). *Additional time, resourcing and costs will be required to undertake any post-excavation programme of works.*

3.4 Human Remains

If any human remains are identified that cannot be preserved *in situ*, any excavation will take place under appropriate regulations and with due regard for health and safety issues. In order to excavate human remains, a Ministry of Justice licence is required under Section *25* of the Burials Act 1857 for the removal of any body or remains of any body from any place of burial. In accordance with the Ministry of Justice licence, recovered remains will be reburied once the investigation and/or assessment/analysis are complete.

Non-fragmented skeletal remains will be excavated using wooden tools and collected and stored in polyethylene bags (with appropriate references for context, grave number, et al) and placed in a lidded cardboard archive box (note: separate boxes for each grave) and stored in a suitable manner within GAT premises. If significant quantities of human remains are encountered, a human osteologist should be contacted and appointed to advise the team during the fieldwork. The osteologist will be an external appointment: Dr. Genevieve Tellier | Tel: 01286 238827 | email: northwalesosteology@outlook.com who will assist in devising the excavation, recording and sampling strategy for features containing human remains. The osteologist should also help to ensure that adequate post-excavation processing of human remains is carried out so that the material is in a fit state for assessment during the post-excavation stage. For inhumations, this will involve washing, drying, marking and packing.

If human remains are recovered that are deemed suitable for further assessment/analysis, this will be completed in accordance with the osteologist's requirements and with *Human Bones from Archaeological Sites Guidelines for producing assessment documents and analytical reports* (Chartered Institute for Archaeologists, 2017).

3.5 Ecofacts

Should any archaeological features and/or sealed deposits be identified that are deemed suitable for assessment and analysis for ecofacts, bulk soil samples will be taken of not less than 40 litres for bulk samples, or 100% if the feature is smaller. Samples will be taken by GAT staff using 10 litre sampling buckets. Following the excavation the bulk samples will be processed by the GAT Project Archaeologist team using flotation and wet sieving. The samples will then be assessed and analysed for plant species and charcoal, with the results used to inform agrarian practices and wood fuel use, as well as possibly dating. The assessment and analysis, including species identification, will be completed by an ecofact specialist (e.g. Jackeline Robertson | AOC Archaeology | telephone: 0208 843 7380). Any deposits deemed suitable for dating will be submitted to a laboratory specialising in radiocarbon dating (e.g., SUERC).

Bulk soil samples will also be taken to recover small artefacts such as flint debitage or metal-working debris if these are suspected.

Where peat deposits or other organic deposits are encountered other sampling will be considered such as soil monoliths, bulk soil sampling for uncharred plant remains and for insect remains, and pollen coring will be considered, with specialists brought in to carry out sampling and subsequent analysis where appropriate. Buried soil horizons will also be considered for sampling for soil micromorphological analysis.

Any ecofact assessment/analysis proposals will require additional resourcing and cost and will only be undertaken further to agreement with GAPS and the client.

3.6 Artefacts

All archaeologically significant artefacts will be retained for further examination and identification. Pottery sherds and other objects of 19th and 20th century date will be examined on site and the context from which they were retrieved noted. Isolated sherds of this date or sherds from the ploughsoil will not be retained, but where deposits are directly related to 19th century activity they will be retained for study. Any artefacts recovered will be treated according to guidelines issued by the UK Institute of Conservation (Watkinson and Neal 2001) in particular the advice provided within *First Aid for Finds* (Rescue 1999) and Historic England.

Any waterlogged artefacts (e.g. wood or leather) that are to be recovered for post-excavation assessment and analysis will be processed in accordance with *Environmental Archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation* (English Heritage, 2011) and specifically in accordance with Brunning and Watson (2010) for waterlogged wood and Historic England (2012) for waterlogged leather. In such cases an external specialist will be contacted to agree an appropriate sampling and recovery strategy via Lucy Whittingham | Project Manager (post-excavation) | AOC Archaeology | telephone: 0208 843 7380 | email: lucy.whittingham@aocarchaeology.com).

Any specialist assessment/analysis proposals will require additional resourcing and cost and will only be undertaken further to agreement with GAPS and the client.

All finds are the property of the landowner; however, it is Trust policy to recommend that all finds are donated to an appropriate museum (in this case Storiel, Ffordd Gwynedd Bangor, Gwynedd, LL57 1DT), where they can be securely stored for potential future study. Access to finds must be granted to the Trust for a reasonable period to allow for analysis and for study and publication as necessary. Trust staff will undertake initial identification, but artefacts will be assessed and analysed by appropriate specialists in the post-excavation phase of the project, using a wide range of consultants used by the Trust, including National Museums and Galleries of Wales at Cardiff.

All finds of treasure must be reported to the coroner for the district within fourteen days of discovery or identification of the items. Items declared Treasure Trove become the property of the Crown, on whose behalf the Portable Antiquities Scheme acts as advisor on technical matters and may be the recipient body for the objects.

The Treasure Valuation Committee, based at the British Museum, and informed by the Portable Antiquities Scheme, will decide whether they or any other museum may wish to acquire the object. If no museum wishes to acquire the object, then the Secretary of State will be able to disclaim it. When this happens, the coroner will notify the occupier and landowner that he intends to return the object to the finder after 28 days unless he receives no objection. If the coroner receives an objection, the find will be retained until the dispute has been settled.

GAT will contact the landowner (via client) for agreement regarding the transfer of artefacts, initially to GAT and subsequently to the relevant museum (Storiel). A GAT produced pro-forma will be issued to the landowner where they are given the option to donate the finds or to record that they want them returning to them once analysis and assessment has been completed. Artefacts will be transferred to the Storiel in accordance with their guidelines.

3.7 Working Project Archive

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 Excel* and cross-referenced with all pro-formas;
3. Survey data: downloaded using a Computer Aided Design package;
4. Sections (if relevant): all cross referenced and complete;
5. Plans (if relevant): all cross referenced and complete;
6. Artefacts (if relevant): quantified and identified; register completed;
7. Ecofacts (if relevant): quantified and register completed;
8. Context register (if relevant): quantified and register completed.

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

The site archive data will then be processed, final illustrations will be compiled and a report will be produced which will detail and synthesise the results.

3.8 Data Management Plan

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 Selection Strategy document appended to the final report.

The aim is for a draft report to be submitted within one month of fieldwork completion, though this may take longer if extensive and complex archaeology is discovered. 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. Non-technical summary (Welsh and English)
2. Introduction
3. Background
4. Methodology
5. Results
6. Conclusion
7. List of sources consulted.
8. Appendix I – approved GAT project specification
9. Appendix II – photographic metadata
10. Appendix III – context register
11. Appendix IV – drawing register (if relevant)
12. Appendix V – artefact register (if relevant)
13. Appendix VI – ecofact register (if relevant)
14. Appendix VII – GAT selection strategy

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:
    - Photographic metadata (Excel);
    - Photographic archive (TIFF format);
    - Project Information form (Excel);
    - File Information form (Excel) – Microsoft Word report text final;
    - File Information form (Excel) – Photographic metadata (general);
    - File Information form (Excel) – Adobe PDF report final; and
    - File Information form (Excel) - Photographic metadata (detail).

3.9 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 is summarised in Appendix III and will be finalised 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.
- Regional & 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 with attendances on-site undertaken by a GAT Project Archaeologist(s). The Project Archaeologist will be responsible for following:

- All archaeological mitigation duties on site;
- Client/sub-contractor liaison;
- GAPS liaison, with regular updates;
- specialist liaison (if relevant);
- completing all on site pro-formas and the fieldwork archive itemised above, including the digital project register;
- sourcing Primary Reference Numbers (PRN) from the GAT HER for any new features identified;
- completing an event summary and creating or updating PRN data, dependent on results; and
- for submitting a draft final report (or interim report) for project manager review and approval, to then be submitted as per the arrangements defined above.

5 HEALTH AND SAFETY

The GAT Project Archaeologist(s) will be CSCS certified. Copies of the site-specific risk assessment will be supplied to the client and sub-contractor prior to the start of fieldwork. Any risks and hazards will be indicated prior to the start of work via a submitted risk assessment. All GAT staff will be issued with required personal safety equipment, including high visibility jacket, steel toe-capped boots and hard hat. All GAT fieldwork is undertaken in accordance with the Trust's Health and Safety Manual, Policy and Handbook which were prepared by WorkNest. All work will be undertaken in accordance with the client and site contractors Health and Safety requirements.

6 SOCIAL MEDIA

One of the key aims in the GAT mission statement is to improve the understanding, conservation and promotion of the historic environment in our area and inform and educate the wider public. To help achieve this, GAT maintains an active social media presence and seeks all opportunities to promote our projects and results. With permission, GAT would like the opportunity to promote our work on this scheme through our social media platforms. This could include social media postings during our attendance on site as well as any postings to highlight results. In all instances, approval will be sought from client prior to any postings.

7 INSURANCE

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 2024

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 2024

Professional Indemnity

Limit of Indemnity- £5,000,000 in respect of each and every claim

INSURER Hiscox Insurance Company Limited

POLICY TYPE Professional Indemnity

POLICY NUMBER PL-PSC10002389775/00

EXPIRY DATE 22/07/2024

8 SOURCES CONSULTED

Brunning, R and Watson, J 2010, *Waterlogged Wood: Guidelines on the Recording, Sampling, Conservation and Curation of Waterlogged Wood* (3rd edition).

Chartered Institute for Archaeologists, 2020, *Standard and Guidance for Archaeological Excavation.*

Chartered Institute for Archaeologists, 2020, *Standard and guidance for the collection, documentation, conservation and research of archaeological materials.*

Chartered Institute for Archaeologists, 2020, *Standard and guidance for the archaeological investigation and recording of standing buildings or structures*.

English Heritage, 1991, *Management of Archaeological Projects (MAP2).*

Gwynedd Archaeological Trust 2009 *Proposed Quarry Realignment, Penrhyn Quarry, Bethesda: Archaeological Assessment,* GAT unpublished report #837

Gwynedd Archaeological Trust 2010a *Proposed Quarry Realignment, Penrhyn Quarry, Bethesda: Archaeological Survey,* GAT unpublished report #880.

Gwynedd Archaeological Trust 2010b *Proposed Quarry Realignment, Penrhyn Quarry, Bethesda: Archaeological Evaluation,* GAT unpublished report #899.

Gwynedd Archaeological Trust 2012 *Proposed Quarry Realignment, Penrhyn Quarry, Bethesda: Excavation of suspected Bronze Age Cairn (Feature 15),* GAT unpublished report #1105.

Gwynedd Archaeological Trust 2013 *Proposed Quarry Realignment Project, Penrhyn Quarry, Bethesda Archaeological Watching Brief: Phase 1A - Interim Report.*

Gwynedd Archaeological Trust 2014 *Proposed Quarry Realignment Project, Penrhyn Quarry, Bethesda Archaeological Watching Brief Interim Report #1266.*

Gwynedd Archaeological Trust 2015 *Proposed Quarry Realignment Project, Penrhyn Quarry, Bethesda Archaeological Evaluation (Feature 12) Report #1238.*

Gwynedd Archaeological Trust 2017 Penrhyn Quarry, Bethesda: Soil Strip, Archaeological Watching Brief Report #1410.

Gwynedd Archaeological Trust 2018 *Quarry Realignment Project, Penrhyn Quarry, Bethesda, Archaeological Evaluation and Survey*, GAT unpublished report 1423.

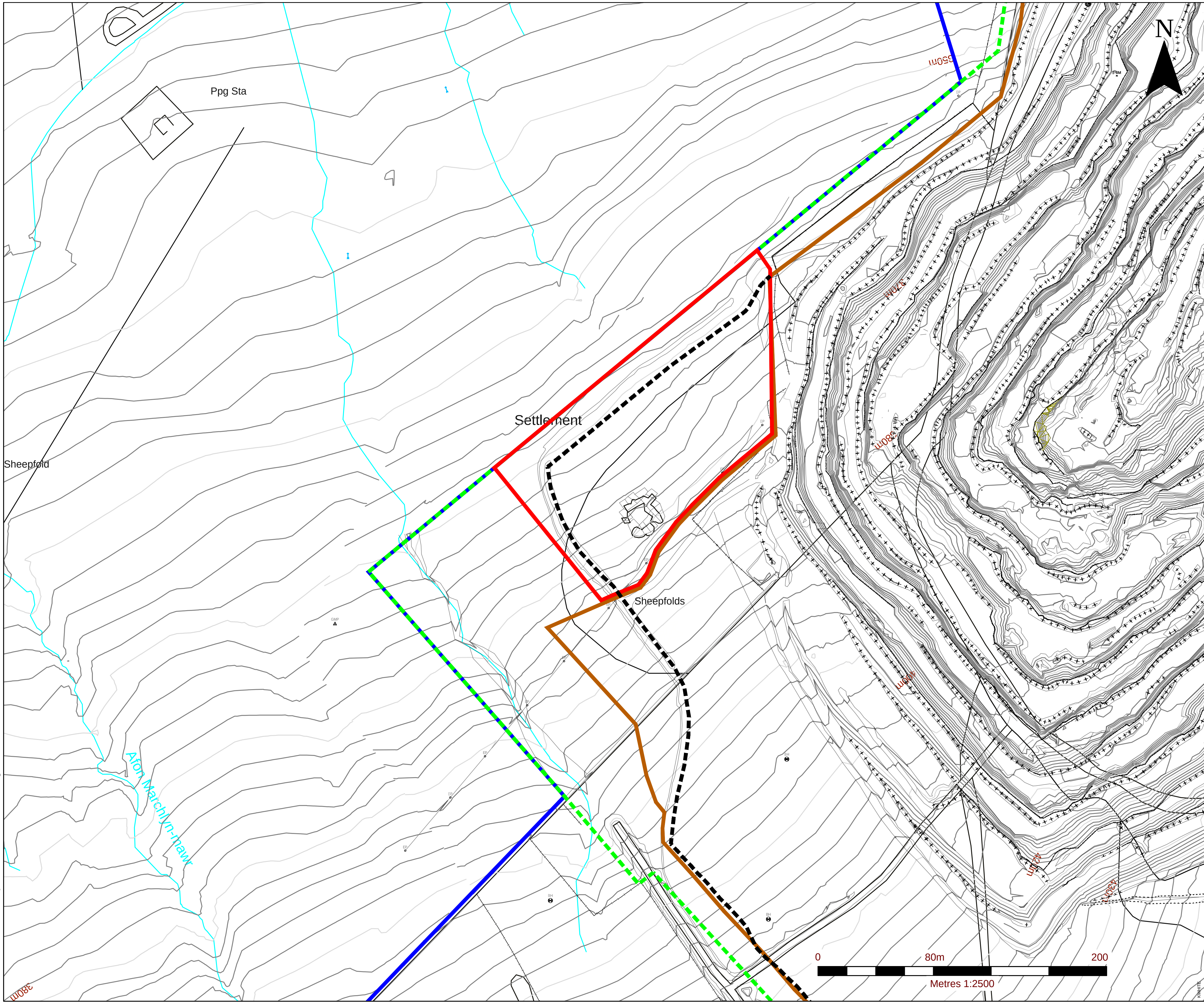
Historic England, 2015, *Management of Research Projects in the Historic Environment (MoRPHE).*

Research Framework for the Archaeology of Wales 2016, *Late Bronze Age and Iron Age Wales*.

The Welsh Archaeological Trusts, 2022, *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* (Version 2).

FIGURE 01

Reproduction of Welsh Slate Penrhyn Quarry, Extension Area Plan PQ 2/3. Scale 1:2500@A3.



NOTES

1. TERRAIN CONTOURS SHOWN IS A COMPOSITE OF TOPO SURVEY DATED 29.10.2018 AND OS TERRAIN 5 DTM DATA FOR CONTEXT.

2. EXTENT OF PERMITTED EXTRACTION IS TAKEN FROM SLR CONSULTING LIMITED DRAWING REF: 02491.16.76_77_78_PENRHYN_WIDENING_EXTENSION 120502.DWG, DRAWING NUMBER: P7/78; REVISION A DATED: MARCH 2012.

LEGEND

- MINING SITE (MINERAL DEVELOPMENTS)
- APPLICATION SITE BOUNDARY
- COMPANY LANDHOLDING
- EXTENT OF PERMITTED EXTRACTION (SEE NOTE 2.)
- EXTENT OF PROPOSED EXTRACTION LIMIT

Figure 01

WELSH SLATE
Part of the Breedon Group

SLR global environmental solutions
2nd and 3rd FLOORS
15 MIDDLE PAVEMENT
NOTTINGHAM
NG1 7DX
T: 01159 647280
F: 01159 751576
www.slrconsulting.com

PENRHYN QUARRY

ENVIRONMENTAL STATEMENT

EXTENSION AREA

PQ 2/3

Scale	Date
1:2500 @ A3	MARCH 2022

403.06559.00021.12.PQ2-3.3 Extension Area.dwg

FIGURE 02

Penrhyn Quarry Realignment Zone with location of Evaluation Trenches &Test Pits. Scale 1:1000 @ A4.

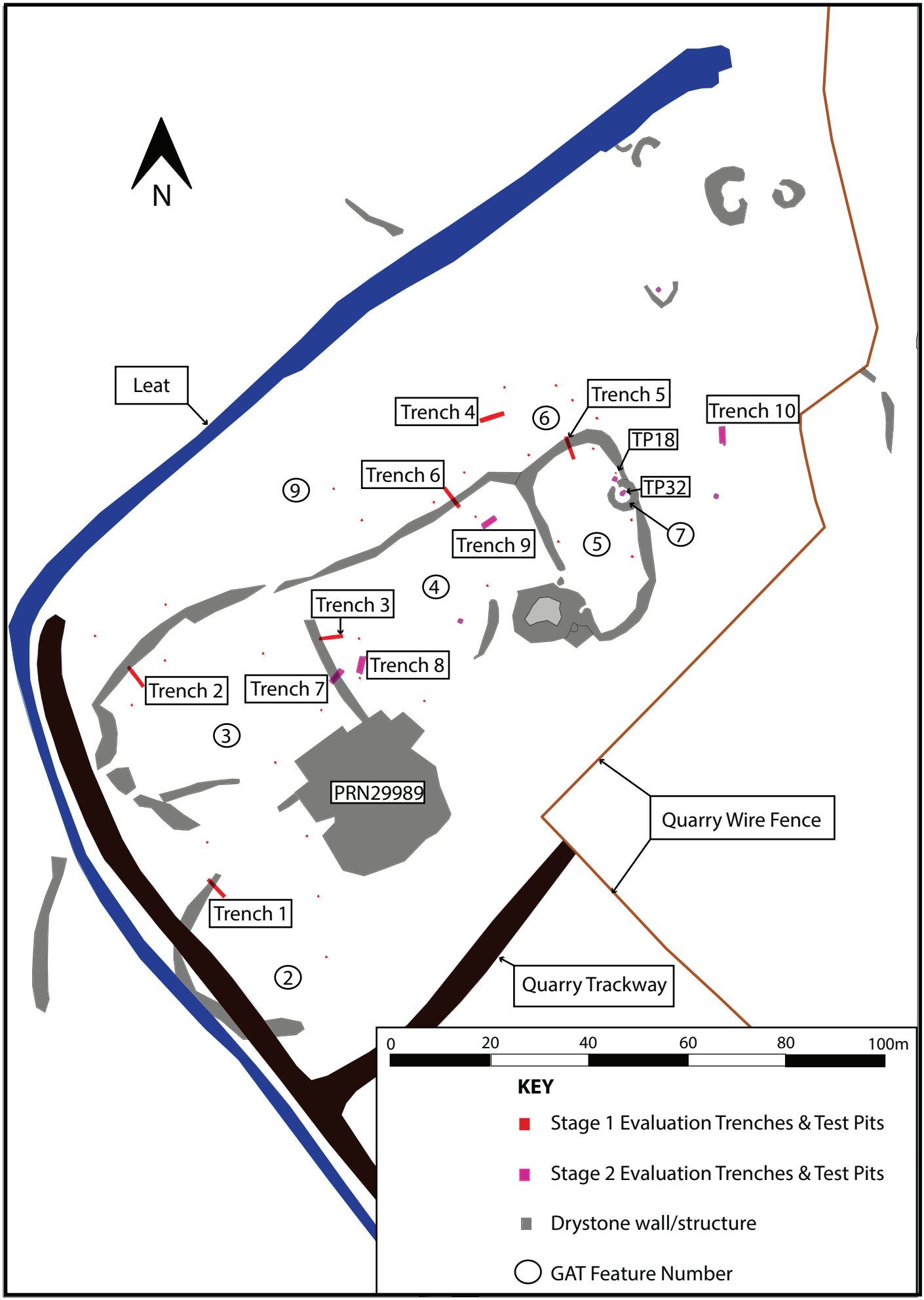


Figure 02: Proposed Quarry Realignment Zone with location of Evaluation Trenches & Test Pits. Scale 1:1000 @ A4

FIGURE 03.

Quarry Realignment Zone and Archaeological Features (reproduced from GAT Report 1397).

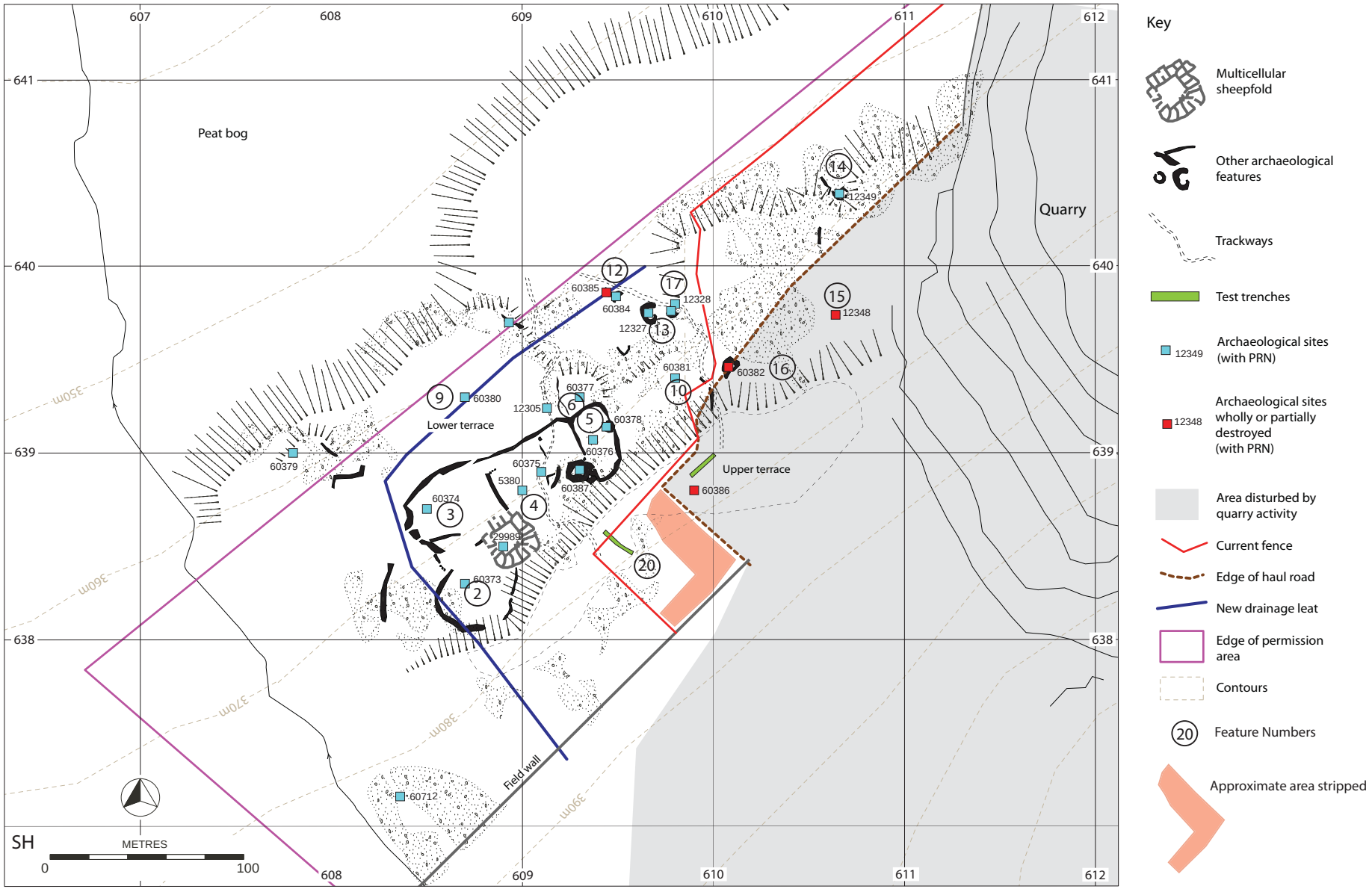


Figure 03 - Quarry Realignment Zone and Archaeological Features (reproduced from GAT Report 1397)

APPENDIX I

Gwynedd Archaeological Trust Photographic Metadata pro-forma

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

Digital Photographic Record

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.

Project Name:			Project Number:				
Photo No.	**Sub - Division**	**Description**	**Contexts**	**Scales**	**View From**	**Initials**	**Date**

APPENDIX II

Gwynedd Archaeological Trust Context Sheet pro-forma

GWYNEDD ARCHAEOLOGICAL TRUST **CONTEXT RECORD FORM**

SITE CODE	**GRID SQUARE**	**SITE SUB-DIV**	**CONTEXT NUMBER**
CATEGORY/TYPE	**PROVISIONAL DATE/PERIOD/PHASE**		
LENGTH	**BREADTH**	**DIAMETER**	**DEPTH/HEIGHT**
DEPOSIT			**CUT**
1. Compaction			1. Shape in plan
2. Colour			2. Corners
3. Matrix Composition			3. Break of slope top
4. Inclusions			4. Sides
5. Clarity of Interface			5. Break of slope base
6. Other comments			6. Base
7. Methods & conditions			7. Orientation
			8. Truncated (if known)
			9. Other comments
			Draw sketches overleaf

FILLED BY	[ ] [ ] [ ] [ ] [ ] [ ] This [ ] context [ ] [ ] [ ] [ ] [ ] [ ]
FILL OF	**Stratigraphic matrix**

PLANS	**SECTIONS**
Sheet No.	Sheet No.
Drawing No.	Drawing No.
PHOTOGRAPHS - Film No./ Frame No.	
SAMPLE Nos.	**FIND Nos.**

FEATURE No		**GROUP No**	**CONSISTS OF**
INTERPRETATION/DISCUSSION		**SAME AS**	

	CHECKED BY (initials/date)	**INITIALS/DATE**

APPENDIX IV

Gwynedd Archaeological Trust 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	15/06/2023
	RCAHMW	On completion of Project Archive
	Storiel, Ffordd Gwynedd, Bangor LL57 1DT	If applicable, post-fieldwork based on artefact recovery
Project Lead / Project Assurance	Gwynedd Archaeological Planning Services	tbc
Landowner / Developer	The Breedon Group/Welsh Slate Limited	06/06/2023

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

Describe below the context of this Selection Strategy. You should refer to:

- The aims and objectives of the project;
- Local Authority guidance (including the brief);

- Research Frameworks;
- The repository collection development policy and/or deposition policy;
- Material-specific guidance documents.

Note: This section may be copied from your Project Design/WSI to ensure all Stakeholders receive this context information.

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

Gwynedd Archaeological Trust (GAT) has been contracted by The Breedon Group/Welsh Slate Limited to prepare a written scheme of investigation (WSI) for archaeological mitigation in advance of quarry realignment at Penrhyn Quarry, Bethesda. The realignment comprises a *c*.6.4ha extension to the existing Penrhyn Quarry incorporating an area of upland to the southwest of the current workings (centred on NGR SH61146396; Figure 01).

The archaeological mitigation will comprise of 3 actions:
1. Record the post-medieval multicellular sheepfold (PRN 29,989) and the various paddocks/enclosures and possible roundhouses that comprise the late prehistoric settlement (PRN 5380).
2. Targeted excavation that will incorporate Feature Number 5, the small, oval shaped paddock, the associated, possible house structures and the eastern end of the adjacent paddock/enclosure Feature Number 4.
3. Further to the completion of the monument record and targeted excavation an archaeological watching brief will be conducted during the soil strip of the quarry extension.

This WSI outlines the methodology for the monument record and targeted excavation alone; the watching brief will have a separate WSI.
The archaeological mitigation is anticipated to be undertaken in the summer of 2023.

Source: Gwynedd Archaeological Trust. 2023. Penrhyn Quarry, Bethesda: Written Scheme of Investigation for Archaeological Mitigation. Prepared for The Breedon Group/Welsh Slate Limited. June 2023. Project G2534.

1 – Digital Data

Stakeholders

Name the individual(s) responsible for the Digital Data Selection decisions (i.e. Archaeological Archive Manager, Project Manager, Collections Curator).

John Roberts (GAT Principal Archaeologist)

Selection

Location of Data Management Plan (DMP)
Selection of digital data elements should be considered in your project's DMP. For the purpose of the Selection Strategy, you can either copy the selection section of your DMP below, or attach it as an appendix to this document. Please indicate here if the DMP is attached.

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;
Pro-formas: all cross referenced and complete;
Photographic Metadata: completed in *Microsoft Excel* and cross-referenced with all pro-formas;
Survey data: downloaded using a Computer Aided Design package;
Sections: all cross referenced and complete;
Plans: all cross referenced and complete;
Context register: quantified and register completed.
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

There is no de-selected data

2 – Documents

Stakeholders

Name the individual(s) responsible for the Documents Selection decisions (i.e. Archaeological Archive Manager, Project Manager, Repository Representative).

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 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 included:
    - Photographic metadata (Excel);
    - Photographic archive (TIFF format);
    - Project Information form (Excel);
    - File Information form (Excel) – Microsoft Word report text final;
    - File Information form (Excel) – Photographic metadata (general);
    - File Information form (Excel) – Adobe PDF report final; and
    - File Information form (Excel) - Photographic metadata (detail).

De-Selected Documents

Describe the procedure for dealing with De-selected material and what specialist advice has informed this procedure.

There is no de-selected data

3 – Materials

Note: This step should be completed for each material component of the archaeological archive. Copy this table for the various materials as required, providing the 'Material Type' and a section identifier (eg. '3.1') for each.

Material type	All artefacts	**Section 3.**	

Stakeholders

Name the individual(s) responsible for the Materials Selection decisions (i.e. Archaeological Archive Manager, Project Manager, Repository Representative).
John Roberts – Principal Archaeologist, Gwynedd Archaeological Trust;
Tom Fildes –Planning Archaeologist, Gwynedd Archaeological Planning Service;

All archaeologically significant artefacts will be retained for further examination and identification. Pottery sherds and other objects of 19th and 20th century date will be examined on site and the context from which they were retrieved noted. Isolated sherds of this date or sherds from the ploughsoil will not be retained, but where deposits are directly related to 19th century activity they will be retained for study. Any artefacts recovered will be treated according to guidelines issued by the UK Institute of Conservation (Watkinson and Neal 2001) in particular the advice provided within *First Aid for Finds* (Rescue 1999) and Historic England.

Any waterlogged artefacts (e.g. wood or leather) that are to be recovered for post-excavation assessment and analysis will be processed in accordance with *Environmental Archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation* (English Heritage, 2011) and specifically in accordance with Brunning and Watson (2010) for waterlogged wood and Historic England (2012) for waterlogged leather. In such cases an external specialist will be contacted to agree an appropriate sampling and recovery strategy.

All finds are the property of the landowner; however, it is Trust policy to recommend that all finds are donated to an appropriate museum (in this case Storiel, Ffordd Gwynedd, Bangor LL57 1DT), where they can be securely stored for potential future study. Access to finds must be granted to the Trust for a reasonable period to allow for analysis and for study and publication as necessary. Trust staff will undertake initial identification, but artefacts will be assessed and analysed by appropriate specialists in the post-excavation phase of the project, using a wide range of consultants used by the Trust, including National Museums and Galleries of Wales at Cardiff.

All finds of treasure must be reported to the coroner for the district within fourteen days of discovery or identification of the items. Items declared Treasure Trove become the property of the Crown, on whose behalf the Portable Antiquities Scheme acts as advisor on technical matters and may be the recipient body for the objects.

The Treasure Valuation Committee, based at the British Museum, and informed by the Portable Antiquities Scheme, will decide whether they or any other museum may wish to acquire the object. If no museum wishes to acquire the object, then the Secretary of State will be able to disclaim it. When this happens, the coroner will notify the occupier and landowner that he intends to return the object to the finder after 28 days unless he receives no objection. If the coroner receives an objection, the find will be retained until the dispute has been settled.

GAT will contact the landowner (via client) for agreement regarding the transfer of artefacts, initially to GAT and subsequently to the relevant museum (Storiel). A GAT produced pro-forma will be issued to the landowner where they are given the option to donate the finds or to record that they want them returning to them once analysis and assessment has been completed. Artefacts will be transferred to the Oriel Ynys Môn in accordance with their guidelines.

Selection

Describe your Selection Strategy for each material type and or object type. To do this you must:

1.1 State the Selection Strategy you are applying to each category of material, how this will be done, and why.
1.2 Identify the selection review points during the project (e.g. project planning, data gathering, analysis and reporting and archive compilation).
1.3 Reference all relevant standards, policies or guidelines (e.g. thematic, period, and regional, Research Frameworks, repository deposition policies) and specialist advice sought.
1.4 Identify any selection decisions that differ from standard guidelines and explain why.

The Materials Selection Template may be useful in structuring this section.

The full material archive returned to the GAT offices will be reviewed following analysis: Stakeholders (see above) will make selection decisions based on specialists reports and selection recommendations and SDMS collecting policy. The selection will take place during archive completion.

Uncollected Material

If you are practising selection in the field, describe the process that will be applied. To do this you must:

- Detail how you will characterise, quantify and record all uncollected material on site.
- Explain how you will dispose of, or re-distribute, uncollected material.

Any uncollected material will be left on-site to be incorporated into backfill.

De-Selected Material

Describe what you will do with the de-selected material. All processed material should have been adequately recorded before de-selection.

All finds will be assessed and recorded to appropriate standards. De-selected material will be returned to the landowner as agreed by the landowner and curatorial archaeologist.

Amendments

Detail any amendments to the above selection strategy here.

Date	Amendment	Rationale	Stakeholders

Materials Selection Template

This table may be inserted into Section 3 of the main Selection Strategy Template to help present differing selection strategies for different material types

Find Type	Selection Strategy	Stakeholders	Review Points

3 – Materials

Note: This step should be completed for each material component of the archaeological archive. Copy this table for the various materials as required, providing the 'Material Type' and a section identifier (eg. '3.1') for each.

Material type	Ecofact samples	**Section 3.**	

Stakeholders

Name the individual(s) responsible for the Materials Selection decisions (i.e. Archaeological Archive Manager, Project Manager, Repository Representative).
John Roberts – Principal Archaeologist, Gwynedd Archaeological Trust;
Tom Fildes –Planning Archaeologist, Gwynedd Archaeological Planning Service;

Should any archaeological features and/or sealed deposits be identified that are deemed suitable for assessment and analysis for ecofacts, bulk soil samples will be taken of not less than 40 litres for bulk samples, or 100% if the feature is smaller. Samples will be taken by GAT staff using 10 litre sampling buckets. Following the excavation the bulk samples will be processed by the GAT Project Archaeologist team using flotation and wet sieving. The samples will then be assessed and analysed for plant species and charcoal, with the results used to inform agrarian practices and wood fuel use, as well as possibly dating. The assessment and analysis, including species identification, will be completed by an ecofact specialist. Any deposits deemed suitable for dating will be submitted to a laboratory specialising in radiocarbon dating (e.g., SUERC).
Bulk soil samples will also be taken to recover small artefacts such as flint debitage or metal-working debris if these are suspected.
Where peat deposits or other organic deposits are encountered other sampling will be considered such as soil monoliths, bulk soil sampling for uncharred plant remains and for insect remains, and pollen coring will be considered, with specialists brought in to carry out sampling and subsequent analysis where appropriate. Buried soil horizons will also be considered for sampling for soil micromorphological analysis.
After analysis processed flots will be deposited in the relevant museum (Storiel).

Selection

Describe your Selection Strategy for each material type and or object type. To do this you must:

2.1 State the Selection Strategy you are applying to each category of material, how this will be done, and why.
2.2 Identify the selection review points during the project (e.g. project planning, data gathering, analysis and reporting and archive compilation).
2.3 Reference all relevant standards, policies or guidelines (e.g. thematic, period, and regional, Research Frameworks, repository deposition policies) and specialist advice sought.
2.4 Identify any selection decisions that differ from standard guidelines and explain why.

The Materials Selection Template may be useful in structuring this section.

The full material archive returned to the GAT offices will be reviewed following analysis: Stakeholders (see above) will make selection decisions based on specialists reports and selection recommendations and SDMS collecting policy. The selection will take place during archive completion.

Uncollected Material

If you are practising selection in the field, describe the process that will be applied. To do this you must:

- Detail how you will characterise, quantify and record all uncollected material on site.
- Explain how you will dispose of, or re-distribute, uncollected material.

Any uncollected material will be left on-site to be incorporated into backfill.

De-Selected Material

Describe what you will do with the de-selected material. All processed material should have been adequately recorded before de-selection.

Any samples taken from features that subsequently prove to be of low archaeological significance may be discarded and the soil will be dumped on site or in an appropriate location before processing.

Amendments

Detail any amendments to the above selection strategy here.

Date	Amendment	Rationale	Stakeholders

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