Pandora Reservoirs, Trefriw, Conwy

Briff Gwylio Archeolegol / Archaeological Watching Brief

Archaeoleg Gwynedd
Heneb
Gwynedd Archaeology

Pandora Reservoirs, Trefriw, Conwy

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Yr Amgylchedd Hanesyddol yn Cofnodi Prif Gyfeirnod /
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Heneb: Ymddiriedolaeth Archaeoleg Cymru.

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01	Minor text edits Inclusion of historic OS Maps for reference	3.3	Approval of Gwynedd Archaeology Planning

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CRYNHODEB ANHECHNEGOL

Heneb: Contractiwyd Archaeoleg Gwynedd (Ymddiriedolaeth Archeolegol Gwynedd gynt) gan BINNIES UK Ltd ar ran CNC i ymgymryd â brîff gwylio archaeolegol o waith daear i wella arglawdd uchaf Cronfa Ddŵr Uchaf Pandora ac arglawdd isaf Cronfa Ddŵr Pandora Isaf. Llwyddodd y briff gwylio i fonitro agweddau allweddol ar y gwaith daear a rhoddodd fwy o fewnwelediad i gyfansoddiad yr argloddiau yn Pandora a gwybodaeth am eu seilwaith. Roedd hefyd yn dogfennu'r newidiadau a wnaed i sefydlogi a gwella'r argloddiau.

NON-TECHNICAL SUMMARY

Heneb: Gwynedd Archaeology (formerly known as Gwynedd Archaeological Trust) was contracted by BINNIES UK Ltd on behalf of NRW to undertake an archaeological watching brief of groundworks to improve the upper embankment of Pandora Upper Reservoir and lower embankment Pandora Lower Reservoir. The watching brief successfully monitored key aspects of the groundworks and provided more insight into the make-up of the embankments at Pandora and information on the infrastructure thereof. It also documented the changes made to stabilise and improve the embankments.

1 INTRODUCTION

Heneb: Gwynedd Archaeology (formerly known as Gwynedd Archaeological Trust) was contracted by BINNIES UK Ltd on behalf of NRW to undertake an archaeological watching brief of groundworks to improve the upper embankment of Pandora Upper Reservoir and lower embankment Pandora Lower Reservoir (centred on NGR SH76966007; postcode LL27 0YX; Figure 01). The site consists of two reservoirs, Pandora Upper and Lower, with the upper being the western of the two, and is accessed via several unclassified roads off the B5106, forestry tracks extend to the southwestern corner of the site. Approximately 160m to the west of the site, beyond a wooded area, lies the former Pandora mine site, which the reservoirs were built to serve as a water retention and water source.

The archaeological mitigation was defined in consultation with BINNIES UK Limited and Heneb: Gwynedd Archaeology Planning (formerly Gwynedd Archaeological Planning Service), are in relation to improving the upper embankment located between Pandora Upper and Pandora Lower reservoirs (Figure 02). The archaeological watching brief incorporated the following:

1) Record of the exposed upper embankment of Pandora Upper Reservoir. The excavation at the location of the breach of the upper embankment of Pandora

2) Upper Reservoir for the new reinforced concrete spillway.

3) Groundworks associated with the formalisation of the breach of the lower embankment Pandora Lower Reservoir.

4) Record of changes to the upper embankment of Pandora Upper Reservoir, such as, the re-profile of the embankment, the new reinforced concrete spillway and the new timber bridge across the width of the new spillway.

The archaeological watching brief was undertaken between January & March 2024, with a final post-completion visit in May 2024, 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 for archaeological monitoring & recording (Chartered Institute for Archaeologists, 2023);
- Universal Guidance for archaeological monitoring & recording (Chartered Institute for Archaeologists, 2023);
- 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).

In line with the regional Historic Environment Record (HER) requirements, the HER was 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, 2020). The HER was informed of the project start date, location, grid reference and estimated timescale; the project was assigned HER Enquiry Number GATHER1997 and the event Primary Reference Number (PRN) is 46744.

1.1 Aims and Objectives

The key aims and objectives were to:

- document and generate a record of the changes made to the upper embankment and the immediate vicinity thereof;
- document the composition and make-up of the existing upper embankment;
- document the proposed groundworks at the lower embankment;
- establish the date and nature of any archaeological remains identified and assess their implications for understanding the historical development of Pandora reservoir, in conjunction with the known archaeological record for the site; and
- to place the results in context (if applicable), with reference made to *A Research Framework for the Archaeology of Wales Version 03, Final Refresh Document* (March 2017).

1.2 Acknowledgements

Heneb: Gwynedd Archaeology would like to thank the following for their contribution and support:

- *GAT Project Team*: John Roberts, Stuart Reilly, and Carolina Ferreira.
- *Client* (*BINNIES UK Ltd*): Liam McCarthy and Myles Harding.
- *NRW & Project Team:* Sherron Kitchen & Aled Hughes.
- *William Hughes Civil Engineering*: Gordon Owens & Andrew Howells.
- *Heneb: Gwynedd Archaeology Planning*: Jenny Emmett.

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

2.1 Introduction

Pandora Reservoir I (PRN 9038; NGR SH77056011) i.e., Pandora Upper Reservoir and Pandora Reservoir II (PRN 9037; NGR SH76936009) i.e., Pandora Lower Reservoir are associated with Pandora Mine and are located at the southwestern end of the mine complex. Pandora Mine is located to the southeast of Llyn Geirionydd and has a recorded history from the 1840s and was last worked in the 1920s. Pandora initially started as a lead mine, but around the end of the 19th century became a zinc producer. Peripheral remains include tramways, reservoirs and leats. During its history the mine has been referred to as Foel Ddu, Willoughby, Pandora, Welsh-Foxdale and the Eagle. However, the name Pandora is in general usage for this mine site (Dutton, Roberts & Vernon, 1995).The Gwaenllifion Post Medieval lead mine was founded in 1838 by the Messrs, Gregory Co. The operation ceased in 1841 and the mine was subsequently operated by several small partnerships until was purchased by Charles Brougham Parry in June 1877, which he sold a year later to the Aberllyn Mining Company. The mine operation at this time consisted of a crusher, jigs and a waterwheel powered circular buddle.

2.2 Recent Work

In March 2021 Gwynedd Archaeological Trust (GAT) was commissioned by BINNIES UK Ltd to undertake an archaeological assessment of Pandora Mine, ahead of the construction of a flow monitoring structure at Pandora Pontifex Level towards the centre of the mine complex (Ryan Young, 2021; GAT Report 1580). The assessment focused on updating the records previously compiled in the 1990s and recorded 20 features within the mine complex, including the Pandora Reservoir I and II. The report concluded that none of the mine features would be adversely affected by the construction of a flow monitoring structure downstream of the Pontifex Adit as the area was altered during the construction of a public car park in 1983. Pandora Reservoir I and II were not visited as part of the walkover survey completed for the assessment.

In March 2022 GAT conducted a photographic record and monitored, as part of an archaeological watching brief, ground investigation works. The purpose of this ground investigation works was to provide the main investigation with contaminated land information to assist in progressing the overall projects design.

The work at Pandora reservoir revealed a site that had changed little since its original construction in 1872 with the earth embankments and drystone wall revetment still intact apart from two deliberate breeches in the centre of each embankment which could possibly correspond with the location of the old sluice gates. The location of the sluice gates and layout of the reservoirs with embankments are documented in the First, Second and Third Edition Ordnance Survey 25-inch to 1-mileCaernarvonshire County Series Maps, published 1889, 1900 and 1913, respectively (see Figures 03, 04 & 05). The ground investigation works revealed that the embankments were constructed from dark blackish brown peaty soil which forms the core of the dam, (Ryan Young, 2022, GAT Report 1608).

3 METHODOLOGY

3.1 Introduction

An archaeological watching brief is defined by the Chartered Institute for Archaeologists as a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme resulted in the preparation of a report and ordered archive (CIfA, 2023).

The archaeological watching brief was overa**ll** conducted on a **partial** basis except for specific actions, such as, the excavation of the spillway through the embankment which was undertaken on an **intensive** basis.

The archaeological watching brief was undertaken on the following actions:

- document and generate a record of the changes made to the upper embankment and the immediate vicinity thereof;
- document the composition and make-up of the existing upper embankment;
- document the proposed groundworks at the lower embankment;
- establish the date and nature of any archaeological remains identified and assess their implications for understanding the historical development of the Pandora reservoirs and specifically the upper embankment, in conjunction with the known archaeological record for the site; and
- to place the results in context (if applicable), with reference made to A Research Framework for the Archaeology of Wales Version 03, Final Refresh Document (March 2017).

The watching brief was conducted on tactical visits to coincide with specific on-site groundworks on 17th & 26th January and 15th March 2024, with a final post groundworks completion site visit on 17th May 2024.

3.2 Fieldwork Methodology

All attendances and photographs were recorded using GAT pro-formas. Photographic images were taken using a digital SLR (Nikon D5100) camera set to maximum resolution (4,928 x 3,264) in RAW format and archived in TIFF format using Adobe Photoshop. A total of 121 photographic images were taken (archive reference numbers G2826_001 to G2826_121; cf. Appendix II for the photographic metadata).

A measured sketch was taken of the sluice gate in upper embankment of Pandora Upper Reservoir; this is depicted in Figure 06.

3.3 Data Management Plan

The fieldwork data has been used as the basis for the physical and digital dataset archives and used to compile the project report. The physical archive has been stored in a designated project folder and the location confirmed in the Trust project database; the digital dataset has been stored on a dedicated Trust server, with the location confirmed in the Trust project database via a specific hyperlink. The de-selected digital data is listed on page four of the Selection Strategy, see Appendix III.

External datasets for the regional HER and RCAHMW are as follows:

- HER: digital report (PDF format) and Event PRN summary (Microsoft Excel format); the report and dataset have been prepared 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
- RCAHMW: a digital report (PDF format) and digital archive dataset have been prepared in accordance with the RCAHMW Guidelines for Digital Archives Version 1. The dataset includes:
    - Photographic metadata (Microsoft Access);
    - Photographic archive (TIFF format);
    - Project Information form (Microsoft Excel);
    - File Information form (Microsoft Excel) – Microsoft Word report text final;
    - File Information form (Microsoft Excel) – Photographic metadata (general);
    - File Information form (Microsoft Excel) – Adobe PDF report final; and
    - File Information form (Microsoft Excel) - Photographic metadata (detail).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, 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 has taken into account:

- The aims and objectives of the project.
- The 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.

The project specific selection strategy is reproduced as Appendix III.

4 RESULTS

4.1 Introduction

Prior to the start of the archaeological watching brief, the groundworks for the project commenced in December 2023, during which the following actions were undertaken:

- Clearance work for a temporary stone access track along the western side of the upper embankment.
- Trees in the vicinity of the upper embankment were felled.
- Tree root balls within footprint of the upper embankment were removed.
- The existing spillway of the upper embankment was infilled.

It was agreed with BINNIES UK Ltd., William Hughes Civil Engineering (the contractor who undertook the groundworks) and Heneb: Gwynedd Archaeology Planning that an archaeologist from Heneb: Gwynedd Archaeology would document the site at the current stage of the works programme in mid-January 2024 and then conduct a watching brief thereafter. Tactical site visits for the archaeological watching brief were conducted on 17th and 26th January 15th and 18th March, with a final site visit on 17th May 2024.

4.2 General Arrangement of Groundworks

The first site visit of the archaeological watching brief was conducted on Friday 26th January 2024. The senior archaeologist documented the work area in the vicinity of the upper embankment of the Pandora Upper Reservoir.

A 3.50m wide stone surfaced access track and work area at the western side of the upper embankment had been installed to allow access to the embankment and breach as part of the groundworks (Plates 1 & 2 and Figure 02). Along the western edge of the work area there were bunds of topsoil/peat that had been cleared from the work area and to expose the underlying bedrock adjacent to the rear of the embankment (Plates 3, 4 & 5). The bunds were approximately 2.0m in height and had been compacted to prevent water ingression. Hessian fabric rolls propped up with wooden posts were set along the front of the bunds.

In preparation for the excavation through the upper embankment, at the location of the breach, the upper reservoir was de-watered with pumps, the water being deposited into the lower reservoir (Plate 5). The lower water levels in the upper reservoir exposed the silted base and sides (Plate 6).

The lower reservoir of Pandora, in comparison, was also heavily silted, but had large concentrations of moss, rushes (Juncus) and grass, along with sporadic wild seeded tree saplings at the sides of the reservoir and close to the southeastern face of the embankment (Plates 7 & 10). The breach at the lower embankment was covered with a thick black plastic tarpaulin to try to prevent further water damage to the structure (Plates 8 & 9).

4.3 Watching Brief

The west face of the upper embankment had been exposed by the site contractor as part of the groundworks, with overgrowth such as heather and long grass being removed. The western façade of the embankment was of drystone build, being an assortment of locally sourced, largely angular or sub-angular, undressed stones and boulders with no obvious coursing. The wall was stepped at the southern end of the embankment, with a distinct ledge. The base of the wall to the ledge had an average height of 0.90m with the remainder of it measuring 1.60m. The stone façade had a maximum height of 3.0m at the location of the breach, just off the centre of the embankment. The height of the embankment steadily decreased from this point as it extended north, with the northern terminal being 0.80m in height. The embankment and associated western facing stone façade varied due to the undulating nature of the ground. It was constructed on top of the underlying shale/schist bedrock, which was more prominent at the northern end of the upper embankment, where there were also quartzite inclusions (Plates 11-13).

The removal of the heather and tarpaulin at the location of the breach also revealed the remains of a sluice set within the western façade. The opening of the sluice was defined by large angular stones, of which a limited number close to the base of the sluice were rectangular in shape and appear to have been roughly dressed. The stone was like what was used in the construction of the western façade, being locally sourced shale or schist. The laying of the stones was more regular, being roughly coursed with the lintel stones at the top of the sluice being long, narrow stones some of which had split and cracked, creating a distinct dip in the embankment and this was likely the cause of the breach. The opening of the sluice had a maximum height of 1.50m and width of 0.90m, although this narrowed to 0.60m at the base of the sluice (Figure 04 & Plate 14). The interior of the sluice was recessed by approximately.

1.0m within the embankment but there was no evident opening to allow water to flow in a controlled manner from the upper reservoir (Plate 15). This may have been due to later disturbance or movement in the structure and the partial collapse of this section of the embankment. The sluice was located roughly at the centre of the upper embankment (Plate

16). An opening for a sluice along the eastern façade of the embankment was not discernible, in part as access was not possible, for practical and safety reasons but the remains of a penstock, represented by a rough ‘A’-frame of timber poles positioned within the upper reservoir, was visible adjacent to the western façade of the upper embankment (Plates 19 &

20).

The western façade of the embankment and sluice were recorded before the excavation at the location of the sluice for the new spillway. The stone façade and sluice were removed by a tracked excavator fitted with an excavation bucket (Plate 17) under archaeological supervision as part of the watching brief. As indicated by the results of the watching brief of the GI works undertaken in 2022, the upper embankment consisted of primarily an earthen core (mix of topsoil and clay) mixed with moderate quantities of stone with drystone wall façade along the western and eastern (reservoir facing) sides (Plate 18).

During the excavation through the embankment for the new spillway a concentration of peat was uncovered. The peat deposit was beneath the main earthen core material (Plates 21 & 22), being concentrated behind the eastern stone façade. It did not appear to be an in-situ deposit rather it had been dumped at this location as part of the construction of the embankment. The peat was dark brown and friable with a high concentration of partially composted plant material.

To enable the excavation through the upper embankment for the new spillway, a coffer dam, initially comprised of placing a series of bulk bags to enclose a portion of the upper reservoir adjacent to the work area (Plates 21 & 22). The water level within the upper reservoir was also reduced with the water pumped out and directed into the lower reservoir. The silt within the area of the coffer dam was removed with the tracked excavator and dumpers. Excavation of the base of the reservoir had to extend a greater depth than anticipated, by an additional 2.0m to reach solid ground before the initial pour of concrete blinding. To allow the additional depth, a steel coffer dam (Plates 23 & 24) was installed to allow this to be safely undertaken. The solid ground within the spillway excavation was comprised of cohesive mid-grey clay and outcrops of bedrock (Plate 25) and the upper embankment was built on top of this natural deposit (Plate 26).

Further to the completion of the excavation and construction of the reinforced concrete spillway with broad crested weir, the sides of the spillway were enclosed with timber fencing and a timber footbridge was inserted. The upper embankment was raised and re-profiled, with imported mid-grey clay placed along the downstream (western) face of the embankment, rip rap (loose quarried stone) placed along the upstream (eastern) face and the top of the embankment was levelled with fine gravel (Plates 27-32).

4.4 Lower Embankment of Pandora Lower Reservoir

The lower embankment of Pandora lower reservoir, was located downslope of the upper embankment and reservoir (Figures 02 & 07). It was heavily overgrown with turf, thick grass and moss, with small concentrations of heather and dead ferns. The western stone façade of the embankment was most evident while the eastern façade was barely visible due to overgrowth and the silting of the lower reservoir. The western stone façade of the lower embankment had a maximum exposed height of 1.30m, topped with approximately 0.80m of turf. It was comprised of uncoursed, undressed, rough locally sourced schist/shale stones of drystone construction. The lower embankment had an approximate width of 3.90m (Plates 33-35).

To gain access to the lower embankment with a tracked excavator, bog mats were placed along the southwestern edge of the lower reservoir (Plate 36). The scope of the groundworks at this location was more limited, with the aim being to formalise and stabilise the breach through the lower embankment. The area either side of the breach was de-turfed with the tracked excavator fitted with a toothless bucket and the existing breach was widened slightly with the removal of the upper courses of the stone façades and the surface of the earthen core (Plates 37-39). The removal of the turf and overgrowth exposed the peaty soil and the remnants of the eastern stone façade. It extended approximately 1.0m east from the earthen core of the embankment and had a surviving height of 1.0m (Plates 40 & 41). The façade consisted of loose angular and sub-angular locally sourced schist/shale stones. The black plastic sheeting was also removed to expose more of the western façade of the embankment and the possible remains of a small sluice (Plate 42). The possible blocked up sluice was defined by rectilinear lintel and base stone, although it was not as clearly defined as the sluice in the upper embankment. The interior measured approximately 0.50m in height and 0.50m in width, having been backfilled with stone or blocked up with movement of the embankment. The entrance to the sluice was demarcated by timber beamed penstock set within the lower reservoir, parallel to the embankment. These were removed as part of the groundworks. The penstock comprised of four pine timbers, the largest of which measured 2.40m in length and had a diameter of 0.15m. The remnants of the penstock paddle were also recovered. This consisted of a square timber paddle which measured 0.30m by 0.30m and was 0.05m thick. The paddle was bolted onto a long, narrow cast iron rod, that was 3.25m long with a diameter of 0.04m (Plates 43-45).

Downslope of and parallel to the lower embankment a rectangular trench was excavated, being 6.0m long, 2.0m wide and 0.9m deep to receive rip rap and provide additional support to the embankment at the location of the breach. It was excavated through heavily organic peat which had a depth of 0.40m and cut into the underlying alluvial material of boulders

mixed with loose light grey clayey gravel (Plate 46). A channel was excavated off the trench, for a distance of 3.0m, with a width of 1.50m and depth of 0.9m (Plate 47). No archaeological deposits or material associated with the reservoir was uncovered during the excavation and the peat was not sampled.

4.5 Post demobilisation site visit

A final visit was conducted of the site once the groundworks had been completed and the contractor had demobilised. The peat and soil from the bunds had been reinstated across the work area adjacent to the downstream of the upper embankment (Plate 48) and used to cover the west face and reseeded (Plate 49). The stone revetment channel, poured concrete embedded with stones, had been laid to the western opening of the spillway (Plate 50). A new aluminium penstock with control had been inserted within the spillway, next to the foot bridge (Plate 51) and the upper reservoir allowed to re-fill with water (Plate 52).

At the lower embankment, the breach had been covered over with composite turf reinforcement matt and loose quarry stones (Plate 52). The trench had been backfilled as planned with rip rap (loose quarry stones) and the embankment sealed by restored soil and peat, this also partially covered the western stone façade (Plate 53).

5 CONCLUSIONS

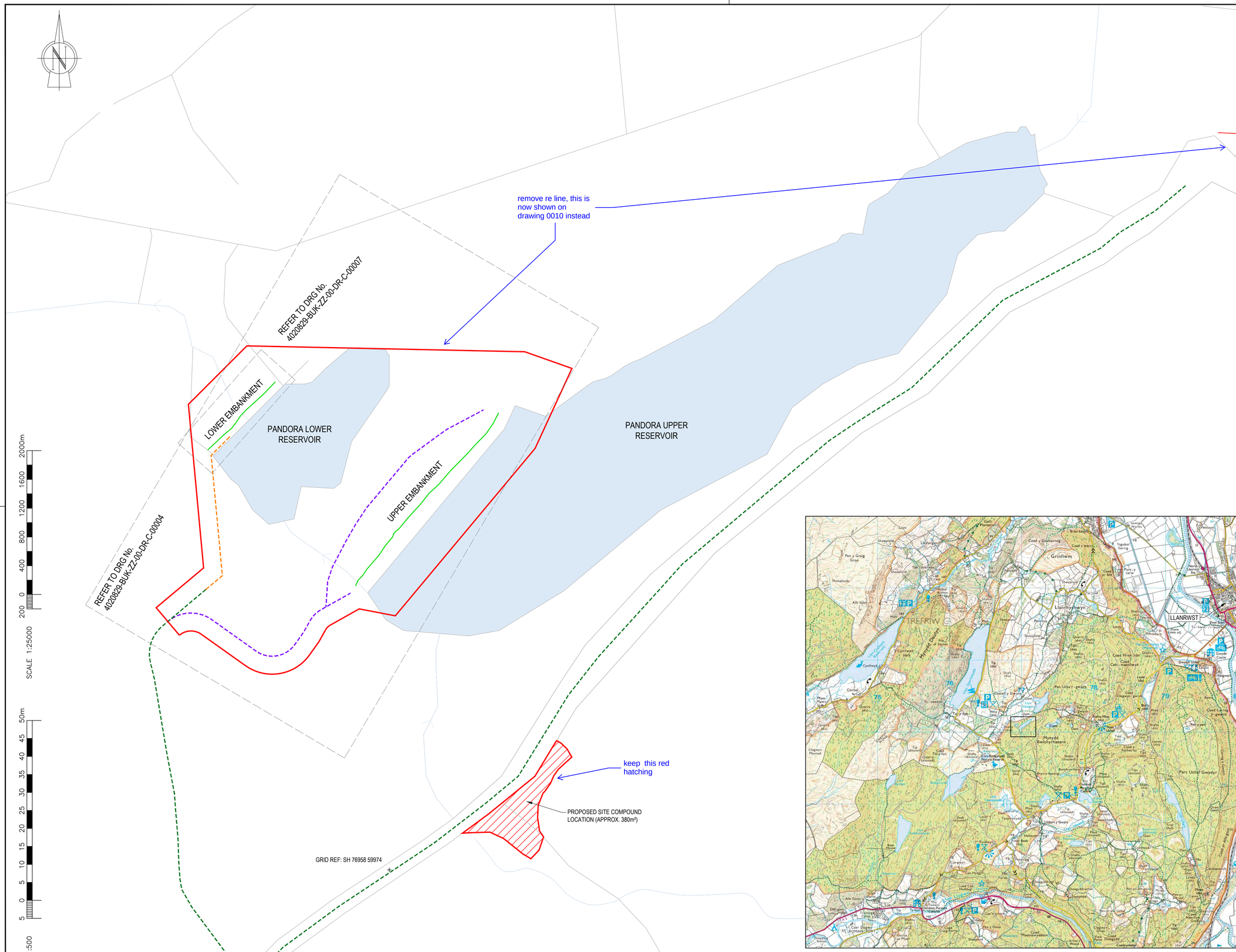
Heneb: Gwynedd Archaeology was contracted by BINNIES UK Ltd on behalf of NRW to undertake an archaeological watching brief of groundworks to improve the upper embankment of Pandora Upper Reservoir and lower embankment Pandora Lower Reservoir. The watching brief successfully monitored key aspects of the groundworks and provided more insight into the make-up of the embankments at Pandora and information on the infrastructure thereof. It confirmed the results of the earlier watching brief of the GI works (GAT Report 1608) that the embankments had a largely earthen core, flanked by battered drystone walls. They were constructed from locally sourced materials that were readily to hand and were in all likelihood quickly erected. While the watching brief did not supervise the removal of peat in the work area adjacent to the upper embankment, based on observations of the bunded material and what was removed during groundworks at the lower embankment, it would have been of limited archaeological interest. The peat deposits were poorly developed and appeared to be largely composed of fresh-looking vegetation of no great age. Given the location, it is likely the peat had been disturbed by the creation of the reservoirs and embankments and consisted of relatively fresh organic material washed down from the surrounding slopes. The groundworks had a moderate impact on the upper embankment in particular but given the good quality of work undertaken, most of this should in time blend in with the original infrastructure of the site.

6 SOURCES CONSULTED

1) Chartered Institute for Archaeologists, 2020, Standard and guidance for the collection, documentation, conservation and research of archaeological materials.
2) Chartered Institute for Archaeologists, 2023, Universal Guidance for archaeological monitoring& recording.
3) English Heritage, 1991, Management of Archaeological Projects (MAP2).
4) Historic England, 2015, Management of Research Projects in the Historic Environment (MoRPHE).
5) Ryan Young, Carol, 2021, Pandora Mine, Trefriw, Conwy, Archaeological Assessment. GAT Report 1580.
6) Ryan Young, Carol, 2021, Pandora Mine, Trefriw, Conwy, Archaeological Watching Brief. GAT Report 1608.
7) The Welsh Archaeological Trusts, 2022, Guidance for the Submission of Data to the Welsh
8) Historic Environment Records (HERs) (Version 2).

FIGURE 01

Reproduction of Drawing No. 4020829-BUK-ZZ-00-DR-C-00002, Location Plan.



PLAN

SCALE 1:500

LOCATION PLAN

SCALE 1:25000

Note: The limits, including the height and depths of the Works, shown in this drawing are not to be taken as limiting the obligations of the contractor under Contract.

NOTES:

1. ALL DIMENSIONS IN METRES AND ALL LEVELS IN METRES RELATIVE TO ORDNANCE DATUM (OD), UNLESS NOTED OTHERWISE.

GENERAL LEGEND:

- EXTENT OF WORKING AREA
- PROPOSED TEMPORARY CONSTRUCTION ACCESS (BOGMAT TRACK)
- PROPOSED CONSTRUCTION AND PERMANENT ACCESS (STONE TRACK)
- FORESTRY ROAD (CLASS C)
- WATER COURSE
- OPEN WATER

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
IN ADDITION TO THE HAZARDS OR RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, THE FOLLOWING SIGNIFICANT RESIDUAL RISKS SHOULD BE NOTED. FURTHER DETAILS ARE INCLUDED IN THE CDM DESIGN RISK MANAGEMENT REGISTER
CONSTRUCTION :
S.1 RISK OF EMBANKMENT INSTABILITY AND BREACH OF RESERVOIR. S.2 RISK OF MOBILISING CONTAMINATED SILT DURING DRAWDOWN OF THE RESERVOIR. S.3 RISK OF DAMAGING FEATURES PROTECTED BY THE SSSI ENCOMPASSING THE SITE.
MAINTENANCE, CLEANING AND OPERATION :
M.1 RISK OF FALL FROM HEIGHT AS NO EDGE PROTECTION PRESENT ALONG THE DAM CREST.
DECOMMISSIONING OR DEMOLITION :
RISKS ARE LIKELY TO BE SIMILAR TO THE CONSTRUCTION STAGE BUT SHOULD BE RECONSIDERED IN ADVANCE OF DECOMMISSIONING, DEMOLITION, FUTURE REFURBISHMENT OR REPLACEMENT.

Rev	Drawn	Chkd	Rvwd	Apprvd	Date	Description
P01	SPJ	MC	SPC	SPC	06/09/22	For Client Comment and Review
P02	SPJ	MC	SPC	SPC	19/12/22	Outline Design

Designed by: GLe Date: 17/02/22

Status
S5 Suitable for Client Acceptance

Client
Cyfoeth Naturiol Cymru Natural Resources Wales

Client Project No. | Revision

Binnies UK Limited
Spring Lodge, 172 Chester Road, Helsby, Cheshire, WA6 0AR, UK.
Tel: +44(0)1737 774155

Project
PANDORA RESERVOIR IMPROVEMENTS

Drawing title
LOCATION PLAN

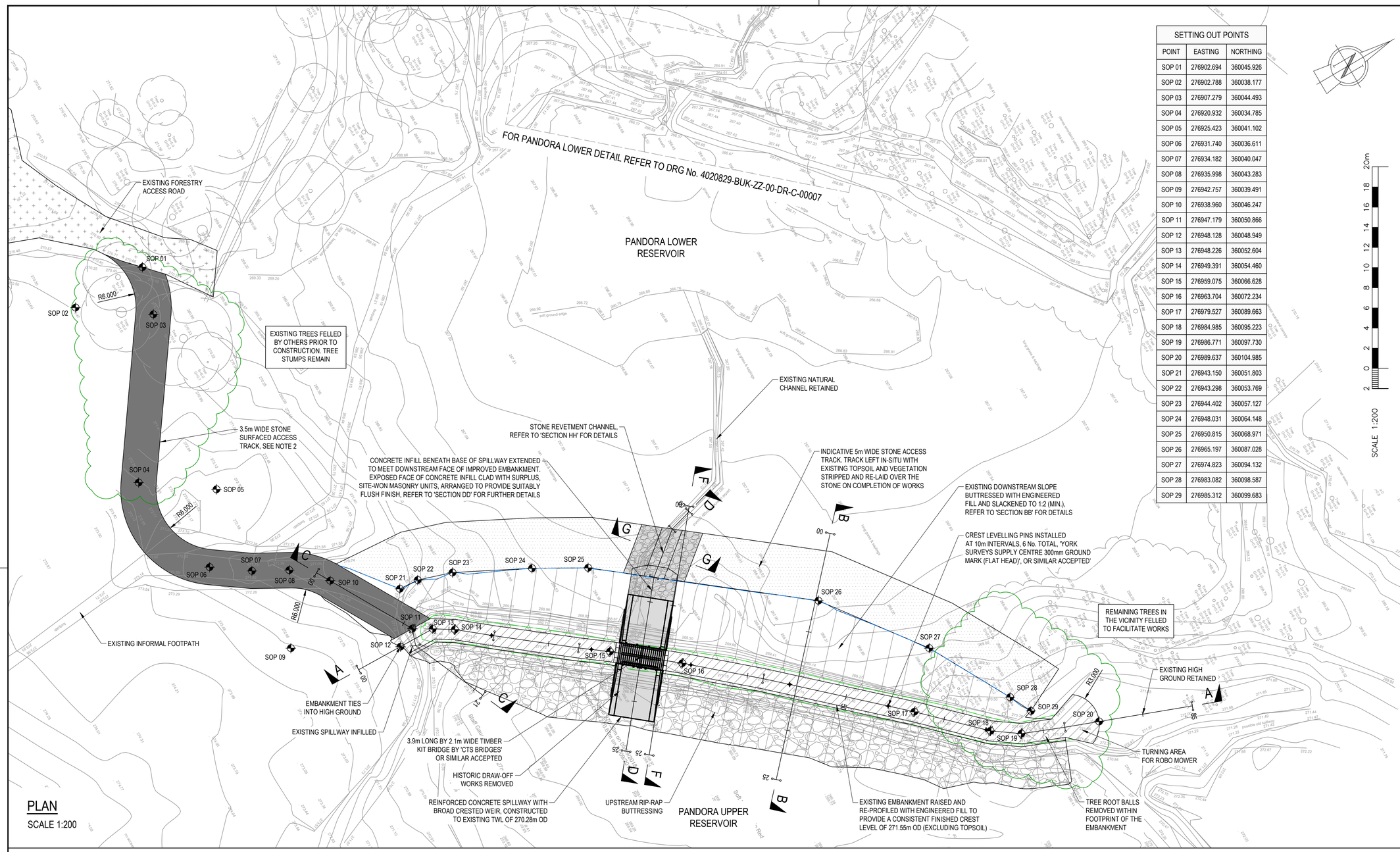
Drawing scale: AS SHOWN Sheet size: A1

Drawing no. 4020829-BUK-ZZ-00-DR-C-00002 | Revision P02

ON PROJECTWISE

FIGURE 02

Reproduction of Drawing No. 4020829-BUK-ZZ-00-DR-C-00004, General Arrangement and Long section plan.



PLAN
SCALE 1:200

SETTING OUT POINTS		
POINT	EASTING	NORTHING
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SOP 02	276902.788	360038.177
SOP 03	276907.279	360044.493
SOP 04	276920.932	360034.785
SOP 05	276925.423	360041.102
SOP 06	276931.740	360036.611
SOP 07	276934.182	360040.047
SOP 08	276935.998	360043.283
SOP 09	276942.757	360039.491
SOP 10	276938.960	360046.247
SOP 11	276947.179	360050.866
SOP 12	276948.128	360048.949
SOP 13	276948.226	360052.604
SOP 14	276949.391	360054.460
SOP 15	276959.075	360066.628
SOP 16	276963.704	360072.234
SOP 17	276979.527	360089.663
SOP 18	276984.985	360095.223
SOP 19	276986.771	360097.730
SOP 20	276989.637	360104.985
SOP 21	276943.150	360051.803
SOP 22	276943.298	360053.769
SOP 23	276944.402	360057.127
SOP 24	276948.031	360064.148
SOP 25	276950.815	360068.971
SOP 26	276965.197	360087.028
SOP 27	276974.823	360094.132
SOP 28	276983.082	360098.587
SOP 29	276985.312	360099.683

Note: The limits, including the height and depths of the Works, shown in this drawing are not to be taken as limiting the obligations of the contractor under Contract.

NOTES:
1. ALL DIMENSIONS IN METRES AND ALL LEVELS IN METRES RELATIVE TO ORDNANCE DATUM (OD), UNLESS NOTED OTHERWISE.
2. ACCESS TRACK SPECIFICATION DETERMINED BY TEMPORARY WORKS DESIGN. MINIMUM REQUIREMENTS ARE 200mm DEEP CRUSHED STONE, WITH A 75mm CRUSHER RUN SURFACING COURSE. MINIMUM CROSS-SLOPE OF 5%. MINIMUM 1:2 GRADIENT SIDE SLOPES FOR THE TRACK.

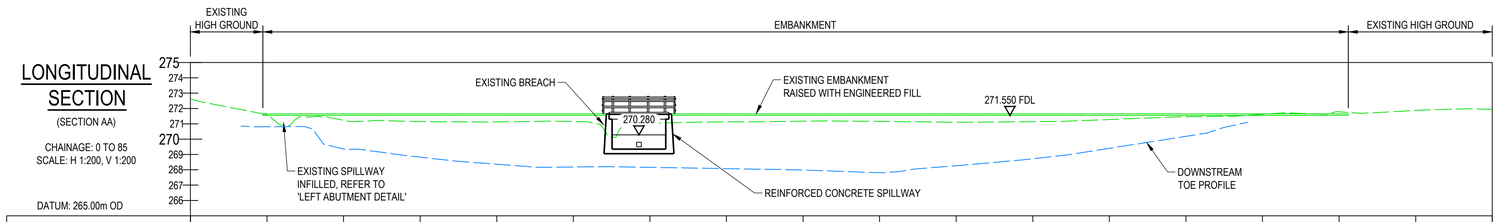
GENERAL LEGEND:
- EXISTING CREST
- DOWNSTREAM TOE
- EXISTING FORESTRY ACCESS TRACK
- PERMANENT ACCESS TRACK
- CREST
- CREST LEVELLING PIN
- CONCRETE
- RECYCLED MASONRY CAST INTO CONCRETE
- TEMPORARY ACCESS TRACK

REFERENCES:
- 4020829-BUK-ZZ-00-DR-C-00005 SECTIONS
- 4020829-BUK-ZZ-00-DR-C-00006 SPILLWAY PLAN & SECTIONS
- 4020829-BUK-ZZ-00-DR-C-00007 PANDORA LOWER BREACH FORMALISATION PLAN AND SECTIONS

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
IN ADDITION TO THE HAZARDS OR RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, THE FOLLOWING SIGNIFICANT RESIDUAL RISKS SHOULD BE NOTED. FURTHER DETAILS ARE INCLUDED IN THE CDM DESIGN RISK MANAGEMENT REGISTER
CONSTRUCTION :
S.1 RISK OF EMBANKMENT INSTABILITY AND BREACH OF RESERVOIR. S.2 RISK OF MOBILISING CONTAMINATED SILT DURING DRAWDOWN OF THE RESERVOIR. S.3 RISK OF DAMAGING FEATURES PROTECTED BY THE SSSI ENCOMPASSING THE SITE.
MAINTENANCE, CLEANING AND OPERATION :
M.1 RISK OF FALL FROM HEIGHT AS NO EDGE PROTECTION PRESENT ALONG THE DAM CREST.
DECOMMISSIONING OR DEMOLITION :
RISKS ARE LIKELY TO BE SIMILAR TO THE CONSTRUCTION STAGE BUT SHOULD BE RECONSIDERED IN ADVANCE OF DECOMMISSIONING, DEMOLITION, FUTURE REFURBISHMENT OR REPLACEMENT.

LONGITUDINAL SECTION
(SECTION AA)

CHAINAGE: 0 TO 85
SCALE: H 1:200, V 1:200
DATUM: 265.00m OD



CHAINAGE	00.000	05.000	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000	55.000	60.000	65.000	70.000	75.000	80.000	85.000
EXISTING CREST LEVEL (CENTRELINE)	272.82	271.60	271.23	271.14	271.13	271.15	271.03	271.13	271.17	271.16	271.11	271.14	271.28	271.47	271.62	271.78	271.87	271.94
DOWNSTREAM TOE LEVEL		270.81	269.36	268.83	268.36	268.18	268.51	269.24	267.99	267.81	268.27	268.72	270.07	270.55				

Rev	Drawn	Chkd	Rvwd	Apprvd	Date	Description
P01	SPJ	MC	SPC	SPC	06/09/22	For Client Comment and Review
P02	SPJ	MC	LJM	SPC	01/12/22	Outline Design
P03	SPJ	MC	SPC	SPC	09/03/23	Detailed Design
C01	SPJ	MC	SPC	SPC	30/06/23	For Client Acceptance

Designed by: GLe Date: 01/09/22

Status
A4 Authorized Stage Complete - Technical Design (100%)

Client
Cyfoeth Naturiol Cymru Natural Resources Wales

Client Project No. | Revision

Binnies UK Limited
Spring Lodge, 172 Chester Road, Helsby, Cheshire, WA6 0AR, UK.
Tel: +44(0)1737 774155

Project
PANDORA RESERVOIR IMPROVEMENTS

Drawing title
GENERAL ARRANGEMENT AND LONG-SECTION

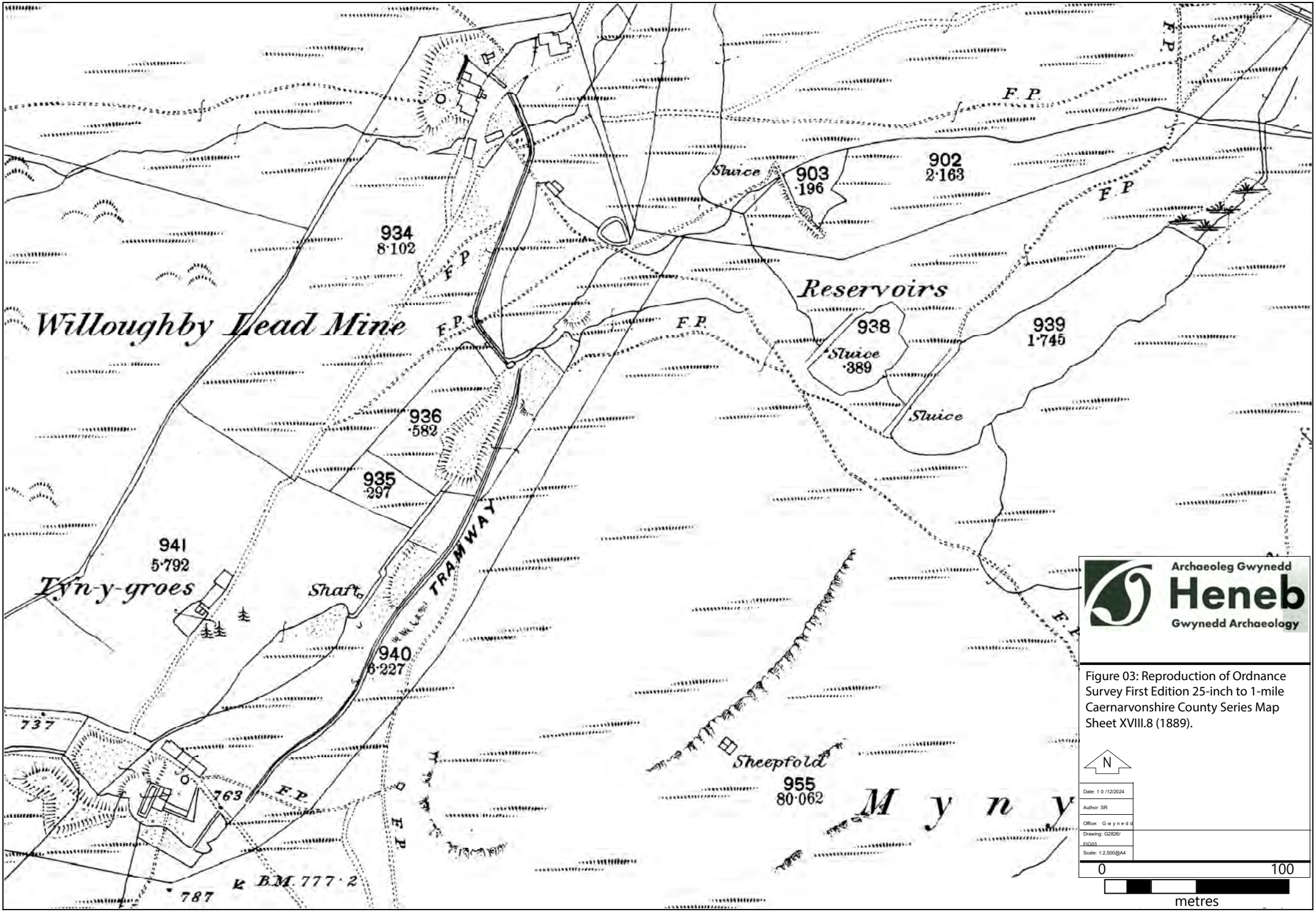
Drawing scale: 1:200 Sheet size: A1

Drawing no. 4020829-BUK-ZZ-00-DR-C-00004 | Revision C01

ON PROJECTWISE

FIGURE 03

Reproduction of Ordnance Survey First Edition 25-inch to 1-mile Caernarvonshire County Series Map Sheet XVIII.8 (1889).



Archaeoleg Gwynedd
Heneb
Gwynedd Archaeology

Figure 03: Reproduction of Ordnance Survey First Edition 25-inch to 1-mile Caernarvonshire County Series Map Sheet XVIII.8 (1889).

N

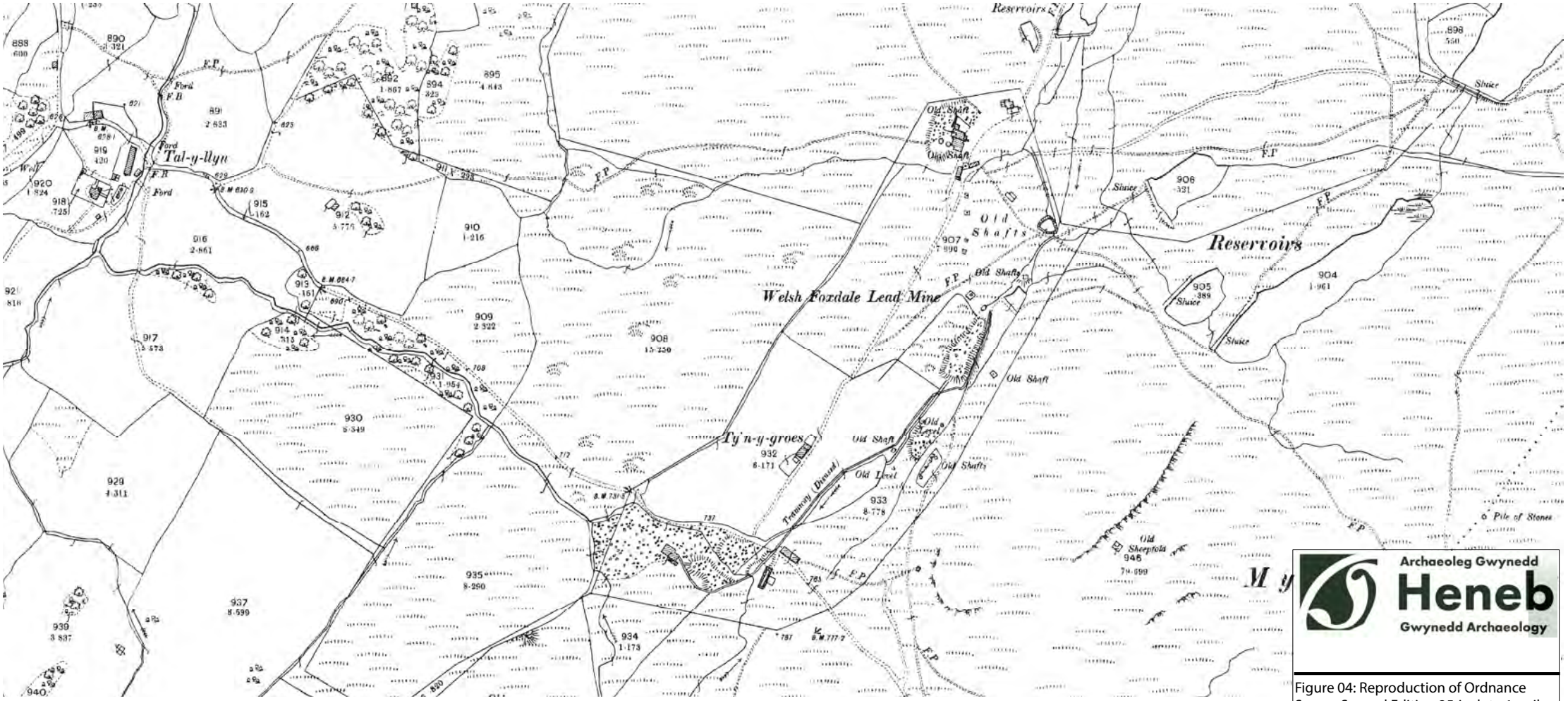
Date: 1 0 /12/2024	
Author: SR	
Office: G w y n e d d	
Drawing: G2826/FIG03	
Scale: 1:2,500@A4	

0 100

metres

FIGURE 04

Reproduction of Ordnance Survey Second Edition 25-inch to 1-mile Caernarvonshire County Series Map Sheet XVIII.8 (1900).



Archaeoleg Gwynedd
Heneb
Gwynedd Archaeology

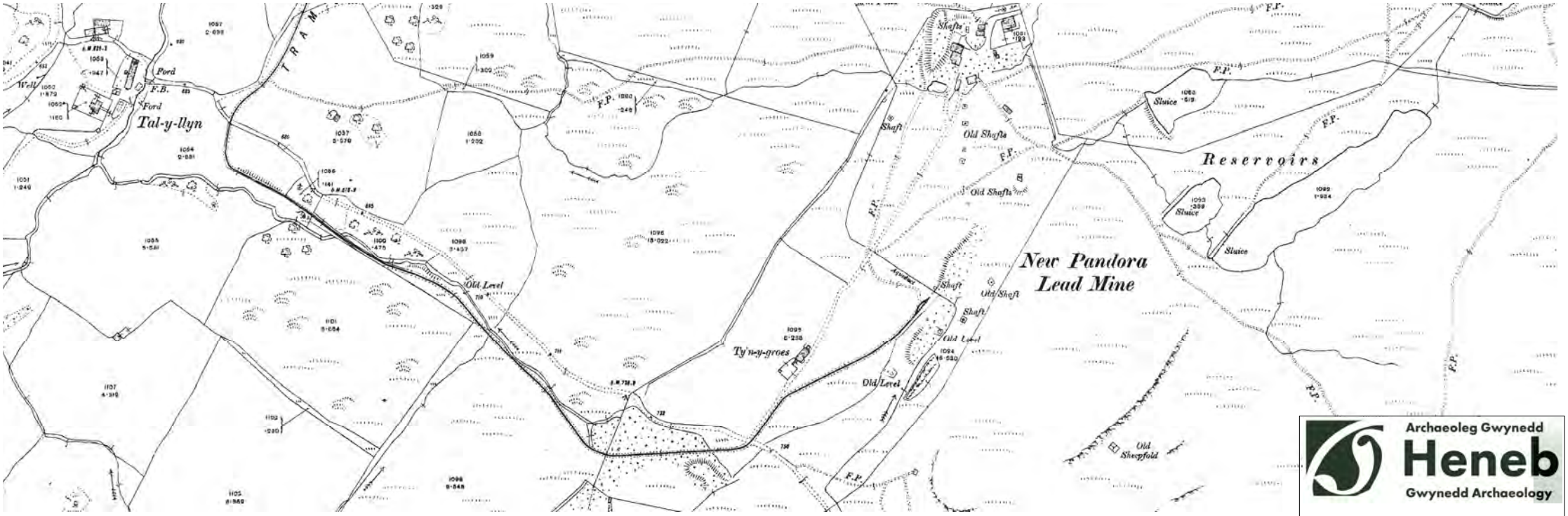
Figure 04: Reproduction of Ordnance Survey Second Edition 25-inch to 1- mile Caernarvonshire County Series Map Sheet XVIII.8 (1900).

N

Date: 1 0 /12/2024	
Author: SR	
Office: G w y n e d d	
Drawing: G2826/FIG04	
Scale: 1:2,500@A4	

FIGURE 05

Reproduction of Ordnance Survey Third Edition 25-inch to 1-mile Caernarvonshire County Series Map Sheet XVIII.8 (1913).



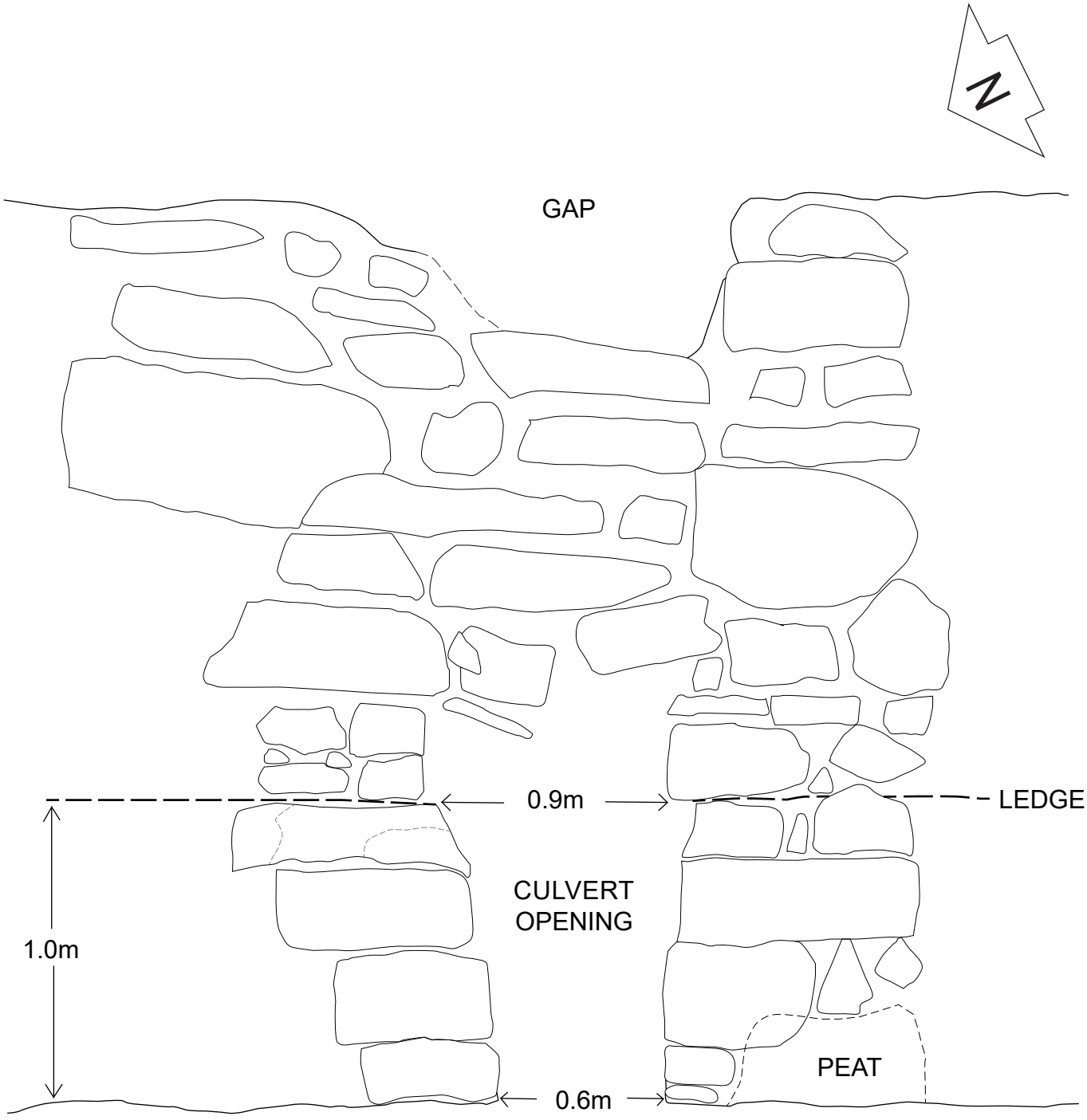
Archaeoleg Gwynedd
Heneb
Gwynedd Archaeology

Figure 05: Reproduction of Ordnance Survey Third Edition 25-inch to 1- mile Caernarvonshire County Series Map Sheet XVIII.8 (1913).

N

FIGURE 06

West-Northwest facing elevation of sluice in Upper Embankment. Not to scale sketch drawing@A4.



Archaeoleg Gwynedd
Heneb
Gwynedd Archaeology

FIGURE 06:

West-Northwest facing section of culvert; Scale:Not to scale (Sketch Section)@ A4.

Date: 01/03/2024

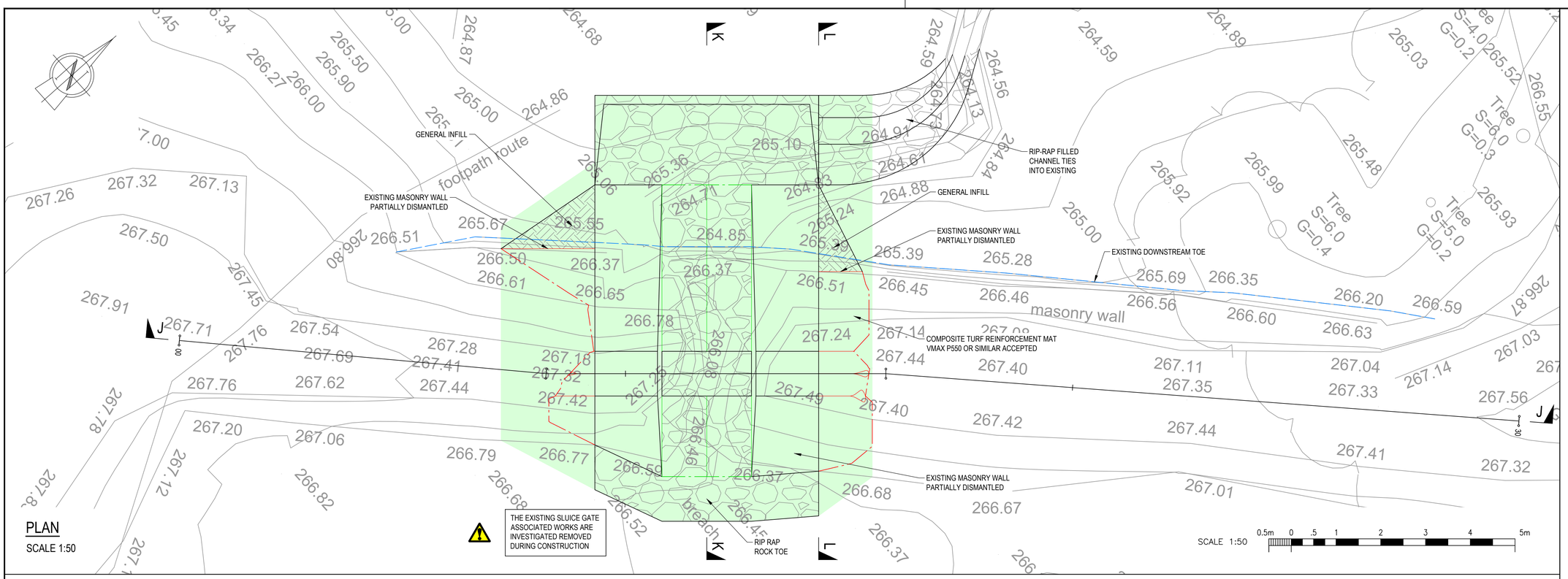
Author: CF

Office: Heneb Gwynedd Archaeology

Drawing: G2826/ Sketch of culvert section.

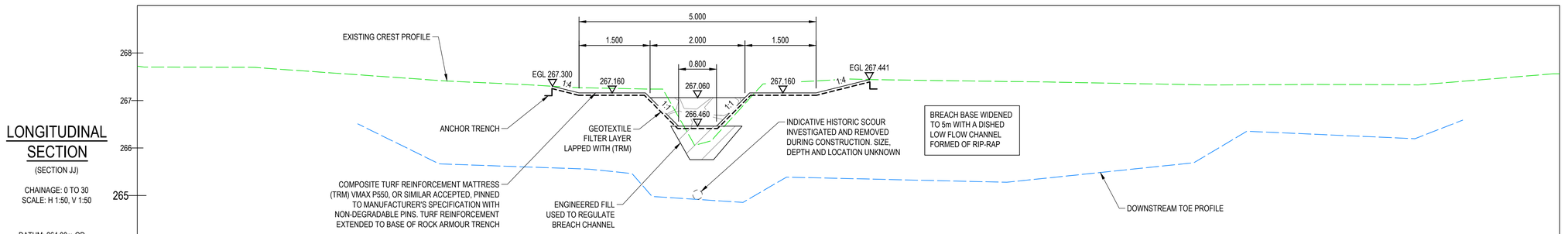
FIGURE 07

Reproduction of Drawing No. 4020829-BUK-ZZ-00-DR-C-00007, Pandora Lower Breach Formalisation Plan and Sections.



PLAN

SCALE 1:50



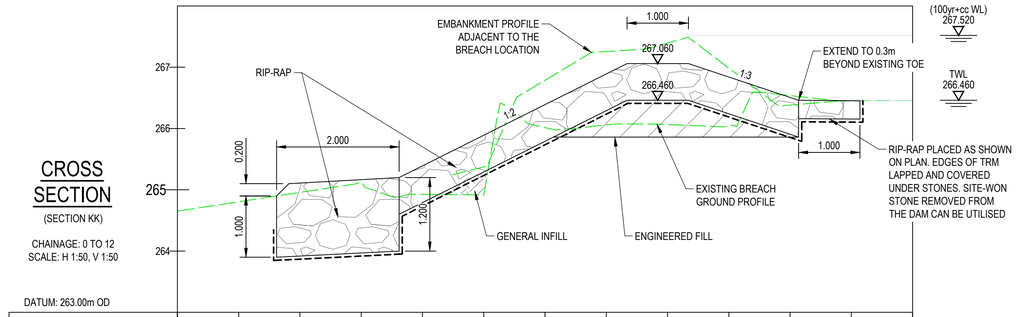
LONGITUDINAL SECTION

(SECTION JJ)

CHAINAGE: 0 TO 30
SCALE: H 1:50, V 1:50

DATUM: 264.00m OD

CHAINAGE	00.000	01.000	02.000	03.000	04.000	05.000	06.000	07.000	08.000	09.000	10.000	11.000	12.000	13.000	14.000	15.000	16.000	17.000	18.000	19.000	20.000	21.000	22.000	23.000	24.000	25.000	26.000	27.000	28.000	29.000	30.000
EXISTING CREST LEVEL (CENTRELINE)	267.72	267.70	267.70	267.66	267.59	267.52	267.45	267.39	267.34	267.29	267.26	267.24	266.12	267.14	267.40	267.45	267.43	267.42	267.40	267.39	267.37	267.36	267.34	267.33	267.33	267.34	267.33	267.33	267.41	267.49	267.56
DOWNSTREAM TOE LEVEL						266.34	265.85	265.64	265.61	265.57	265.51	264.97	264.90	264.98	265.38	265.36	265.33	265.31	265.29	265.35	265.45	265.56	265.66	266.11	266.33	266.28	266.24	266.22			



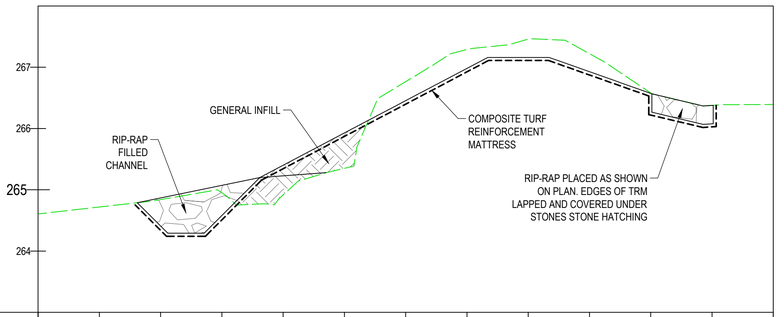
CROSS SECTION

(SECTION KK)

CHAINAGE: 0 TO 12
SCALE: H 1:50, V 1:50

DATUM: 263.00m OD

CHAINAGE	00.000	01.000	02.000	03.000	04.000	05.000	06.000	07.000	08.000	09.000	10.000	11.000	12.000
GROUND LEVEL (EXISTING)	264.65	264.80	264.96	265.13	264.93	264.92	266.02	266.06	266.07	266.04	266.54	266.45	266.46



CROSS SECTION

(SECTION LL)

CHAINAGE: 0 TO 12
SCALE: H 1:50, V 1:50

DATUM: 263.00m OD

CHAINAGE	00.000	01.000	02.000	03.000	04.000	05.000	06.000	07.000	08.000	09.000	10.000	11.000	12.000
GROUND LEVEL (EXISTING)	264.61	264.72	264.84	264.95	264.92	265.35	266.77	267.29	267.46	267.22	266.58	266.38	266.39

Note: The limits, including the height and depths of the Works, shown in this drawing are not to be taken as limiting the obligations of the contractor under Contract.

NOTES:
1. ALL DIMENSIONS IN METRES AND ALL LEVELS IN METRES RELATIVE TO ORDNANCE DATUM (OD), UNLESS NOTED OTHERWISE.

GENERAL LEGEND:

- RIP-RAP
- TURF REINFORCEMENT MAT
- EARTH INFILL
- DOWNSTREAM TOE

REFERENCES:
4020829-BUK-ZZ-00-DR-C-00002 LOCATION PLAN

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
IN ADDITION TO THE HAZARDS OR RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, THE FOLLOWING SIGNIFICANT RESIDUAL RISKS SHOULD BE NOTED. FURTHER DETAILS ARE INCLUDED IN THE CDM DESIGN RISK MANAGEMENT REGISTER
CONSTRUCTION :
S.1 RISK OF EMBANKMENT INSTABILITY AND BREACH OF RESERVOIR. S.3 RISK OF DAMAGING FEATURES PROTECTED BY THE SSSI ENCOMPASSING THE SITE.
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Rev	Drawn	Chkd	Rvwd	Apprvd	Date	Description
P01	SPJ	MC	SPC	SPC	22/11/22	For Client Comment and Review
P02	SPJ	MC	SPC	SPC	09/03/23	Detailed Design
C01	SPJ	GL	SPC	SPC	07/07/23	For Construction

Designed by: GLe Date: 24/10/22

Status
A4 Authorized Stage Complete - Technical Design (100%)

Client
Cyfoeth Naturiol Cymru Natural Resources Wales

Client Project No. | Revision

Binnies UK Limited
Spring Lodge, 172 Chester Road, Helsby, Cheshire, WA6 0AR, UK.
Tel: +44(0)1737 774155

Project
PANDORA RESERVOIR IMPROVEMENTS

Drawing title
PANDORA LOWER BREACH FORMALISATION PLAN AND SECTIONS

Drawing scale: 1:50 Sheet size: A1

Drawing no. 4020829-BUK-ZZ-00-DR-C-00007 Revision C01

ON PROJECTWISE

Plate 1: View of upper embankment and work area from access track; Scale: Not used; view from W (archive reference: G2826_010).

Plate 2: View of north area next to embankment; Scale: Not used; view from NE (archive reference: G2826_036).

Plate 3: Peat/vegetation clearance bund for trackway access; Scale: 1x2m; view from E (archive reference: G2826_038).

Plate 4: Exposed bedrock along northwest side of upper embankment; Scale: Not used; view from NNE (archive reference: G2826_047).

Plate 5: Work area with access track and lower reservoir visible; Scale: Not used; view from NE (archive reference: G2826_048).

Plate 6: View of silted up, de-watered upper reservoir; Scale: Not used; view from W (archive reference: G2826_049).

Plate 7: Silted lower reservoir with site works in background; Scale: Not used; view from W (archive reference: G2826_057).

Plate 8: Tarpaulin covered breach through lower embankment; Scale: Not used; view from NNE (archive reference: G2826_058).

Plate 9: Western face of lower embankment; Scale: Not used; view from NNE (archive reference: G2826_059).

Plate 10: Eastern face of lower embankment; Scale: Not used; view from ENE (archive reference: G2826_060).

Plate 11: Western face of embankment with ledge; Scale: 1x2m and 1x1m; view from W (archive reference: G2826_032).

Plate 12: Location view of embankment wall set on bedrock; Scale: Not used; view from WSW (archive reference: G2826_016).

Plate 13: Northern end of embankment with bedrock in foreground; Scale: 1x1m; view from W (archive reference: G2826_052).

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APPENDIX I

Reproduction of Heneb Gwynedd Archaeology Written Scheme of Investigation.

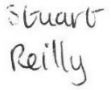
PANDORA RESERVOIRS, TREFRIW, CONWY (G2826)

WRITTEN SCHEME OF INVESTIGATION FOR ARCHAEOLOGICAL WATCHING BRIEF

Prepared for BINNIES UK Ltd

January 2024

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

Approvals Table				
	Role	**Printed Name**	**Signature**	**Date**
Originated by	Document Author	Stuart Reilly		18/01/2024
Reviewed by	Document Reviewer	John Roberts		18/01/2024
Approved by	Principal Archaeologist	John Roberts		18/01/2024

Revision History			
Rev No.	**Summary of Changes**	**Ref Section**	**Purpose of Issue**
01	Greater clarity on level of watching brief. Photo record to include anything that is not safely accessible. Inclusion of Further Archaeological Works Ecofacts – column samples rather than bulk samples Additional information on post-excavation process Text edits selection strategy	3.1 3.2 3.3 3.5 3.6 Appendix III	At request of GAPS

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

PANDORA RESERVOIRS, TREFRIW, CONWY (G2826)

WRITTEN SCHEME OF INVESTIGATION FOR ARCHAEOLOGICAL WATCHING BRIEF

Prepared for *BINNIES UK Ltd*, January 2024

CONTENTS

1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) has been contracted by BINNIES UK Ltd on behalf of to prepare a written scheme of investigation (WSI) for an archaeological watching brief of groundworks to improve the upper embankment of Pandora Upper Reservoir and lower embankment Pandora Lower Reservoir (centred on NGR SH76966007; postcode LL27 0YX; Figure 01). The site consists of two reservoirs, Pandora Upper and Lower, with the upper being the western of the two, and is accessed via a number of unclassified roads off the B5106, forestry tracks extend to the southwestern corner of the site. Approximately 160m to the west of the site, beyond a wooded area, lies the former Pandora mine site, which the reservoirs were built to serve as a water retention and water source.

The majority of the groundworks are in relation to improving the upper embankment located between Pandora Upper and Pandora Lower reservoirs (Figure 02). The groundworks comprise of (but are not limited to):

1) Stone access track (5m wide) along the western side of the upper embankment.

2) Trees in the vicinity of the upper embankment to be felled.

3) Tree root balls removed within footprint of the embankment.

4) The existing spillway infilled.

5) The insertion of a new reinforced concrete spillway through the upper embankment at the location of a breach.

6) The new spillway will extend roughly northwest toward the Pandora Lower Reservoir and link in with an existing natural channel.

7) The remainder of the embankment will be re-profiled, buttressed and raised.

8) A new timber bridge will be placed across the width of the new spillway

<u>The groundworks commenced in December 2023 with actions 1) to 3) being undertaken and completed in the absence of an archaeologist.</u>

More limited groundworks will also be undertaken on the lower embankment of Pandora Lower Reservoir (Figure 03). The groundworks will focus on a breach of the embankment and will include but not limited to the following actions:

i. Sections of the masonry wall adjacent to the breach will be dismantled;

ii. An indicative historic scour will be investigated and removed;

iii. The breach base will be widened to 5.0m with a dished low flow channel formed of rip-rap;

iv. Geotextile filter layer and turf reinforcement mattress will be laid across the area of the breach.

The archaeological watching brief will be undertaken between January & March 2024 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 for archaeological monitoring & recording (Chartered Institute for Archaeologists, 2023);
- Universal Guidance for archaeological monitoring & recording (Chartered Institute for Archaeologists, 2023);
- 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:

- document and generate a record of the changes made to the upper embankment and the immediate vicinity thereof;
- document the composition and make-up of the existing upper embankment;
- document the proposed groundworks at the lower embankment;
- establish the date and nature of any archaeological remains identified and assess their implications for understanding the historical development of the Pandora reservoirs and specifically the upper embankment, in conjunction with the known archaeological record for the site; and
- to place the results in context (if applicable), with reference made to *A Research Framework for the Archaeology of Wales Version 03, Final Refresh Document* (March 2017).

1.2 Monitoring Arrangements

The archaeological watching brief will be monitored by the Gwynedd Archaeological Planning Service (GAPS); both the written scheme of investigation and all subsequent reporting must be approved by GAPS before final issue. GAPS contact details are:

- Jenny Emmett | jenny.emmett@heneb.co.uk | 07824481052.
- Tom Fildes | tom.fildes@heneb.co.uk | 07920264232.

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 **GATHER1991**, and the event primary reference number is **46744**.

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

Pandora Reservoir I (PRN 9038; NGR SH77056011) i.e., Pandora Upper Reservoir and Pandora Reservoir II (PRN 9037; NGR SH76936009) i.e., Pandora Lower Reservoir are associated with Pandora Mine and are located at the southwestern end of the mine complex. Pandora Mine is located to the south east of Llyn Geirionydd and has a recorded history from the 1840s and was last worked in the 1920s. Pandora initially started as a lead mine, but around the end of the 19th century became a zinc producer. Peripheral remains include tramways, reservoirs and leats. During its history the mine has been referred to as Foel Ddu, Willoughby, Pandora, Welsh-Foxdale and the Eagle. However, the name Pandora is in general usage for this mine site (Dutton, Roberts & Vernon, 1995).

2.2 Recent work

In March 2021 Gwynedd Archaeological Trust (GAT) was commissioned by BINNIES UK Ltd to undertake an archaeological assessment of Pandora Mine, ahead of the construction of a flow monitoring structure at Pandora Pontifex Level towards the centre of the mine complex (Ryan Young, 2021; GAT Report 1580). The assessment focused on updating the records previously compiled in the 1990s and recorded 20 features within the mine complex, including the Pandora Reservoir I and II. The report concluded that none of the mine features would be adversely affected by the construction of a flow monitoring structure downstream of the Pontifex Adit as the area was altered during the construction of a public car park in 1983. Pandora Reservoir I and II were not visited as part of the walkover survey completed for the assessment.

In March 2022 GAT conducted a photographic record and monitored, as part of an archaeological watching brief, ground investigation works. The purpose of this ground investigation works was to provide the main investigation with contaminated land information to assist in progressing the overall projects design.

The work at Pandora reservoir revealed a site that had changed little since its original construction in 1872 with the earth embankments and drystone wall revetment still intact apart from two deliberate breeches in the centre of each embankment which could possibly correspond with the location of the old sluice gates. The ground investigation works revealed that the embankments were constructed from dark blackish brown peaty soil which forms the core of the dam, (Ryan Young, 2022, GAT Report 1608).

3 METHODOLOGY

3.1 Introduction

An archaeological watching brief is defined by the Chartered Institute for Archaeologists as a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive (CIfA, 2023).

An archaeological watching brief can be divided into four categories:

- comprehensive (present during all ground disturbance)
- intensive (present during sensitive ground disturbance)
- intermittent (viewing the trenches after machining)
- partial (as and when seems appropriate).

The archaeological watching brief will on the whole be conducted on a **partial** basis but for specific actions, such as, the excavation of the spillway through the embankment will be undertaken on an **intensive** basis.

The archaeological watching brief will undertake the following actions:

- document and generate a record of the changes made to the upper embankment and the immediate vicinity thereof;
- document the composition and make-up of the existing upper embankment;
- document the proposed groundworks at the lower embankment;
- establish the date and nature of any archaeological remains identified and assess their implications for understanding the historical development of the Pandora reservoirs and specifically the upper embankment, in conjunction with the known archaeological record for the site; and
- to place the results in context (if applicable), with reference made to *A Research Framework for the Archaeology of Wales Version 03, Final Refresh Document* (March 2017).

3.2 Fieldwork Methodology

- A photographic record conducted by GAT will detail the site during and after the groundworks;
- The photographic record will form the basis for the archaeological record of the site and for when aspects of the groundworks cannot be safely accessed or safely recorded manually;
- All attendances and photographs will be recorded using GAT pro-formas (cf. Appendices I and II). The records will include topsoil and subsoil depths, the composition of the upper embankment and if viable comment on the make-up of the peaty ground to the immediate west of the upper embankment. Archaeological features and horizons will be recorded on GAT pro-formas with detailed notations and will be recorded photographically with an appropriate scale;
- Photographic images will be taken using a digital SLR camera set to maximum resolution in RAW format; a photographic record will be maintained on site using GAT pro-formas and digitised in *Microsoft Access* 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 **G2826_001**. A photographic ID board will be used to record site code, image orientation and any relevant context numbers; scale bars of appropriate size and quantity will be used, both for general images and for individual features/feature groups;
- Any archaeological features/deposits/structures encountered will be manually cleaned and examined to determine extent, function, date and relationship to adjacent activity; and
- Any required sections and plans to be drawn at a minimum 1:10 scale using GAT A4, A3 or A2 pro-forma permatrace (whichever is appropriate to the size/scale of the drawing); section datums will be recorded.

Should dateable artefacts 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.*

3.3 Further Archaeological Works

The identification of significant archaeological features during the watching brief may necessitate the production of a new project design and the submission of new cost estimates to the client.

The application of a further archaeological works design (FAWD) will be dependent on the initial identification, interpretation and examination of an archaeological feature and the identification of activity that cannot be addressed within the provisions of the current design, for example, burials or structures. The requirement for an FAWD will be determined in conjunction with GAPS through established communication lines and the monitoring process.

The FAWD will be instigated through a GAT produced document that will include:

- feature specific methodologies;
- artefact and ecofact specialist requirements, with detail of appropriate sampling strategies and specialist analysis;
- timings, staffing and resourcing;
- additional costs.

The FAWD document will need to be approved by GAPS.

3.4 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 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 Cadw, 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 Conwy Archives, Conwy Culture Centre, Town Ditch Road, Conwy LL32 8NU), 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 (Conwy Archives). 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 Conwy Archives in accordance with their guidelines.

3.5 Ecofacts

Should any archaeological features and/or sealed deposits be identified that are deemed suitable for assessment and analysis, bulk ecofact samples will be taken by the GAT Project Archaeologist team through column samples. The deposits will 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. Initial assessment would be completed by the GAT Project Archaeologist team using wet sieving, with the subsequent species identification assessment completed by an ecofact specialist (Jackaline 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).

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 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 fieldwork report will be produced which will detail and synthesise the results.

If artefacts and ecofacts are recovered during archaeological fieldwork it will be recommended in the fieldwork report that further assessment and analysis will be required. This will be discussed with client and GAPS. The post-excavation stage of the archaeological mitigation will consist of the following actions:

a) Ecofact processing (i.e. processing the soil samples through wet sieving and residue sorting);

b) Ecofact Assessment & Analysis – examination of plant materials and charred wood taken from the processed soil samples;

c) Artefact Assessment & Analysis;

d) Radiocarbon dating of selected plant material and/or charred wood to provide dates of archaeological activity within the boundaries of the project;

e) FINAL report which ties together all of the above information;

f) Report submitted to GAT HER & National Archives; and

g) Article published in Archaeology in Wales (archaeological journal).

3.7 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 (if relevant)
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 of the watching brief report, 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).

3.8 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 Senior or Project Archaeologist(s). The Senior/Project Archaeologist will be responsible for following:

- All archaeological mitigation duties on site;
- Client/sub-contractor liaison;
- Cadw liaison, with regular updates;
- 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

7.1 Public/Products Liability

Limit of Indemnity- £5,000,000 any one occurrence and in the aggregate in respect of Product Liability

INSURER Ecclesiastical Insurance Office Plc.

POLICY TYPE Public/Products Liability

POLICY NUMBER UN/000375

EXPIRY DATE 22nd August 2024

7.2 Employers Liability

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

INSURER Ecclesiastical Insurance Office Plc.

POLICY TYPE Employers Liability

POLICY NUMBER 24765101 CHC / UN/000375

EXPIRY DATE 22nd August 2024

7.3 Professional Indemnity

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

INSURER Hiscox Insurance Company Limited

POLICY TYPE Professional Indemnity

POLICY NUMBER PL-PSC10002389775/00

EXPIRY DATE 22nd August 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 the collection, documentation, conservation and research of archaeological materials.*

Chartered Institute for Archaeologists, 2023, *Universal Guidance for archaeological monitoring & recording.*

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

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

Ryan Young, Carol, 2021, *Pandora Mine, Trefriw, Conwy, Archaeological Assessment.* GAT Report 1580.

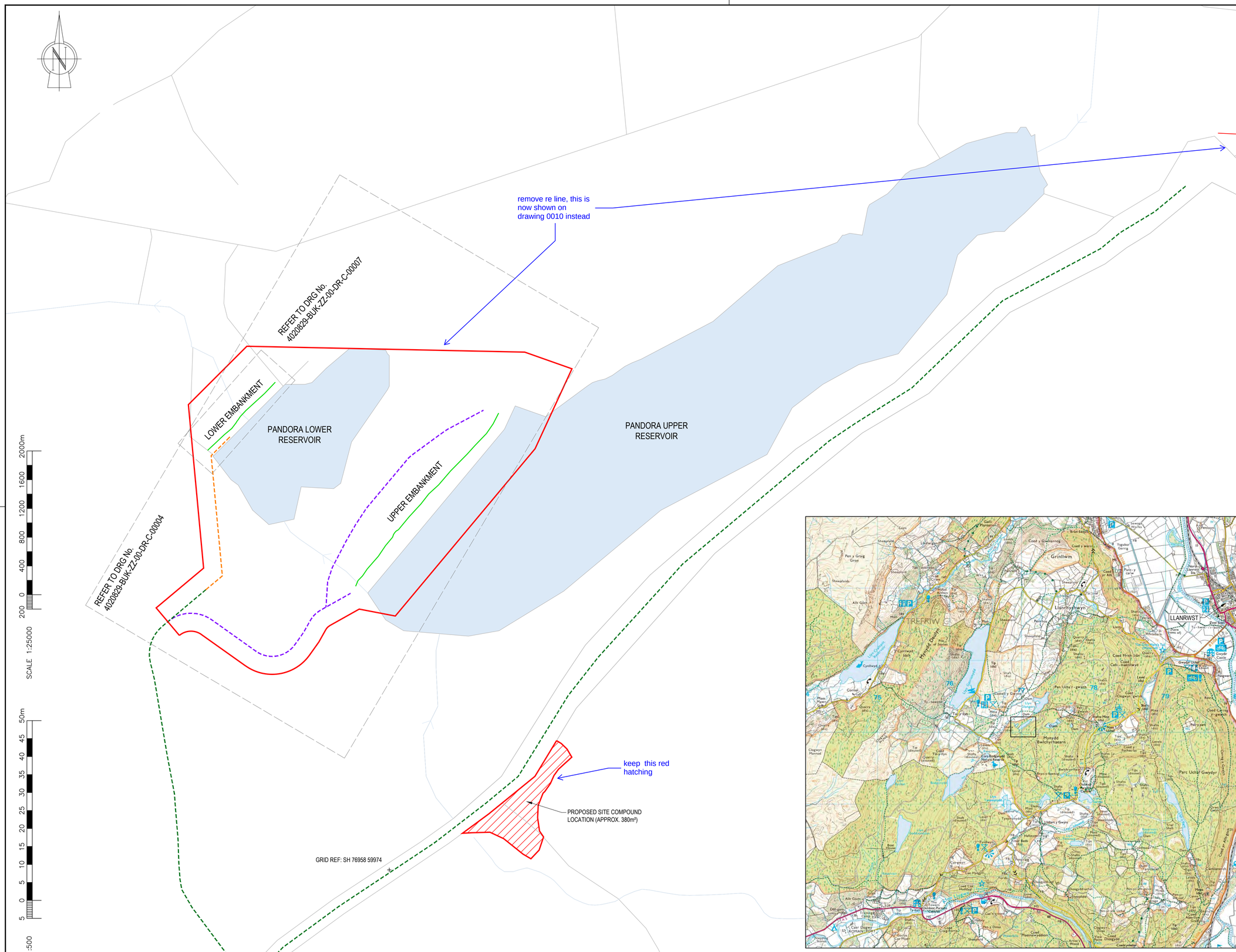
Ryan Young, Carol, 2021, *Pandora Mine, Trefriw, Conwy, Archaeological Watching Brief.* Gat Report 1608.

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

Watkinson, D and Neal, V, 2001, First aid for finds (3rd edition).

FIGURE 01

Reproduction of Drawing No. 4020829-BUK-ZZ-00-DR-C-00002, Location Plan.



PLAN

SCALE 1:500

LOCATION PLAN

SCALE 1:25000

Note: The limits, including the height and depths of the Works, shown in this drawing are not to be taken as limiting the obligations of the contractor under Contract.

NOTES:

1. ALL DIMENSIONS IN METRES AND ALL LEVELS IN METRES RELATIVE TO ORDNANCE DATUM (OD), UNLESS NOTED OTHERWISE.

GENERAL LEGEND:

- EXTENT OF WORKING AREA
- PROPOSED TEMPORARY CONSTRUCTION ACCESS (BOGMAT TRACK)
- PROPOSED CONSTRUCTION AND PERMANENT ACCESS (STONE TRACK)
- FORESTRY ROAD (CLASS C)
- WATER COURSE
- OPEN WATER

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
IN ADDITION TO THE HAZARDS OR RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, THE FOLLOWING SIGNIFICANT RESIDUAL RISKS SHOULD BE NOTED. FURTHER DETAILS ARE INCLUDED IN THE CDM DESIGN RISK MANAGEMENT REGISTER
CONSTRUCTION :
S.1 RISK OF EMBANKMENT INSTABILITY AND BREACH OF RESERVOIR. S.2 RISK OF MOBILISING CONTAMINATED SILT DURING DRAWDOWN OF THE RESERVOIR. S.3 RISK OF DAMAGING FEATURES PROTECTED BY THE SSSI ENCOMPASSING THE SITE.
MAINTENANCE, CLEANING AND OPERATION :
M.1 RISK OF FALL FROM HEIGHT AS NO EDGE PROTECTION PRESENT ALONG THE DAM CREST.
DECOMMISSIONING OR DEMOLITION :
RISKS ARE LIKELY TO BE SIMILAR TO THE CONSTRUCTION STAGE BUT SHOULD BE RECONSIDERED IN ADVANCE OF DECOMMISSIONING, DEMOLITION, FUTURE REFURBISHMENT OR REPLACEMENT.

Rev	Drawn	Chkd	Rvwd	Apprvd	Date	Description
P01	SPJ	MC	SPC	SPC	06/09/22	For Client Comment and Review
P02	SPJ	MC	SPC	SPC	19/12/22	Outline Design

Designed by: GLe Date: 17/02/22

Status: S5 Suitable for Client Acceptance

Client: Cyfoeth Naturiol Cymru Natural Resources Wales

Client Project No. | Revision

Binnies UK Limited
Spring Lodge, 172 Chester Road, Helsby, Cheshire, WA6 0AR, UK.
Tel: +44(0)1737 774155

Project: PANDORA RESERVOIR IMPROVEMENTS

Drawing title: LOCATION PLAN

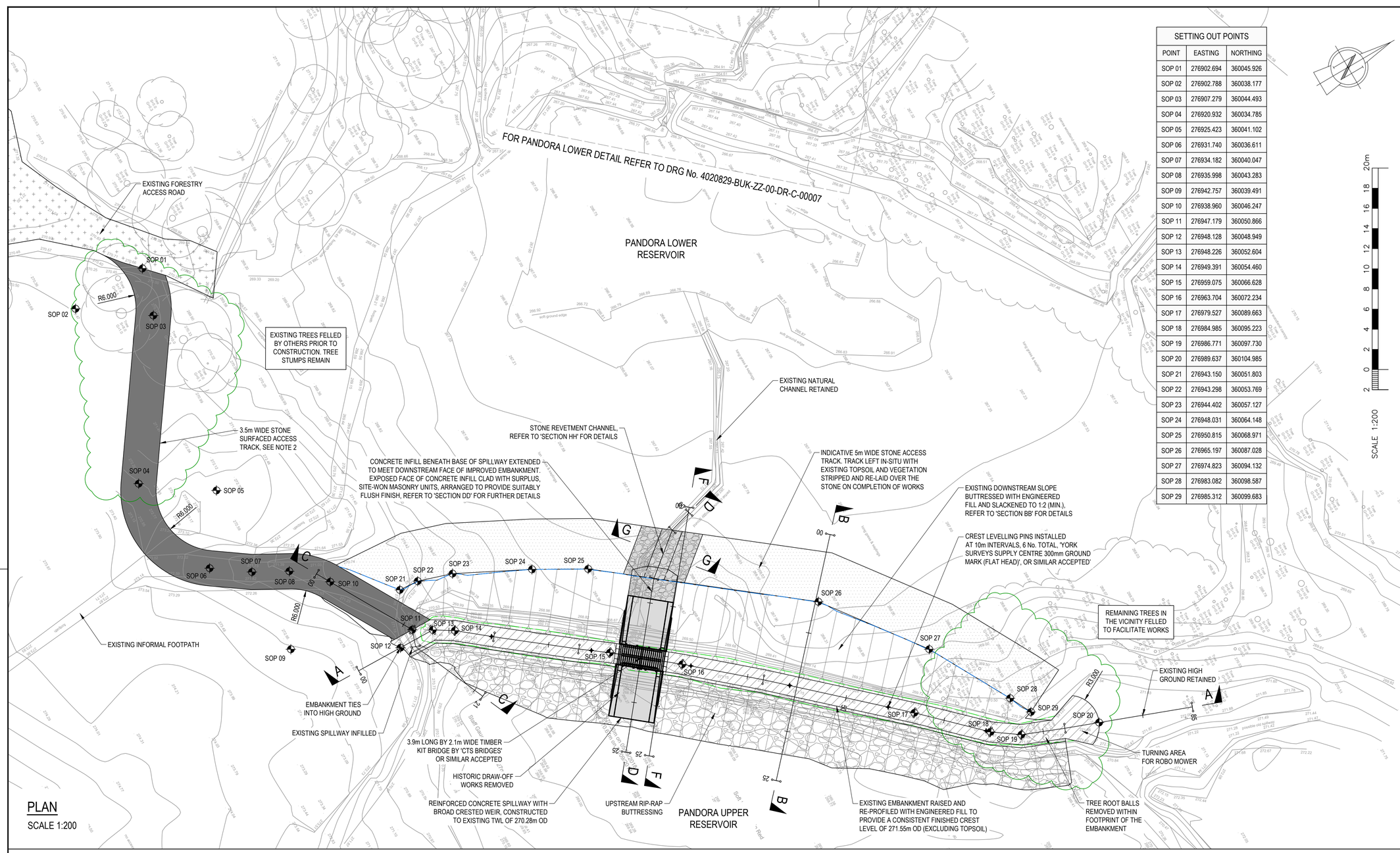
Drawing scale: AS SHOWN Sheet size: A1

Drawing no. 4020829-BUK-ZZ-00-DR-C-00002 | Revision P02

ON PROJECTWISE

FIGURE 02

Reproduction of Drawing No. 4020829-BUK-ZZ-00-DR-C-00004, General Arrangement and Long section plan.



PLAN
SCALE 1:200

SETTING OUT POINTS		
POINT	EASTING	NORTHING
SOP 01	276902.694	360045.926
SOP 02	276902.788	360038.177
SOP 03	276907.279	360044.493
SOP 04	276920.932	360034.785
SOP 05	276925.423	360041.102
SOP 06	276931.740	360036.611
SOP 07	276934.182	360040.047
SOP 08	276935.998	360043.283
SOP 09	276942.757	360039.491
SOP 10	276938.960	360046.247
SOP 11	276947.179	360050.866
SOP 12	276948.128	360048.949
SOP 13	276948.226	360052.604
SOP 14	276949.391	360054.460
SOP 15	276959.075	360066.628
SOP 16	276963.704	360072.234
SOP 17	276979.527	360089.663
SOP 18	276984.985	360095.223
SOP 19	276986.771	360097.730
SOP 20	276989.637	360104.985
SOP 21	276943.150	360051.803
SOP 22	276943.298	360053.769
SOP 23	276944.402	360057.127
SOP 24	276948.031	360064.148
SOP 25	276950.815	360068.971
SOP 26	276965.197	360087.028
SOP 27	276974.823	360094.132
SOP 28	276983.082	360098.587
SOP 29	276985.312	360099.683

Note: The limits, including the height and depths of the Works, shown in this drawing are not to be taken as limiting the obligations of the contractor under Contract.

NOTES:
1. ALL DIMENSIONS IN METRES AND ALL LEVELS IN METRES RELATIVE TO ORDNANCE DATUM (OD), UNLESS NOTED OTHERWISE.
2. ACCESS TRACK SPECIFICATION DETERMINED BY TEMPORARY WORKS DESIGN. MINIMUM REQUIREMENTS ARE 200mm DEEP CRUSHED STONE, WITH A 75mm CRUSHER RUN SURFACING COURSE. MINIMUM CROSS-SLOPE OF 5%. MINIMUM 1:2 GRADIENT SIDE SLOPES FOR THE TRACK.

GENERAL LEGEND:
- EXISTING CREST
- DOWNSTREAM TOE
- EXISTING FORESTRY ACCESS TRACK
- PERMANENT ACCESS TRACK
- CREST
- CREST LEVELLING PIN
- CONCRETE
- RECYCLED MASONRY CAST INTO CONCRETE
- TEMPORARY ACCESS TRACK

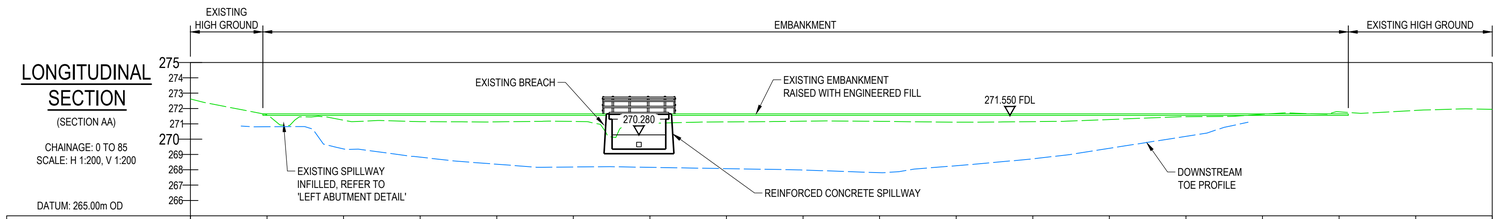
REFERENCES:

4020829-BUK-ZZ-00-DR-C-00005	SECTIONS
4020829-BUK-ZZ-00-DR-C-00006	SPILLWAY PLAN & SECTIONS
4020829-BUK-ZZ-00-DR-C-00007	PANDORA LOWER BREACH FORMALISATION PLAN AND SECTIONS

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
IN ADDITION TO THE HAZARDS OR RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, THE FOLLOWING SIGNIFICANT RESIDUAL RISKS SHOULD BE NOTED. FURTHER DETAILS ARE INCLUDED IN THE CDM DESIGN RISK MANAGEMENT REGISTER
CONSTRUCTION :
S.1 RISK OF EMBANKMENT INSTABILITY AND BREACH OF RESERVOIR. S.2 RISK OF MOBILISING CONTAMINATED SILT DURING DRAWDOWN OF THE RESERVOIR. S.3 RISK OF DAMAGING FEATURES PROTECTED BY THE SSSI ENCOMPASSING THE SITE.
MAINTENANCE, CLEANING AND OPERATION :
M.1 RISK OF FALL FROM HEIGHT AS NO EDGE PROTECTION PRESENT ALONG THE DAM CREST.
DECOMMISSIONING OR DEMOLITION :
RISKS ARE LIKELY TO BE SIMILAR TO THE CONSTRUCTION STAGE BUT SHOULD BE RECONSIDERED IN ADVANCE OF DECOMMISSIONING, DEMOLITION, FUTURE REFURBISHMENT OR REPLACEMENT.

LONGITUDINAL SECTION
(SECTION AA)

CHAINAGE: 0 TO 85
SCALE: H 1:200, V 1:200
DATUM: 265.00m OD



CHAINAGE	00.000	05.000	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000	55.000	60.000	65.000	70.000	75.000	80.000	85.000
EXISTING CREST LEVEL (CENTRELINE)	272.82	271.60	271.23	271.14	271.13	271.15	271.03	271.13	271.17	271.16	271.11	271.14	271.28	271.47	271.62	271.78	271.87	271.94
DOWNSTREAM TOE LEVEL		270.81	269.36	268.83	268.36	268.18	268.51	269.24	267.99	267.81	268.27	268.72	270.07	270.55				

Rev	Drawn	Chkd	Rvwd	Apprvd	Date	Description
P01	SPJ	MC	SPC	SPC	06/09/22	For Client Comment and Review
P02	SPJ	MC	LJM	SPC	01/12/22	Outline Design
P03	SPJ	MC	SPC	SPC	09/03/23	Detailed Design
C01	SPJ	MC	SPC	SPC	30/06/23	For Client Acceptance

Designed by: GLe Date: 01/09/22

Status
A4 Authorized Stage Complete - Technical Design (100%)

Client
Cyfoeth Naturiol Cymru Natural Resources Wales

Client Project No. | Revision

Binnies UK Limited
Spring Lodge, 172 Chester Road, Helsby, Cheshire, WA6 0AR, UK.
Tel: +44(0)1737 774155

Project
PANDORA RESERVOIR IMPROVEMENTS

Drawing title
GENERAL ARRANGEMENT AND LONG-SECTION

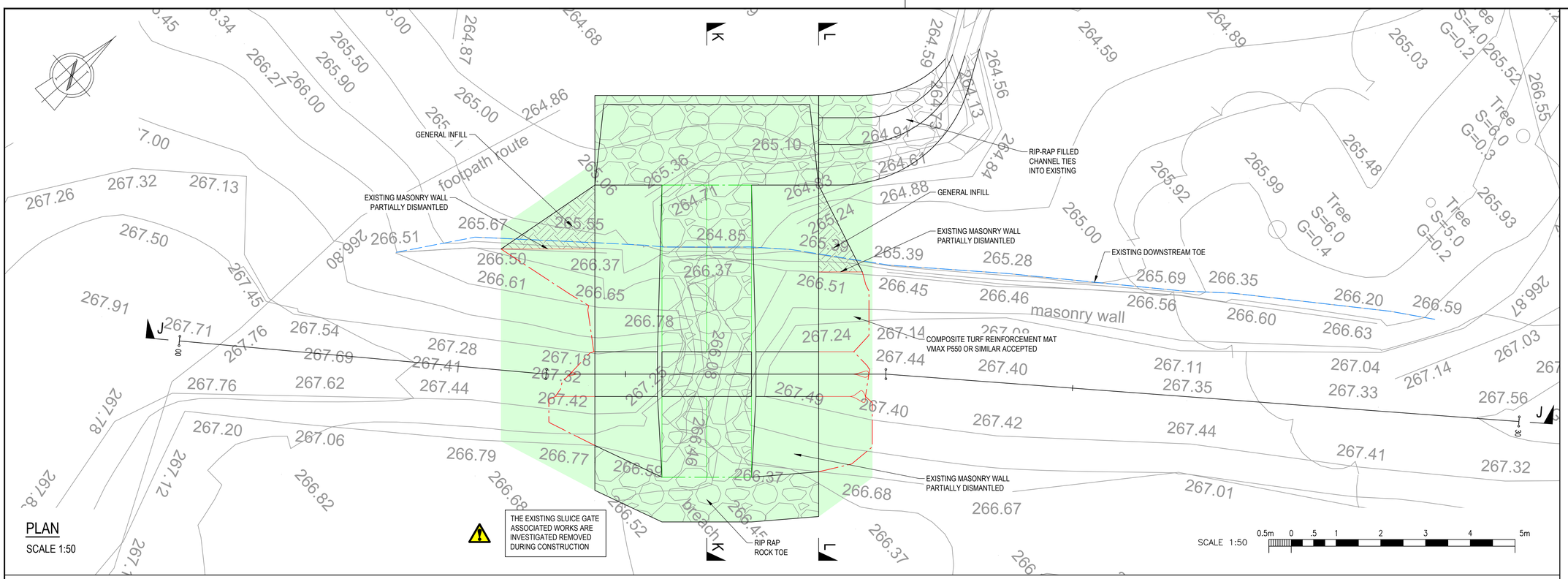
Drawing scale: 1:200 Sheet size: A1

Drawing no. 4020829-BUK-ZZ-00-DR-C-00004 | Revision C01

ON PROJECTWISE

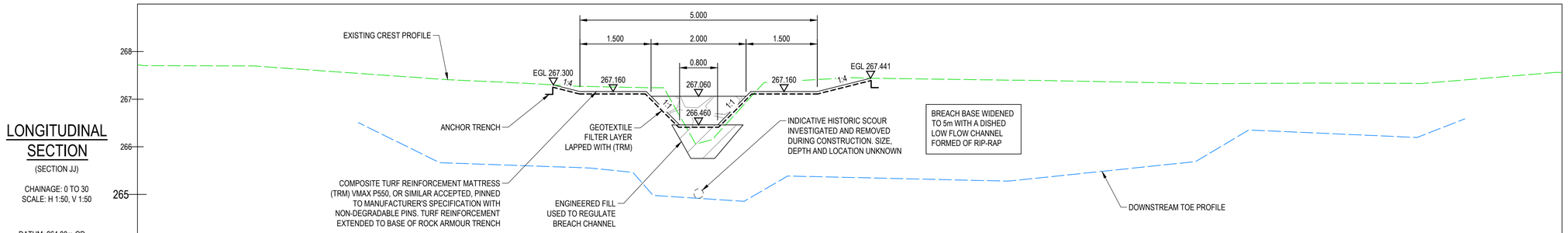
FIGURE 03

Reproduction of Drawing No. 4020829-BUK-ZZ-00-DR-C-00007, Pandora Lower Breach Formalisation Plan and Sections.



PLAN

SCALE 1:50



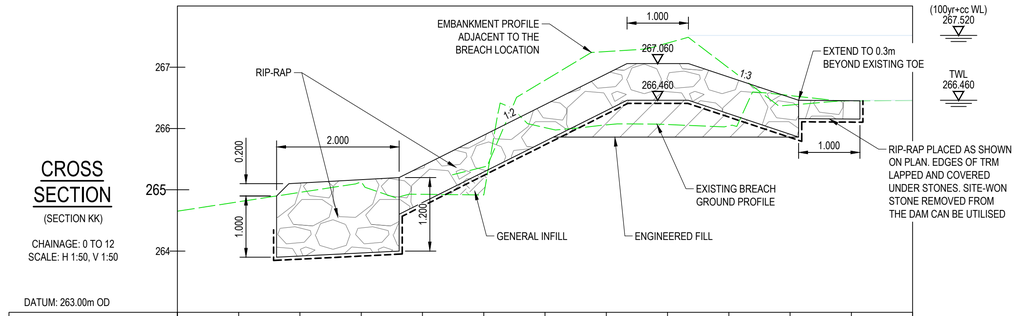
LONGITUDINAL SECTION

(SECTION JJ)

CHAINAGE: 0 TO 30
SCALE: H 1:50, V 1:50

DATUM: 264.00m OD

CHAINAGE	00.000	01.000	02.000	03.000	04.000	05.000	06.000	07.000	08.000	09.000	10.000	11.000	12.000	13.000	14.000	15.000	16.000	17.000	18.000	19.000	20.000	21.000	22.000	23.000	24.000	25.000	26.000	27.000	28.000	29.000	30.000
EXISTING CREST LEVEL (CENTRELINE)	267.72	267.70	267.70	267.66	267.59	267.52	267.45	267.39	267.34	267.29	267.26	267.24	266.12	267.14	267.40	267.45	267.43	267.42	267.40	267.39	267.37	267.36	267.34	267.33	267.33	267.34	267.33	267.33	267.41	267.49	267.56
DOWNSTREAM TOE LEVEL						266.34	265.85	265.64	265.61	265.57	265.51	264.97	264.90	264.98	265.38	265.36	265.33	265.31	265.29	265.35	265.45	265.56	265.66	266.11	266.33	266.28	266.24	266.22			



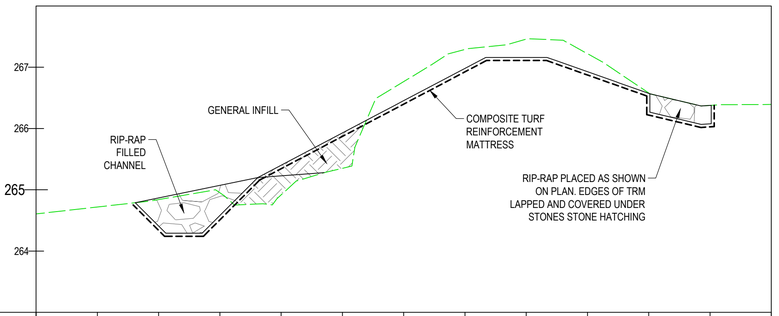
CROSS SECTION

(SECTION KK)

CHAINAGE: 0 TO 12
SCALE: H 1:50, V 1:50

DATUM: 263.00m OD

CHAINAGE	00.000	01.000	02.000	03.000	04.000	05.000	06.000	07.000	08.000	09.000	10.000	11.000	12.000
GROUND LEVEL (EXISTING)	264.65	264.80	264.96	265.13	264.93	264.92	266.02	266.06	266.07	266.04	266.54	266.45	266.46



CROSS SECTION

(SECTION LL)

CHAINAGE: 0 TO 12
SCALE: H 1:50, V 1:50

DATUM: 263.00m OD

CHAINAGE	00.000	01.000	02.000	03.000	04.000	05.000	06.000	07.000	08.000	09.000	10.000	11.000	12.000
GROUND LEVEL (EXISTING)	264.61	264.72	264.84	264.95	264.92	265.35	266.77	267.29	267.46	267.22	266.58	266.38	266.39

Note: The limits, including the height and depths of the Works, shown in this drawing are not to be taken as limiting the obligations of the contractor under Contract.

NOTES:
1. ALL DIMENSIONS IN METRES AND ALL LEVELS IN METRES RELATIVE TO ORDNANCE DATUM (OD), UNLESS NOTED OTHERWISE.

GENERAL LEGEND:

- RIP-RAP
- TURF REINFORCEMENT MAT
- EARTH INFILL
- DOWNSTREAM TOE

REFERENCES:
4020829-BUK-ZZ-00-DR-C-00002 LOCATION PLAN

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARDS OR RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, THE FOLLOWING SIGNIFICANT RESIDUAL RISKS SHOULD BE NOTED. FURTHER DETAILS ARE INCLUDED IN THE CDM DESIGN RISK MANAGEMENT REGISTER

CONSTRUCTION :

S.1 RISK OF EMBANKMENT INSTABILITY AND BREACH OF RESERVOIR.
S.3 RISK OF DAMAGING FEATURES PROTECTED BY THE SSSI ENCOMPASSING THE SITE.

MAINTENANCE, CLEANING AND OPERATION :

M.1 RISK OF FALL FROM HEIGHT AS NO EDGE PROTECTION PRESENT ALONG THE DAM CREST.

DECOMMISSIONING OR DEMOLITION :

RISKS ARE LIKELY TO BE SIMILAR TO THE CONSTRUCTION STAGE BUT SHOULD BE RECONSIDERED IN ADVANCE OF DECOMMISSIONING, DEMOLITION, FUTURE REFURBISHMENT OR REPLACEMENT.

Rev	Drawn	Chkd	Rvwd	Apprvd	Date	Description
P01	SPJ	MC	SPC	SPC	22/11/22	For Client Comment and Review
P02	SPJ	MC	SPC	SPC	09/03/23	Detailed Design
C01	SPJ	GL	SPC	SPC	07/07/23	For Construction

Designed by: GLe Date: 24/10/22

Status
A4 Authorized Stage Complete - Technical Design (100%)

Client
Cyfoeth Naturiol Cymru Natural Resources Wales

Client Project No. | Revision

Binnies UK Limited
Spring Lodge, 172 Chester Road, Helsby, Cheshire, WA6 0AR, UK.
Tel: +44(0)1737 774155

Project
PANDORA RESERVOIR IMPROVEMENTS

Drawing title
PANDORA LOWER BREACH FORMALISATION PLAN AND SECTIONS

Drawing scale: 1:50 Sheet size: A1

Drawing no. 4020829-BUK-ZZ-00-DR-C-00007 Revision C01

ON PROJECTWISE

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 Watching Brief pro-forma.

YMDDIRIEDOLAETH ARCHAEOLEGOL GWYNEDD ARCHAEOLOGICAL TRUST		
WATCHING BRIEF DAY RECORD		*Date*
Project name	*Project number*	*Compiler*
Location		
Description		
Times of travelling and on-site		
Drawn record details		
Photographic record details		

APPENDIX III

Gwynedd Archaeological Trust Selection Strategy.

G2826_Pandora_Reservoirs 16/01/2024 v1.1

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	15/01/2024
	RCAHMW	On completion of Project Archive
Project Lead / Project Assurance	Jenny Emmett Gwynedd archaeological Planning Service	15/01/2024
Landowner / Developer	NRW/BINNIES UK Ltd	11/01/2024
Other	n/a	n/a

Resources

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

Context

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 BINNIES UK Ltd on behalf of to conduct an archaeological watching brief of groundworks to improve the upper embankment adjacent to Pandora Upper Reservoir (centred on NGR SH76966007; postcode LL27 0YX; Figure 01). The site consists of two reservoirs, Pandora Upper and Lower, with the upper being the western of the two, and is accessed via a number of unclassified roads off the B5106, forestry tracks extend to the southwestern corner of the site. Approximately 160m to the west of the site, beyond a wooded area, lies the former Pandora mine site, which the reservoirs were built to serve as a water retention and water source.

The groundworks are in relation to improving the upper embankment located between Pandora Upper and Pandora Lower reservoirs (Figure 02). The groundworks comprise of (but are not limited to):

1) Stone access track (5m wide) along the western side of the upper embankment.
2) Trees in the vicinity of the upper embankment to be felled.
3) Tree root balls removed within footprint of the embankment.
4) The existing spillway infilled.
5) The insertion of a new reinforced concrete spillway through the upper embankment at the location of a breach.
6) The new spillway will extend roughly northwest toward the Pandora Lower Reservoir and link in with an existing natural channel.
7) The remainder of the embankment will be re-profiled, buttressed and raised.
8) A new timber bridge will be placed across the width of the new spillway

The groundworks commenced in December 2023 with actions 1) to 3) being undertaken and completed in the absence of an archaeologist.

Gwynedd Archaeological Trust. 2024. Pandora Reservoirs: *Written Scheme of Investigation.* Project G2826.

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 was collected and stored in line with the Gwynedd Archaeological Trust (GAT) Data Management Plan located on GAT's servers (available on request).

The selection strategy in your DMP should:

1.1 Define what digital data was selected for inclusion in the archaeological archive, how this was done, and why. Do not forget to consider that specialists may have digital data that should be included in the archaeological archive.
1.2 Identify the selection review points during the project (i.e. project planning, data gathering, analysis and reporting and archive compilation).
1.3 Reference all relevant standards, policies or guidelines (e.g. digital repository deposition requirements) and specialist advice sought.
1.4 Identify any selection decisions that differ from standard guidelines and explain why.

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. 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.

The physical paper 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 will be provided to the regional HER and RCAHMW within six months of project completion.
Archiving was undertaken in accordance with the following standards and guidance:

- *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);

- *Standard and guidance for the collection, documentation, conservation and research of archaeological materials* (Chartered Institute for Archaeologists, 2020); and
- *Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives* (Chartered Institute for Archaeologists, 2020).

A selection review point will be completed during processing of the working project archive and again during final project archiving. There are no selection decisions that differ from standard guidelines.

De-Selected Digital Data

The procedure for dealing with De-selected digital data and what specialist advice informed this process should be recorded in your DMP. Please copy this information here or attach your DMP as an appendix to this document.

There is no de-selected digital 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

Describe your Selection Strategy for the Documents elements of the archaeological archive. To do this you must:

2.1 Define which documents was selected for inclusion in the archaeological archive, how this was done, and why. Do not forget to consider that specialists may have documents that should be included in the archaeological archive.
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. digital repository deposition requirements) and specialist advice sought.
2.4 Identify any selection decisions that differ from standard guidelines and explain why.

- 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).

De-Selected Documents

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

Material de-selected from inclusion in the preserved archive are likely to be duplicates and reproductions created during the project. De-selected material was retained to supplement GAT's research files or recycled.

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	None	**Section 3.**	

Stakeholders

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

Selection

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

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

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

Uncollected Material

If you are practising selection in the field, describe the process that was 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.

None

De-Selected Material

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

N/A

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

APPENDIX II

Reproduction of Heneb Gwynedd Archaeology Photographic Metadata.

PHOTO RECORD NUMBER	PROJECT NAME	DESCRIPTION*	VIEW FROM	SCALE(S)	REASON FOR PHOTO*	CREATOR OF DIGITAL PHOTO*	DATE OF CREATION OF DIGITAL PHOTO*	ORIGINATING ORGANISATION	PLATES
G2826_001	Pandora Reservoir	View of exposed mouth of sluice within west face of embankment	WNW	1x2m and 1x1m	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_002	Pandora Reservoir	Close-up view of west face of sluice opening	WNW	1x1m	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	14
G2826_003	Pandora Reservoir	Close-up of interior of sluice opening	W	1x1m	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	15
G2826_004	Pandora Reservoir	Close-up of interior of sluice opening	W	1x1m	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_005	Pandora Reservoir	Location of breach and sluice opening in embankment	SW	1x2m	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	16
G2826_006	Pandora Reservoir	Location of breach and sluice opening in embankment	NE	1x2m	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_007	Pandora Reservoir	Location of breach with blue line markings for spillway dig	NE	1x2m	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_008	Pandora Reservoir	Western face of embankment before excavation	SW	1x2m	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_009	Pandora Reservoir	View of contractor's trackway adjacent to embankment	SW	1x2m	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_010	Pandora Reservoir	View of upper embankment and work area from access track	W	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	01

PHOTO RECORD NUMBER	PROJECT NAME	DESCRIPTION*	VIEW FROM	SCALE(S)	REASON FOR PHOTO*	CREATOR OF DIGITAL PHOTO*	DATE OF CREATION OF DIGITAL PHOTO*	ORIGINATING ORGANISATION	PLATES
G2826_011	Pandora Reservoir	Excavation of spillway break of embankment wall	NNE	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	17
G2826_012	Pandora Reservoir	View of breach of embankment wall	NNE	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_013	Pandora Reservoir	View of breach of embankment wall	NNE	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_014	Pandora Reservoir	View of interior of embankment exposed	WNW	1x2m	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_015	Pandora Reservoir	Western face of embankment at north side of bread, set on bedrock	WNW	1x2m	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_016	Pandora Reservoir	Location view of embankment wall set on bedrock	WSW	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	12
G2826_017	Pandora Reservoir	View of earth core of embankment exposed	WSW	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_018	Pandora Reservoir	View of earth core of embankment exposed	SSW	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	18
G2826_019	Pandora Reservoir	Excavation of spillway through embankment	SSW	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_020	Pandora Reservoir	Excavation of spillway through embankment	SSW	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	19
G2826_021	Pandora Reservoir	Excavation of spillway through embankment	SSW	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_022	Pandora Reservoir	Excavation of spillway through embankment	SSW	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	

PHOTO RECORD NUMBER	PROJECT NAME	DESCRIPTION*	VIEW FROM	SCALE(S)	REASON FOR PHOTO*	CREATOR OF DIGITAL PHOTO*	DATE OF CREATION OF DIGITAL PHOTO*	ORIGINATING ORGANISATION	PLATES
G2826_023	Pandora Reservoir	Location of existing spillway (water pump pipes)		1x2m and 1x1m	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_024	Pandora Reservoir	Location of existing spillway (water pump pipes)		1x2m and 1x1m	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_025	Pandora Reservoir	Partially exposed southeast corner of embankment for spillway	SE	1x1m	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_026	Pandora Reservoir	View of reservoir, coffer dam and embankment excavation	S	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_027	Pandora Reservoir	View of embankment excavation at east face of wall	S	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	20
G2826_028	Pandora Reservoir	Removal of silt within coffer dam/reservoir	WSW	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_029	Pandora Reservoir	View of track access/work area for spillway excavation	SSE	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_030	Pandora Reservoir	View of lower reservoir and embankment	SSE	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_031	Pandora Reservoir	Southern terminal, west face of embankment	W	1x2m and 1x1m	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_032	Pandora Reservoir	Western face of embankment with ledge	W	1x2m and 1x1m	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	11

PHOTO RECORD NUMBER	PROJECT NAME	DESCRIPTION*	VIEW FROM	SCALE(S)	REASON FOR PHOTO*	CREATOR OF DIGITAL PHOTO*	DATE OF CREATION OF DIGITAL PHOTO*	ORIGINATING ORGANISATION	PLATES
G2826_033	Pandora Reservoir	Northern section of west face of embankment	NNE	1x2m	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_034	Pandora Reservoir	Exposed bedrock adjacent to embankment	NE	1x2m	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_035	Pandora Reservoir	Northern terminal of west face of embankment set on bedrock	SW	1x1m	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_036	Pandora Reservoir	View of north area next to embankment	NE	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	02
G2826_037	Pandora Reservoir	View of lower reservoir	E	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_038	Pandora Reservoir	Peat/vegetation clearance bund for trackway access	E	1x2m	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	03
G2826_039	Pandora Reservoir	View of lower reservoir and breach in lower embankment	SE	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_040	Pandora Reservoir	East face of embankment being exposed as silty is removal and visible timbers	SW	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	
G2826_041	Pandora Reservoir	Excavation area of spillway within embankment and coffer dam	SW	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	21
G2826_042	Pandora Reservoir	Southwest face of profile through embankment during excavation	SW	Not used	Watching Brief	Stuart Reilly	17/01/2024	Heneb Gwynedd	22

PHOTO RECORD NUMBER	PROJECT NAME	DESCRIPTION*	VIEW FROM	SCALE(S)	REASON FOR PHOTO*	CREATOR OF DIGITAL PHOTO*	DATE OF CREATION OF DIGITAL PHOTO*	ORIGINATING ORGANISATION	PLATES
G2826_043	Pandora Reservoir	Level of silt in coffer dam	SW	Not used	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	
G2826_044	Pandora Reservoir	Steel coffer dam in place within spillway dig	SW	Not used	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	23
G2826_045	Pandora Reservoir	View of excavation for new spillway through embankment	N	Not used	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	24
G2826_046	Pandora Reservoir	Section of embankment façade built on bedrock, next to excavation area	NW	Not used	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	
G2826_047	Pandora Reservoir	Exposed bedrock along northwest side of upper embankment	NNE	Not used	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	04
G2826_048	Pandora Reservoir	Work area with access track and lower reservoir visible	NE	Not used	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	05
G2826_049	Pandora Reservoir	View of silted up, de-watered upper reservoir	W	Not used	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	06
G2826_050	Pandora Reservoir	Spillway excavation through embankment, with coffer dam	NNW	Not used	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	
G2826_051	Pandora Reservoir	Northwest façade of embankment set on mixture of clay and bedrock	NW	1x1m	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	
G2826_052	Pandora Reservoir	Northern end of embankment with bedrock in foreground	W	1x1m	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	13

PHOTO RECORD NUMBER	PROJECT NAME	DESCRIPTION*	VIEW FROM	SCALE(S)	REASON FOR PHOTO*	CREATOR OF DIGITAL PHOTO*	DATE OF CREATION OF DIGITAL PHOTO*	ORIGINATING ORGANISATION	PLATES
G2826_053	Pandora Reservoir	View along length of northwest façade of lower embankment	N	1x1m	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	33
G2826_054	Pandora Reservoir	Face of stone wall façade lower embankment	NW	1x1m	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	34
G2826_055	Pandora Reservoir	Oblique view of lower embankment stone façade	W	1x1m	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	
G2826_056	Pandora Reservoir	Breach through lower embankment	NNE	1x1m	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	
G2826_057	Pandora Reservoir	Silted lower reservoir with site works in background	W	Not used	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	07
G2826_058	Pandora Reservoir	Tarpaulin covered bread through lower embankment	NNE	Not used	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	08
G2826_059	Pandora Reservoir	Western face of lower embankment	NNE	Not used	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	09
G2826_060	Pandora Reservoir	Eastern face of lower embankment	ENE	Not used	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	10
G2826_061	Pandora Reservoir	Slipway excavation, with exposed natural clay visible	SW	Not used	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	25
G2826_062	Pandora Reservoir	Southwest face of embankment within spillway excavation	SW	Not used	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	26
G2826_063	Pandora Reservoir	Close-up view of reservoir silt beneath gravel bags at coffer dam	W	Not used	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	

PHOTO RECORD NUMBER	PROJECT NAME	DESCRIPTION*	VIEW FROM	SCALE(S)	REASON FOR PHOTO*	CREATOR OF DIGITAL PHOTO*	DATE OF CREATION OF DIGITAL PHOTO*	ORIGINATING ORGANISATION	PLATES
G2826_064	Pandora Reservoir	Spillway excavation base after concrete pour	SW	Not used	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	
G2826_065	Pandora Reservoir	Close-up view of southwest face of embankment	SW	Not used	Watching Brief	Stuart Reilly	26/01/2024	Heneb Gwynedd	
G2826_066	Pandora Reservoir	Pre-excavation of lower embankment	SW	1x1m	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	35
G2826_067	Pandora Reservoir	Bog mats and preparation for excavation	S	Not used	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	36
G2826_068	Pandora Reservoir	General view of upper embankment	W	Not used	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	27
G2826_069	Pandora Reservoir	View along top of upper embankment, with clay, rip rap and bridge	SW	Not used	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	
G2826_070	Pandora Reservoir	View of upper embankment and reservoir	SSW	Not used	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	28
G2826_071	Pandora Reservoir	Completed spillway and bridge inserted within upper embankment	SW	Not used	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	29
G2826_072	Pandora Reservoir	Completed spillway face-on within embankment	WNW	Not used	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	30
G2826_073	Pandora Reservoir	Imported clay over original embankment and next to spillway	W	Not used	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	31
G2826_074	Pandora Reservoir	Work area next to upper embankment	NE	Not used	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	
G2826_075	Pandora Reservoir	View of upper embankment	NE	Not used	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	32

PHOTO RECORD NUMBER	PROJECT NAME	DESCRIPTION*	VIEW FROM	SCALE(S)	REASON FOR PHOTO*	CREATOR OF DIGITAL PHOTO*	DATE OF CREATION OF DIGITAL PHOTO*	ORIGINATING ORGANISATION	PLATES
G2826_076	Pandora Reservoir	Lower embankment being de-turfed	NE	Not used	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	
G2826_077	Pandora Reservoir	Lower embankment being de-turfed	NE	Not used	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	37
G2826_078	Pandora Reservoir	General view of upper and lower Pandora site	SSE	Not used	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	
G2826_079	Pandora Reservoir	Make up of lower embankment after de-turf	NE	Not used	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	
G2826_080	Pandora Reservoir	Make up of lower embankment after de-turf	NE	Not used	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	
G2826_081	Pandora Reservoir	Removal of timbers of existing penstock	NE	Not used	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	
G2826_082	Pandora Reservoir	Removal of turf along lower embankment	NE	Not used	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	
G2826_083	Pandora Reservoir	Area de-turfed either side of breach through lower embankment	NE	Not used	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	
G2826_084	Pandora Reservoir	Southeast stone façade of the lower embankment	NW	1x1m	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	
G2826_085	Pandora Reservoir	Area de-turfed next to breach	NE	1x1m	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	38
G2826_086	Pandora Reservoir	Area de-turfed next to breach	SW	1x1m	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	39
G2826_087	Pandora Reservoir	Southeast stone façade of the lower embankment	NW	1x1m	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	40
G2826_088	Pandora Reservoir	Southeast stone façade of the lower embankment	S	1x1m	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	41

PHOTO RECORD NUMBER	PROJECT NAME	DESCRIPTION*	VIEW FROM	SCALE(S)	REASON FOR PHOTO*	CREATOR OF DIGITAL PHOTO*	DATE OF CREATION OF DIGITAL PHOTO*	ORIGINATING ORGANISATION	PLATES
G2826_089	Pandora Reservoir	View of breach and area de-turfed along lower embankment	S	1x1m	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	
G2826_090	Pandora Reservoir	Timbers that formed the penstock	S	1x1m	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	43
G2826_091	Pandora Reservoir	Timbers that formed the penstock	N	1x1m	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	
G2826_092	Pandora Reservoir	View of penstock paddle and metal rod	S	1x1m	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	
G2826_093	Pandora Reservoir	Penstock paddle and metal rod	S	1x1m	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	44
G2826_094	Pandora Reservoir	Penstock paddle and metal rod	S	1x1m	Watching Brief	Stuart Reilly	15/03/2024	Heneb Gwynedd	45
G2826_095	Pandora Reservoir	Northwest face of lower embankment after removal of tarpaulin	NW	Not used	Watching Brief	Stuart Reilly	18/03/2024	Heneb Gwynedd	
G2826_096	Pandora Reservoir	Widening of breach using excavator	NNE	Not used	Watching Brief	Stuart Reilly	18/03/2024	Heneb Gwynedd	
G2826_097	Pandora Reservoir	Widened breach through embankment	NE	1x1m	Watching Brief	Stuart Reilly	18/03/2024	Heneb Gwynedd	
G2826_098	Pandora Reservoir	Widened breach through embankment	NE	1x1m	Watching Brief	Stuart Reilly	18/03/2024	Heneb Gwynedd	
G2826_099	Pandora Reservoir	Pre-excavation view of area below embankment	NE	Not used	Watching Brief	Stuart Reilly	18/03/2024	Heneb Gwynedd	
G2826_100	Pandora Reservoir	Excavation below lower embankment	E	Not used	Watching Brief	Stuart Reilly	18/03/2024	Heneb Gwynedd	
G2826_101	Pandora Reservoir	Excavation below lower embankment	E	Not used	Watching Brief	Stuart Reilly	18/03/2024	Heneb Gwynedd	

PHOTO RECORD NUMBER	PROJECT NAME	DESCRIPTION*	VIEW FROM	SCALE(S)	REASON FOR PHOTO*	CREATOR OF DIGITAL PHOTO*	DATE OF CREATION OF DIGITAL PHOTO*	ORIGINATING ORGANISATION	PLATES
G2826_102	Pandora Reservoir	Excavation below lower embankment	NE	Not used	Watching Brief	Stuart Reilly	18/03/2024	Heneb Gwynedd	
G2826_103	Pandora Reservoir	Excavation below lower embankment	NE	Not used	Watching Brief	Stuart Reilly	18/03/2024	Heneb Gwynedd	46
G2826_104	Pandora Reservoir	Excavation of channel below the lower embankment	E	Not used	Watching Brief	Stuart Reilly	18/03/2024	Heneb Gwynedd	
G2826_105	Pandora Reservoir	Northwest face stone façade of lower embankment	NW	1x1m	Watching Brief	Stuart Reilly	18/03/2024	Heneb Gwynedd	42
G2826_106	Pandora Reservoir	View of area excavated below lower embankment	NE	Not used	Watching Brief	Stuart Reilly	18/03/2024	Heneb Gwynedd	47
G2826_107	Pandora Reservoir	Northwest face of embankment with stones removed and view of breach	NW	Not used	Watching Brief	Stuart Reilly	18/03/2024	Heneb Gwynedd	
G2826_108	Pandora Reservoir	Post completion view of upper embankment	W	Not used	Watching Brief	Stuart Reilly	17/05/2024	Heneb Gwynedd	
G2826_109	Pandora Reservoir	Post completion view of lower reservoir and embankment	S	Not used	Watching Brief	Stuart Reilly	17/05/2024	Heneb Gwynedd	
G2826_110	Pandora Reservoir	Post completion view of upper embankment, spillway and bridge	WSW	Not used	Watching Brief	Stuart Reilly	17/05/2024	Heneb Gwynedd	49
G2826_111	Pandora Reservoir	Post completion view of spillway at upper embankment	WNW	1x1m	Watching Brief	Stuart Reilly	17/05/2024	Heneb Gwynedd	50

PHOTO RECORD NUMBER	PROJECT NAME	DESCRIPTION*	VIEW FROM	SCALE(S)	REASON FOR PHOTO*	CREATOR OF DIGITAL PHOTO*	DATE OF CREATION OF DIGITAL PHOTO*	ORIGINATING ORGANISATION	PLATES
G2826_112	Pandora Reservoir	Post completion view of spillway and bridge at upper embankment	W	1x1m	Watching Brief	Stuart Reilly	17/05/2024	Heneb Gwynedd	
G2826_113	Pandora Reservoir	Post completion view of top of upper embankment and reservoir	SW	Not used	Watching Brief	Stuart Reilly	17/05/2024	Heneb Gwynedd	
G2826_114	Pandora Reservoir	Post completion view of lower reservoir and embankment with spillway in foreground	SE	Not used	Watching Brief	Stuart Reilly	17/05/2024	Heneb Gwynedd	
G2826_115	Pandora Reservoir	New foot bridge and pen stock at upper embankment	NNE	1x1m	Watching Brief	Stuart Reilly	17/05/2024	Heneb Gwynedd	51
G2826_116	Pandora Reservoir	Post completion view of upper reservoir and embankment	N	Not used	Watching Brief	Stuart Reilly	17/05/2024	Heneb Gwynedd	52
G2826_117	Pandora Reservoir	Post completion view of former work area and lower reservoir	NE	Not used	Watching Brief	Stuart Reilly	17/05/2024	Heneb Gwynedd	48
G2826_118	Pandora Reservoir	Post completion view of lower embankment	NNE	Not used	Watching Brief	Stuart Reilly	17/05/2024	Heneb Gwynedd	
G2826_119	Pandora Reservoir	Consolidation of breach in lower embankment with terram and stone	NE	1x1m	Watching Brief	Stuart Reilly	17/05/2024	Heneb Gwynedd	
G2826_120	Pandora Reservoir	Pandora lower reservoir	NW	Not used	Watching Brief	Stuart Reilly	17/05/2024	Heneb Gwynedd	

PHOTO RECORD NUMBER	PROJECT NAME	DESCRIPTION*	VIEW FROM	SCALE(S)	REASON FOR PHOTO*	CREATOR OF DIGITAL PHOTO*	DATE OF CREATION OF DIGITAL PHOTO*	ORIGINATING ORGANISATION	PLATES
G2826_121	Pandora Reservoir	Post completion view of lower embankment and breach	SW	Not used	Watching Brief	Stuart Reilly	17/05/2024	Heneb Gwynedd	53

APPENDIX III

Reproduction of Heneb Gwynedd Archaeology Selection Strategy.

G2826_Pandora_Reservoirs 13/06/2024 v2.0

Selection Strategy

Project Information

Project Management

Project Manager	John Roberts john.roberts @heneb.co.uk	
Archaeological Archive Manager	John Roberts john.roberts @heneb.co.uk	
Organisation	Heneb Gwynedd Archaeology	
Stakeholders		**Date Contacted**
Collecting Institution(s)	Gwynedd Historic Environment Record	15/01/2024
	RCAHMW	On completion of Project Archive
Project Lead / Project Assurance	Jenny Emmett Gwynedd archaeological Planning Service	15/01/2024
Landowner / Developer	NRW/BINNIES UK Ltd	11/01/2024
Other	n/a	n/a

Resources

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

Context

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.

Heneb: Gwynedd Archaeology (formerly known as Gwynedd Archaeological Trust) was contracted by BINNIES UK Ltd on behalf of NRW to undertake an archaeological watching brief of groundworks to improve the upper embankment of Pandora Upper Reservoir and lower embankment Pandora Lower Reservoir (centred on NGR SH76966007; postcode LL27 0YX; Figure 01). The site consists of two reservoirs, Pandora Upper and Lower, with the upper being the western of the two, and is accessed via a number of unclassified roads off the B5106, forestry tracks extend to the southwestern corner of the site. Approximately 160m to the west of the site, beyond a wooded area, lies the former Pandora mine site, which the reservoirs were built to serve as a water retention and water source.

The archaeological mitigation was defined in consultation with BINNIES UK Limited and Heneb: Gwynedd Archaeology Planning (formerly Gwynedd Archaeological Planning Service), are in relation to improving the upper embankment located between Pandora Upper and Pandora Lower reservoirs (Figure 02). The archaeological watching brief incorporated the following:

1) Record of the exposed upper embankment of Pandora Upper Reservoir.
2) The excavation at the location of the breach of the upper embankment of Pandora Upper Reservoir for the new reinforced concrete spillway.
3) Groundworks associated with the formalisation of the breach of the lower embankment Pandora Lower Reservoir.
4) Record of changes to the upper embankment of Pandora Upper Reservoir, such as, the re-profile of the embankment, the new reinforced concrete spillway and the new timber bridge across the width of the new spillway.

The archaeological watching brief was undertaken between January & March 2024, with a final post-completion visit in May 2024.

Heneb: Gwynedd Archaeology. 2024. Pandora Reservoirs: *Written Scheme of Investigation.* Project HD24-021 / G2826.

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 was collected and stored in line with the Gwynedd Archaeological Trust (GAT) Data Management Plan located on GAT's servers (available on request).

The selection strategy in your DMP should:

1.1 Define what digital data was selected for inclusion in the archaeological archive, how this was done, and why. Do not forget to consider that specialists may have digital data that should be included in the archaeological archive.
1.2 Identify the selection review points during the project (i.e. project planning, data gathering, analysis and reporting and archive compilation).
1.3 Reference all relevant standards, policies or guidelines (e.g. digital repository deposition requirements) and specialist advice sought.
1.4 Identify any selection decisions that differ from standard guidelines and explain why.

All digital data was collected and stored in line with Heneb: Gwynedd Archaeology's Data Management Plan located on Gwynedd Archaeology's servers (available on request).

The final version of all digital documents have been selected for inclusion in the Preserved Archive; these comprise:

- HD24-021/G2826 Method Statement for Archaeological Mitigation (Microsoft WORD and Adobe PDF);
- HD24-021/G2826 Photographic Metadata (Microsoft Access);
- Report 1776 (Microsoft WORD and Adobe PDF);
- Photographic archive (121 images in TIFF format);
- Photographic archive (121 images in RAW format);
- Photographic archive (121 images in JPEG format).

A digital archive dataset has been created for the Royal Commission on Ancient and Historic Monuments Wales, in accordance with the RCAHMW Guidelines for Digital Archives Version 1. The dataset has been prepared in the format required by RCAHMW and comprise:
• Photographic metadata (Microsoft Access);
• 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). The digital archive has been stored on a dedicated Trust server, with the location confirmed in the Heneb: Gwynedd Archaeology's project database via a specific hyperlink. All digital data has been collected, stored and selected in lines with the Heneb: Gwynedd Archaeology's Data Management Plan located on Heneb: Gwynedd Archaeology's servers.

De-Selected Digital Data

The procedure for dealing with De-selected digital data and what specialist advice informed this process should be recorded in your DMP. Please copy this information here or attach your DMP as an appendix to this document.

The following client data will not form part of the preserved archive and have been deselected:

- HD24-021 / G2826 archaeological mitigation areas maps supplied by client.

The following Heneb Gwynedd Archaeology data generated for the report will not form part of the preserved archive and have been deselected:

- G2826_combined_figures.pdf
- G2826_combined_plates.pdf
- G2826_Figures_and_Plates_List.docx
- G2826_Appendix_I.pdf
- G2826_Appendix_II.docx
- G2826_Appendix_III.pdf
- G2826_front_cover.pdf
- G2826_inner_cover.pdf
- G2826_rear_cover.pdf
- Plates01 - 02.pdf
- Plates03 - 04.pdf
- Plates05 - 06.pdf
- Plates07 - 08.pdf
- Plates09 - 10.pdf
- Plates11 - 12.pdf
- Plates13 -14.pdf
- Plates15 - 16.pdf
- Plates17 - 18.pdf
- Plates 19 – 20.pdf
- Plates 21 – 22.pdf
- Plates 23 - 24.pdf
- Plates 25 - 26.pdf
- Plates 27 – 28.pdf
- Plates 29 – 30.pdf
- Plates 31 – 32.pdf
- Plates 33 -34.pdf
- Plates 35 – 36.pdf
- Plates 37 – 38.pdf
- Plates 39 – 40.pdf
- Plates 41 – 42.pdf
- Plates 43 – 44.pdf
- Plates 45 – 46.pdf
- Plates 47 – 48.pdf
- Plates 49 – 50.pdf
- Plates 51 – 52.pdf
- Plate 53.pdf

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, Heneb: Gwynedd Archaeology;
Sean Derby – Historic Environment Record, Heneb: Gwynedd Archaeology;
Gareth Edwards, *Head of Knowledge and Understanding, RCAHMW*

Selection

Describe your Selection Strategy for the Documents elements of the archaeological archive. To do this you must:

2.1 Define which documents was selected for inclusion in the archaeological archive, how this was done, and why. Do not forget to consider that specialists may have documents that should be included in the archaeological archive.
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. digital repository deposition requirements) and specialist advice sought.
2.4 Identify any selection decisions that differ from standard guidelines and explain why.

A digital report will be provided to the regional Historic Environment Record, 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 2.1); and A digital report and digital archive dataset will be provided to Royal Commission on Ancient and Historic Monuments, Wales (final report only), in accordance with the RCAHMW Guidelines for Digital Archives Version 1. The dataset was prepared in the format required by RCAHMW and included:

- Photographic metadata (Microsoft Access);
- 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).

Following the completion of the fieldwork, all documentary material created, generated and/or annotated during data gathering and fieldwork has been selected for inclusion in the preserved archive, and comprises:

- G2826 watching brief day sheets x 4
- G2826 photographic register sheets x 13
- G2826 basic record forms x 4
- G2826 elevation sketch of sluice

The physical archive has been stored in a designated project folder and the location confirmed in the Heneb: Gwynedd Archaeology project database.

De-Selected Documents

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

Material de-selected from inclusion in the preserved archive are likely to be duplicates and reproductions created during the project. De-selected material was retained to supplement Heneb: Gwynedd Archaeology’s research files or recycled.

Archaeoleg Gwynedd
Heneb
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