1360

DCWW Dinorwig Wastewater Treatment Works

Archaeological Watching Brief

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

DCWW Dinorwig
Wastewater Treatment Works

Archaeological Watching Brief

Prosiect Rhif / Project No. G2492

Adroddiad Rhif / Report No.1360

Prepared for: Waterco Ltd

February 2017

Written by: Rob Evans & John Roberts

***front cover image: General shot of ground investigation works as viewed from the north (G2492_030)**

Cyhoeddwyd gan Ymddiriedolaeth Achaeolegol Gwynedd
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Published by Gwynedd Archaeological Trust
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Approvals Table				
	Role	Printed Name	Signature	Date
Originated by	Document Author	JOHN ROBERTS		23/02/17
Reviewed by	Document Reviewer	ROBERT EVANS		23/02/17
Approved by	Principal Archaeologist	JOHN ROBERTS		23/02/17

Revision History			
Rev No.	Summary of Changes	Ref Section	Purpose of Issue
1	Inclusion of geological and topographic description as part of the background section	3.1	GAPS approval
1	Historic Environment Record Primary Reference Numbers included in background section	3.2	GAPS approval
1	Inclusion of a figure denoting Historic Environment Record Primary Reference Numbers included in background section	Figure 01	GAPS approval

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1 NON TECHNICAL SUMMARY

Gwynedd Archaeological Trust was commissioned by Waterco Ltd to undertake an archaeological watching brief during geotechnical ground investigation works for a proposed wastewater treatment works at Dinorwig, Gwynedd. The watching brief monitored three trial holes located at the southern end of an irregular shaped semi-improved field. The content of the three trial holes was limited to shallow topsoil sealing the glacial horizon. The shallow topsoil and lack of subsequent subsoils suggested the field had not been cultivated but was used as pasture. No archaeological activity, artefacts or organic deposits were identified within the confines of the trial holes.

2 INTRODUCTION

Gwynedd Archaeological Trust (GAT) was commissioned by *Waterco Ltd* to undertake an archaeological watching brief during geotechnical ground investigation works (GI) for a proposed wastewater treatment works (WWTW) at Dinorwig, Gwynedd (NGR SH58746145; Figure 01).

The proposed WWTW area measures 1010m^2 and is located within a large irregular shaped field close to Capel Dinorwig. The scheme is located within the area specified in DCWW Drawing No. w2281-9005-L04 (Figure 04) and the specific design of the WWTW is detailed in DCWW Drawing No. w2281-9205-A00 (Figure 05) and w2281-9206-A00 (Figure 06).

The WWTW will encompass an area c.20m wide by c.20m long, with the infrastructure located in an area c.15m wide and c.18m long. The infrastructure will be set within a reduced area and comprise the following:

- a retaining wall;
- a concrete internal access road;
- an internal access road an olive green biodisc treatment plant;
- a sample chamber;
- a dark green 1.6m high control kiosk; and
- a dark green 1.51m high wash water kiosk.

A timber stock proof fence will enclose the WWTW area within the existing field. Site access will be from an existing local road, which will be improved, with the existing hardcore track resurfaced with tarmac. The northern boundary wall for the road will be breached to accommodate an entrance into the WWTW, rebuilt using existing stone, as will designated lengths of the road boundary wall. The existing internal field boundary wall will not be modified. As specified on DCWW Drawing No. w2281-9205-A00 (Figure 08) and w2281-9206-A00 (Figure 09) the construction of the WWTW will involve the reduction of the existing sloping ground level. Elevations B, C and D on DCWW Drawing No. w2281-9206-A00 (Figure 09) indicate a ground reduction of over 2.5m at the deepest point, resulting in the WWTW sitting in a hollow.

The watching brief monitored the GI locations as detailed in DCWW Drawing No. w2281-TH (Figure 02). The GI was completed on 01/02/2017 and included three trial holes based on the following dimensions:

- Trial Hole No.1 - depth 5.0m; location: NGR SH58776143;
- Trial Hole No.2 - depth 2.5m; location: NGR SH58786140; and
- Trial Hole No.3 - depth 2.5m; location: NGR SH58786143.

The watching brief was monitored by the Gwynedd Archaeological Planning Services (GAPS). GAT prepared a project design in advance of fieldwork that was submitted to GAPS for approval (Appendix II).

The watching brief was also completed in accordance with the following guidance:

- Standard and Guidance for Archaeological Watching Brief (Chartered Institute for Archaeologists, 2014);
- Historic England, 2004 Historic England. Human Bones from Archaeological Sites. Guidelines for producing assessment documents and analytical reports;
- Management of Archaeological Projects (English Heritage, 1991);
- Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide (Historic England, 2015); and
- Guidelines for digital archives Royal Commission on Ancient and Historic Monuments of Wales 2015.

Gwynedd Archaeological Trust is certified to ISO 9001:2008 and ISO 14001:2004 (Cert. No. 74180/A/0001/UK/En) and is a Registered Organisation with the Chartered Institute for Archaeologists and a member of the Federation of Archaeological Managers and Employers (FAME).

3 BACKGROUND

3.1 Archaeological and Historical Background

The WWTW scheme is located within an area characterised by post-medieval agricultural and industrial activity as represented by local slate quarries and the settlement of Dinorwig.

An examination of the regional Historic Environment Record confirmed that there were known archaeological receptors within the immediate area (Figure 01). These included:

- Capel Dinorwic, a post-medieval chapel, located in the immediate vicinity of the scheme (National Primary Reference Number (NPRN) 6940; SH58726148);
- the disused Chwarel Fawr slate quarry (Primary Reference Number (PRN) 20088; NGR SH58906160), 213m to the northeast;
- the disused Allt-ddu slate quarry (PRN 20089; NGR SH59166113), 500m to the southeast.

The site is located within the Historic Landscape Characterisation area of Gwaen Gynfi (Area 42). This landscape area is characterised by industrial settlement for Dinorwic quarry workers, regulated by the Vaynol estate and represented by small parciau (enclosures) each supporting a cottage, and some larger sheepfolds.

The first to third edition Ordnance Survey 1-inch to 25-mile County Series maps of the area published in 1889/90, 1900 and 1914 respectively (Sheets XVI.04, XVI.08, XVII.05 and XVII.01; cf. Figures 03 for a reproduction of the first edition map) detailed a field system and industrial layout similar to the present day map (Figure 01), reflecting the well-established nature of the Vaynol Estate lands and industry by this time. The specific field targeted by the GI was on the same layout as the present day.

GAT is separately undertaking an archaeological assessment of the proposed WWTW (GAT Report 1356; forthcoming). Both the information from the assessment and the watching brief will be used to inform any recommendations for further archaeological work (if required).

3.2 Location and geological summary

The proposed WWTW is located within a large irregular shaped field east of a former chapel and schoolhouse (Figure 01). The field comprises semi-improved pasture and slopes to the east and south, with drystone walls forming the boundary lines. The views to the east and south include the Allt-Ddu quarry landscape. The field was characterised by natural water channels, visible on the surface as sinuous lines bifurcating the field, with outcrops of rushes were dotted along the channels.

The local hills of Moel y Ci and Parc Drysgol are composed of lavas and related rocks of the Pre and Early Cambrian period. This forms part of the Padarn Ridge running from Bethesda to Penygroes, including those of the Padarn Tuff Formation. Immediately to the south-east are of much greater economic importance as these are slates (Smith and George, 1961), exploited in the Ogwen valley by the Penrhyn Quarry and in Nant Peris by the Dinorwic Quarry. These are formed by Green mudstones of the Llanberis Slates Formation.

The hard geology has been much eroded and shaped by glaciation. This formed the major valleys and the small corries in which the Marchlyn lakes developed. On the more level ground and in the valleys gleyed soils have developed over the boulder clay, with podsolised soils on the better drained slopes (Ball 1963). The vegetation is restricted to heather and rough grass on the hills and a rich marshland community built on peat within the boggy plateau. The soils to the east of the study area are typical Brown Earths of the Denbigh 1 Association, changing to Cambic Stagnogley soils of the Cegin Association to the west of the Afon Galedffrwd (Soil Survey of England and Wales 1980).

4 METHODOLOGY

4.1 Watching Brief

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, 2014).

An archaeological watching brief can 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).

For this scheme, the archaeological watching brief was completed on an intensive basis during the excavation of the trial holes and specifically monitored the excavation of all soil horizons as far as the glacial horizon. The groundworks were completed by Dawnus Construction Ltd. on 01/02/2017 using a HITACHI ZAXIS 85USB 8-tonne mini digger fitted with a toothless bucket.

4.2 Fieldwork Methodology

All GAT attendances and identified features were recorded using GAT watching brief pro-formas. Photographic images were taken using a digital SLR (Nikon D3100) camera set to maximum resolution (4608 × 3072 12.7 effective megapixels) in RAW format and were converted to TIFF format for archiving using Adobe Photoshop. The photographic record was maintained on site using GAT pro-formas and digitised in *Microsoft Access* as part of the fieldwork archive and dissemination process; a total of 19 images were taken (G2492_015 to G2494_033; q.v. Appendix II);

The final archive will be prepared on approval of the report: the paper records will be retained at GAT, along with a copy of the digital records. The digital records will also be submitted to the Royal Commission on the Ancient and Historical Monuments of Wales in accordance with the *RCAHMW Guidelines for Digital Archives Version 1*. Digital information will include the photographic archive and associated metadata, and the approved report (text and Adobe pdf versions).

In line with the regional Historic Environment Record (HER) requirements, the HER was contacted at the onset of the project and a HER Enquiry Form, provided by the HER, was completed and submitted. A copy of the report will be retained by the HER for public access.

5 RESULTS

The three trial holes were located in close proximity at the southeast corner of an irregular shaped field, 10.5m north of the southern field boundary (Plate 01). The targeted area comprised a semi-improved field with evidence of small water channels crossing the site in irregular patterns. The easternmost field boundary comprised a dilapidated drystone wall on an irregular alignment, which contrasted with the more consolidated field boundaries to the south and west. A dilapidated stone built dwelling, formerly known as *Tynyrardd* (house in the garden), was located to the northwest of the targeted area, within the same field.

5.1 Trial Hole No.1

Dimensions: 4.0m (l) x 0.60m (w) x 5m (d)
Location: NGR SH58776143
Description:

Trial Hole 1 was excavated to a depth of 5m and comprised the following stratigraphy:

- Context 101 – Mid grey brown clay-silt topsoil, containing frequent root action/bioturbation; maximum depth of 0.4m (Plate 02); and
- Context 102 – Light grey-brown glacial clay with sand pockets and small to medium sub-angular stones. The glacial deposit became more solid at 1.3m below ground level (Plate 03), with more frequent sub-angular stone inclusions and turning to boulder clay at 2.1m below ground level (Plate 04). This glacial deposit continued until limit of excavation at 5m.

No archaeological activity or artefacts were identified within the confines of Trial Hole 1 and no waterlogged/organic soil deposits were encountered.

5.2 Trial Hole No.2

Dimensions: 2.8m (l) x 0.60m (w) x 2.5m (d)

Location: NGR SH58786140

Description:

Trial Hole 2 was located 3.4m northwest of Trial Hole 1. Trial Hole 2 was excavated to a depth of 2.5m comprised the following stratigraphy:

- Context 101 – Mid grey brown clay-silt topsoil, containing frequent root action/bioturbation; maximum depth of 0.35m (Plate 05); and
- Context 102 – Light grey-brown glacial clay with sand pockets and small to medium sub-angular and sub-rounded stones. The glacial deposit became more solid at 1.4m below ground level, with more frequent sub-angular stone inclusions. This glacial deposit continued until limit of excavation at 2.5m (Plate 06).

No archaeological activity or artefacts were identified within the confines of Trial Hole 2 and no waterlogged/organic soil deposits were encountered. The stratigraphy in Trial Hole 2 was similar to that encountered in Trial Hole 1.

5.3 Trial Hole No.3

Dimensions: 3.1m (l) x 0.60m (w) x 2.5m (d)

Location: NGR SH58786143

Description:

Trial Hole 3 was located 1.8m southeast of Trial Hole 2 and 3m west of a dilapidated drystone boundary wall. Trial Hole 3 was excavated to a depth of 2.5m and comprised the following stratigraphy:

- Context 101 – Mid grey brown clay-silt topsoil, containing frequent root action/bioturbation; maximum depth of 0.35m (Plate 07); and
- Context 102 – Light grey-brown glacial clay with sand pockets and small to medium sub-angular stones. The glacial deposit was more clay-rich than Trial Holes 1 and 2 and continued in this fashion until limit of excavation at 2.5m (Plate 08).

No archaeological activity or artefacts were identified within the confines of Trial Hole 1 and no waterlogged/organic soil deposits were encountered.

6 CONCLUSION

The results from the three trial holes supported the initial impression at surface level of a semi-improved field that saw limited agricultural use. There was no evidence that it was used for cultivation and appears to have been used for pasture. Whilst the surface conditions suggested potential for sealed waterlogged/organic deposit, these were not encountered and the topsoil directly sealed the glacial horizon; the presence of clay in the glacial horizon provided explanation for the presence of wetland areas across the field, due to more limited the permeability of the below surface deposits. No archaeological activity or artefacts were identified within the confines of the trial holes.

Whilst the trial holes did provide information on the below surface deposits it should also be acknowledged that the total surface area covered by the trail holes of 5.94m^2 represents a small percentage of the proposed WWTW and in this regard cannot be taken as a comprehensive indicator of the below ground potential for the site. Based on current information that the construction of the WWTW groundworks will include ground reduction, it is recommended that a watching brief is maintained during such groundworks.

7 SOURCES CONSULTED

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

DCWW Drawing No. w2281-TH

English Heritage, 1991, *Management of Archaeological Projects*

English Heritage 1995 *Guidelines for the Care of Waterlogged Archaeological Leather . Scientific and Technical Guidelines 4*. London: English Heritage

Historic England, 2004. *Human Bones from Archaeological Sites Guidelines for producing assessment documents and analytical reports*

Historic England, 2011, *Environmental Archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation*

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

Ordnance Survey 1-inch to 25-mile County Series Map Sheets XVI.04, XVI.08, XVII.05 and XVII.01 First Edition (1889 & 1890)

Ordnance Survey 1-inch to 25-mile County Series Map Sheets XVI.04, XVI.08, XVII.05 and XVII.01 Second Edition (1900)

Ordnance Survey 1-inch to 25-mile County Series Map Sheets XVI.04, XVI.08, XVII.05 and XVII.01 Third Edition (1914)

Royal Commission on Ancient and Historic Monuments of Wales 2015 *Guidelines for digital archives*

Standard and Guidance for an archaeological watching brief (Chartered Institute for Archaeologists, 2014).

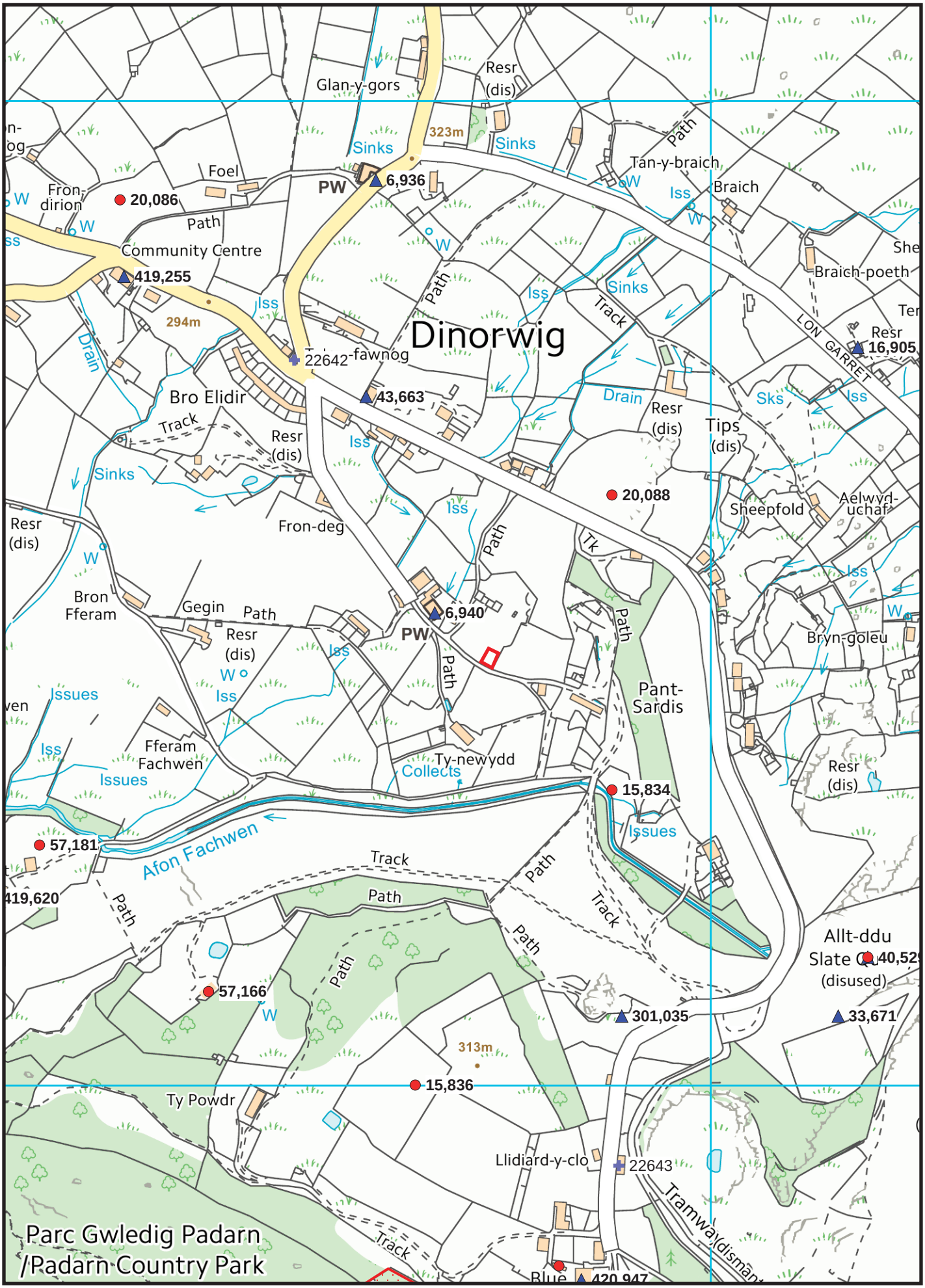
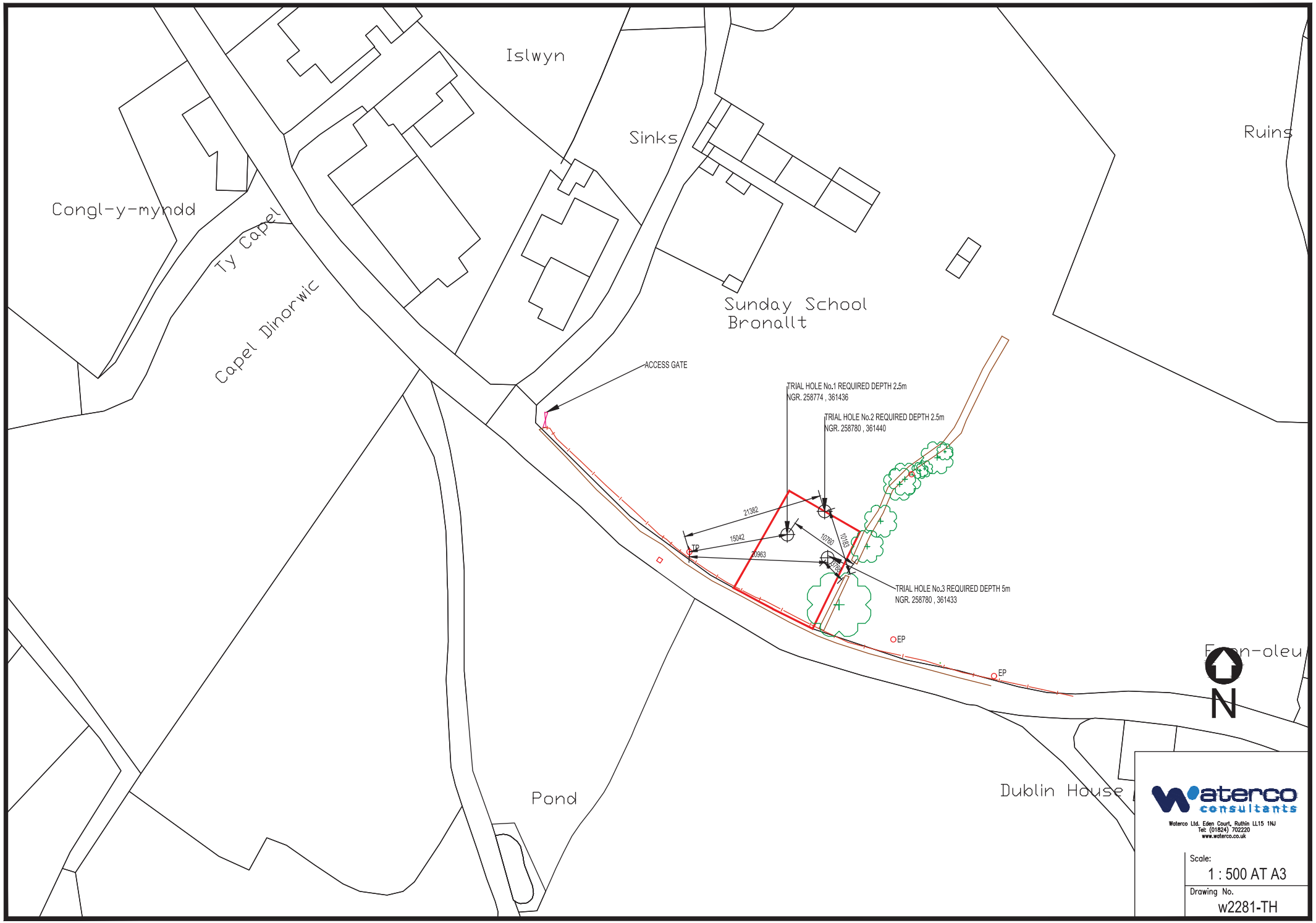


FIGURE 01: Location map detailing WWTW ground investigation area (outline red) and known archaeological sites. Based on Ordnance Survey 1:10000 County Series (Sheet SH56).
Scale: 1:5000@A4. Crown Copyright. All Rights Reserved. License number AL100020895.


Islwyn
Sinks
Ruins
Congl-y-myndd
Ty Capel
Capel Dinorwic
Sunday School
Bronallt
ACCESS GATE
TRIAL HOLE No.1 REQUIRED DEPTH 2.5m
NGR. 258774 , 361436
TRIAL HOLE No.2 REQUIRED DEPTH 2.5m
NGR. 258780 , 361440
TRIAL HOLE No.3 REQUIRED DEPTH 5m
NGR. 258780 , 361433
21382
15042
10963
10760
10765
10768
TP
EP
EP
Pond
Dublin House
N
Waterco consultants
Waterco Ltd. Eden Court, Ruthin LL15 1NJ
Tel: (01824) 702220
www.waterco.co.uk
Scale:
1 : 500 AT A3
Drawing No.
w2281-TH

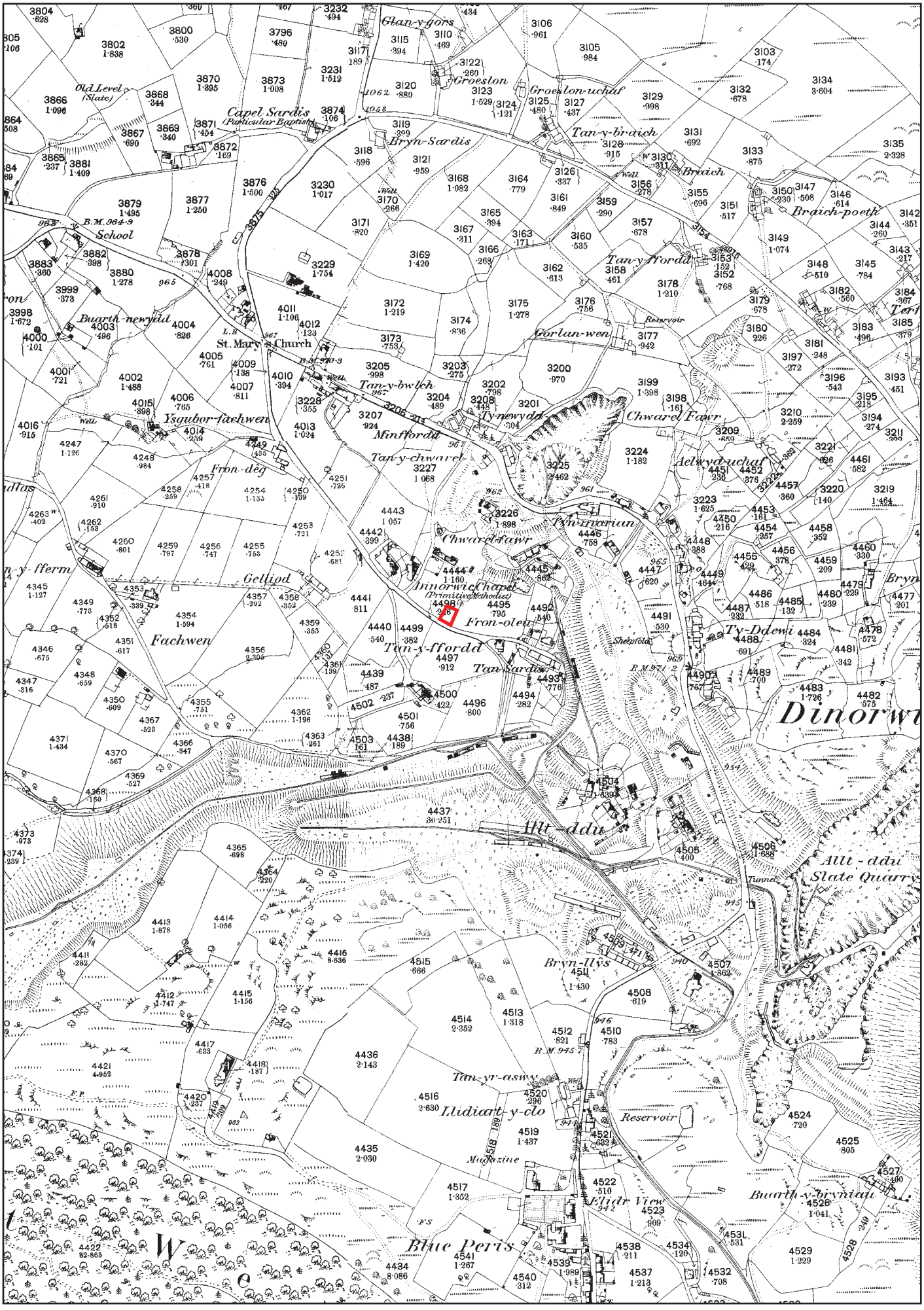
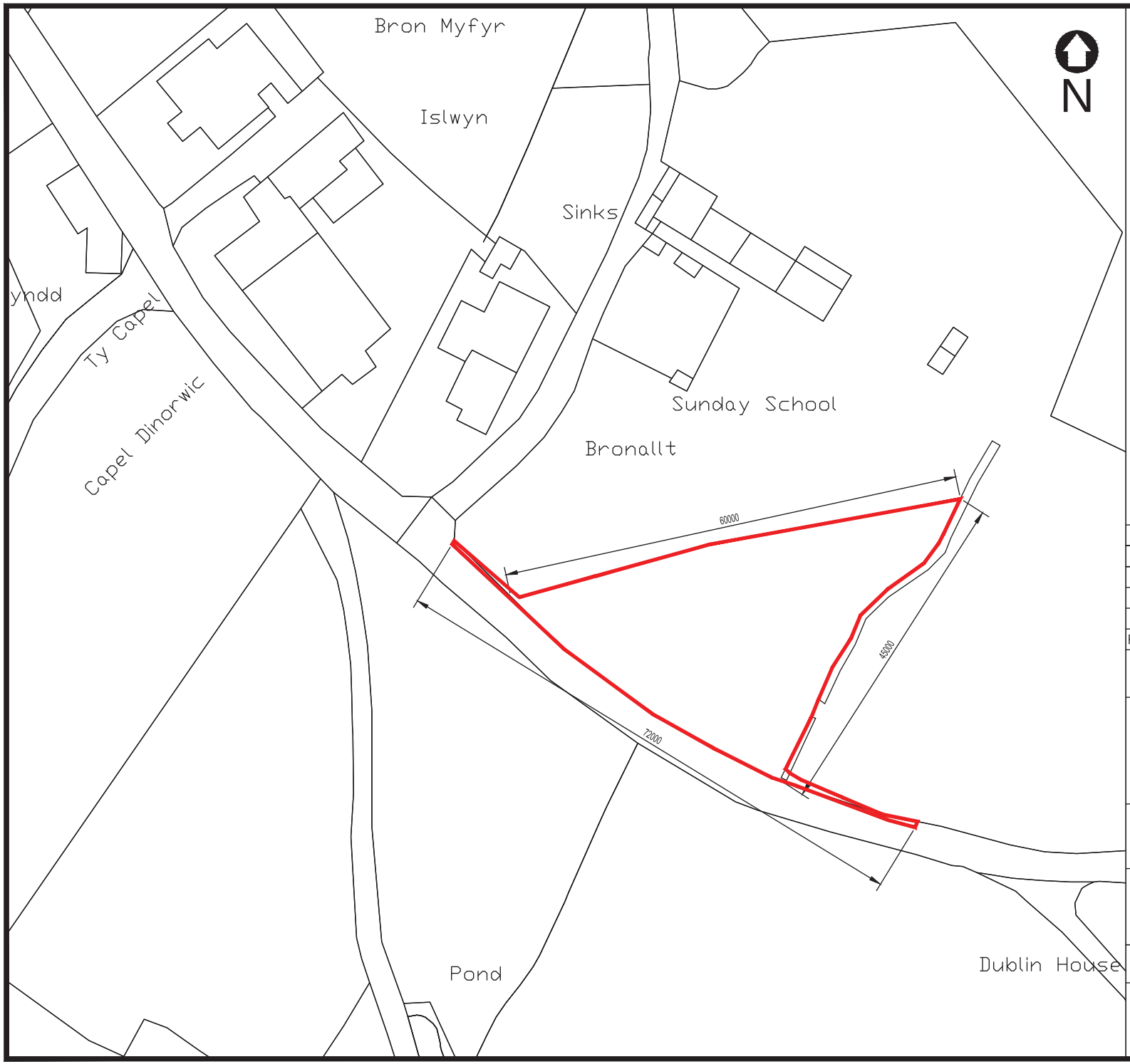


FIGURE 03: Reproduction of Ordnance Survey 1-inch to 25-mile County Series Map Sheets XVI.04, XVI.08, XVII.05 and XVII.01 First Edition (1889/90), including WWTW watching brief area (outlined in red). Scale: 1:5000@A4.

FIGURE 04

Reproduction of DCWW Drawing No. w2281-9205-A00



OWNER

DILYS WILLIAMS
BRON EILIAN
DINORWIC
CAERNARFON
LL55 3ES

LEGEND

LAND TO BE ACQUIRED = 1010m² APPROXIMATELY

N.G.R. 258750, 361453

SCALE 1 : 1000 AT A3

m 20 0 20 40 m

Rev.	Nature of Revision	Drawn	Chkd.	Appd.	Date
L04	WORKING AREA REMOVED	RWP	DRD	KJP	23.01.17
L03	LAND AREA CHANGE	VJ	DRD	KJP	05.12.16
L02	REVISED LAN BOUNDARY	VJ	DRD	KJP	02.12.16
L01	REVISED SITE LOCATION	VJ	DRD	KJP	23.10.16
L00	FIRST ISSUE	VJ	DRD	KJP	31.08.16

NOTICE PLAN

Dŵr Cymru
Welsh Water

DINORWIC CHAPEL WWTW

WwTW AT DINORWIC CHAPEL

Drawn	Checked	Approved	Date
VJ	DRD	KJP	31.08.16

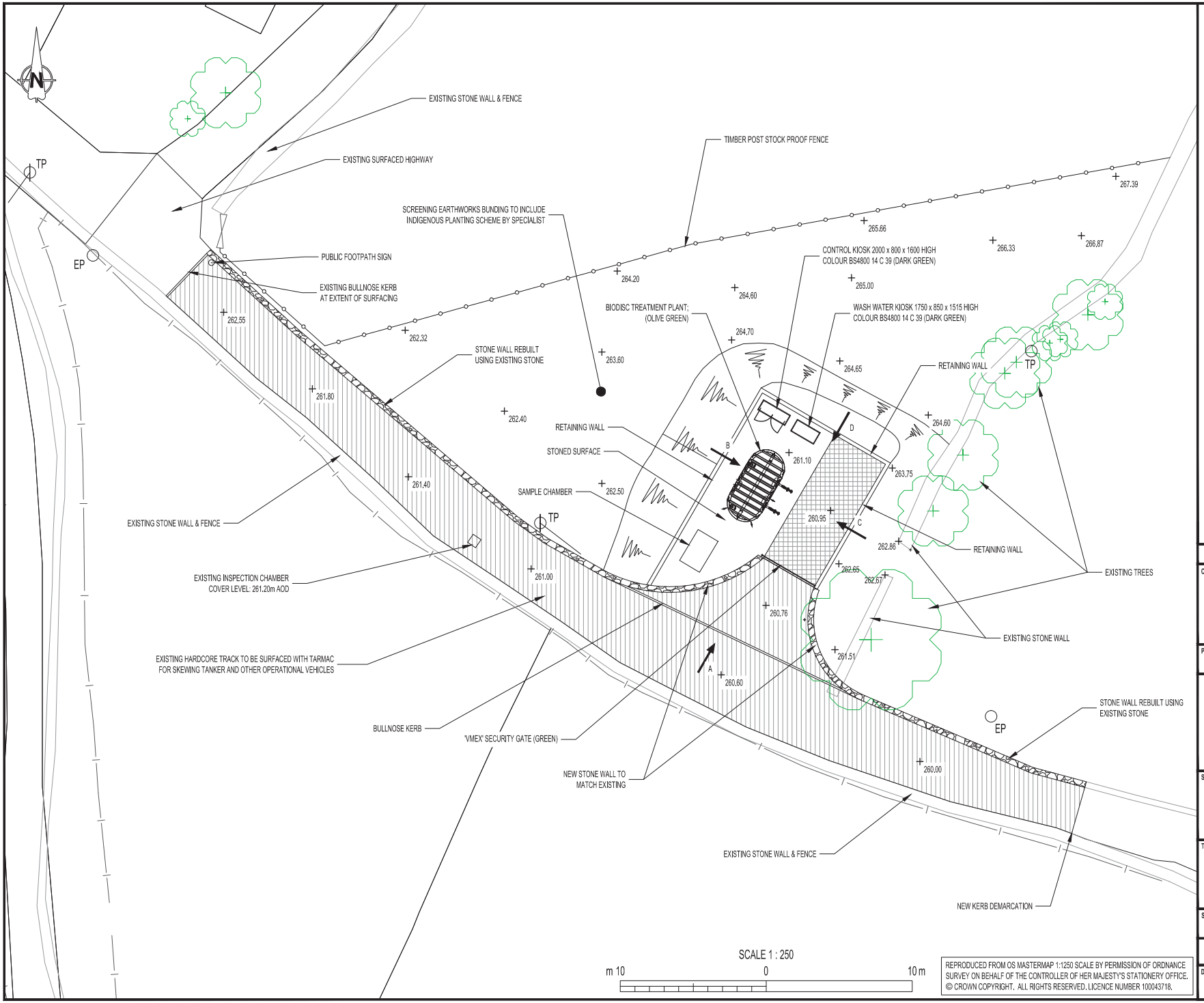
Waterco consultants
Waterco Ltd, Eden Court, Ruthin LL15 1NJ
Tel: (01824) 702220
www.waterco.co.uk

Scale: 1 : 500 AT A3

Drawing No. w2281-9005

FIGURE 05

Reproduction of DCWW Drawing No. w2281-9005-L04



NOTES

1. ALL DIMENSIONS IN MILLIMETRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS SHOWN OTHERWISE.
2. REFER TO DRAWING NO. w2281-9206 FOR PROPOSED ELEVATIONS.

KEY

- CONCRETE SURFACE
- TARMAC SURFACE
- STOCK PROOF FENCE
- 262.00 PROPOSED LEVEL (APPROX.)

SITE LOCATION

GRID REFERENCE: 258775 , 361430
SITE ADDRESS: DINORWIG, CAERNARFON, LL55 3ER

REV.	DATE	DESCRIPTION	DSGN'D	CHK'D	APP'D
A00	19-12-16	FIRST ISSUE	EO	KJP	TM

CLIENT

Dŵr Cymru Welsh Water

PRINCIPAL DESIGNER

DŴR CYMRU WELSH WATER

waterco consultants

Waterco Ltd., Eden Court, Lon Parcwr Business Park, Ruthin LL15 1NJ
tel (+44) 1824 702220
www.waterco.co.uk

SCHEME

DINORWIG CHAPEL WwTW

TITLE

PROPOSED SITE LAYOUT PLAN

STATUS

PLANNING APPLICATION

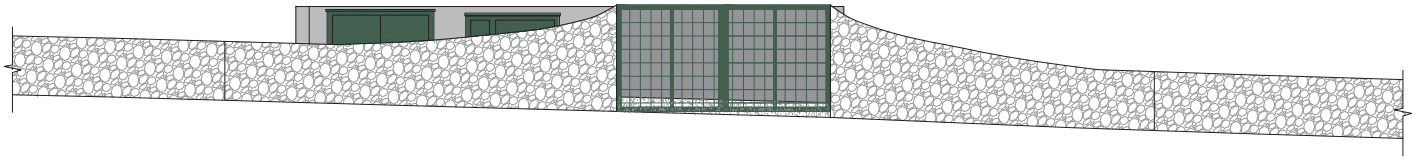
DESIGNED	CHECKED	APPROVED	SCALE / SHEET SIZE
EO	KJP	TM	1 : 250 / A3

DRAWING NO. w2281-9205

REV A00

FIGURE 06

Reproduction of DCWW Drawing No. w2281-9206-A00



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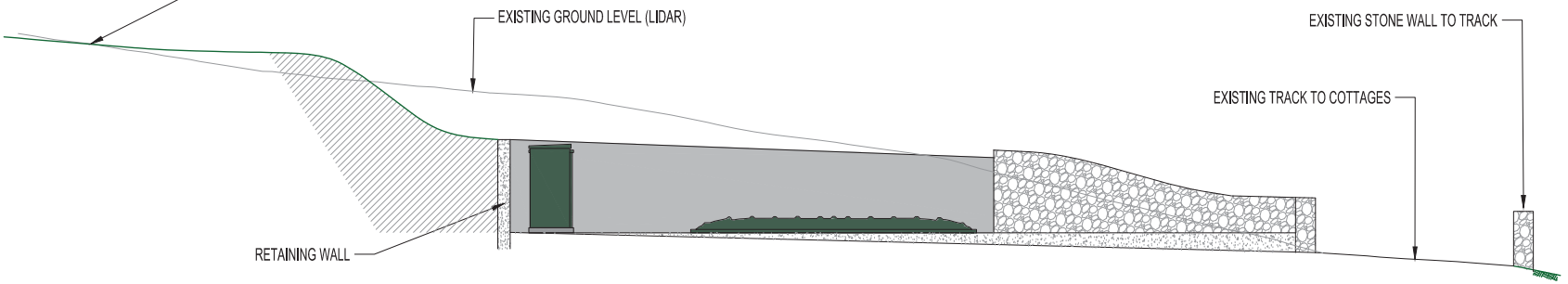
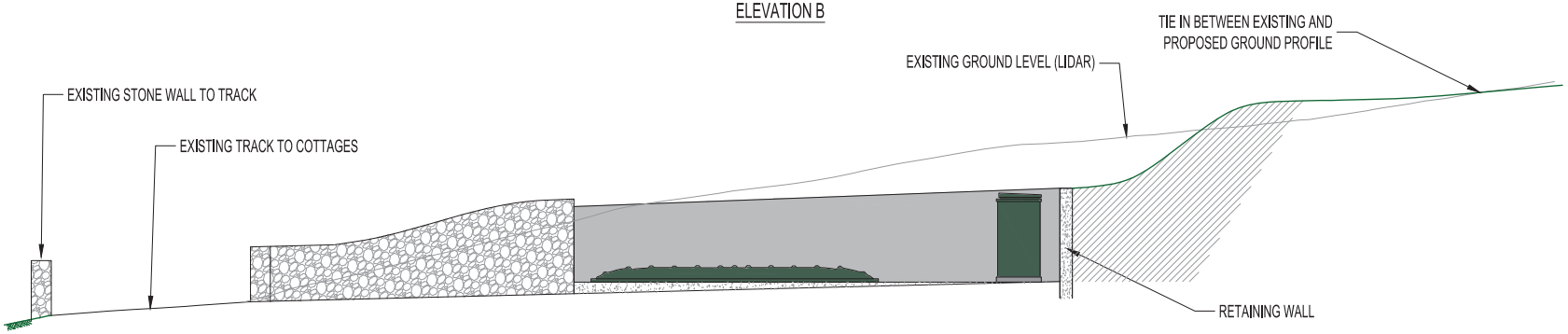
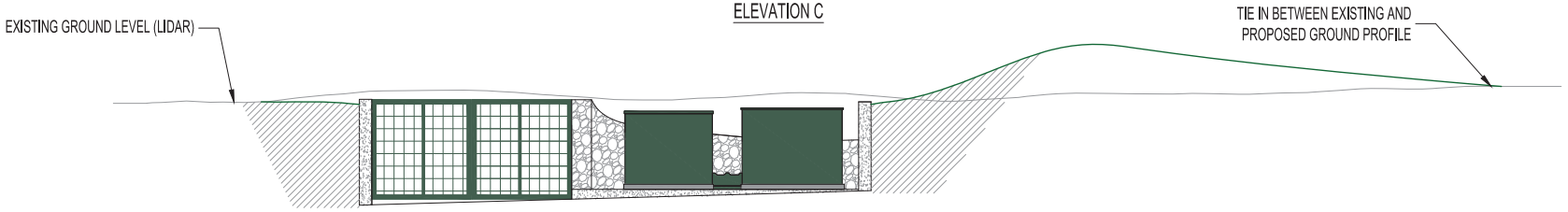


ELEVATION B



ELEVATION C



ELEVATION D

SCALE 1 : 100

m 1 0 10 m

NOTES

1. REFER TO DRAWING NO. w2281-9205 FOR ELEVATION ARROWS.

KEY

- CONCRETE RETAINING WALLS
- KIOSK, WASHWATER CABINETS & BIODISC PLANT
- MASONRY WALLS TO MATCH EXISTING "LOCAL STONE"

REV.	DATE	DESCRIPTION	DSGN'D	CHK'D	APP'D
A00	19-12-16	FIRST ISSUE	EO	KJP	TM

CLIENT

Dŵr Cymru Welsh Water

PRINCIPAL DESIGNER

DŴR CYMRU WELSH WATER

waterco consultants

Waterco Ltd., Eden Court, Lon Parcwr Business Park, Ruthin LL15 1NJ
tel (+44) 1824 702220
www.waterco.co.uk

SCHEME

DINORWIG CHAPEL WwTW

TITLE

PROPOSED ELEVATIONS

STATUS

PLANNING APPLICATION

DESIGNED	CHECKED	APPROVED	SCALE / SHEET SIZE
EO	KJP	TM	1 : 100 / A3

DRAWING NO. w2281-9206

REV A00

Plate 01: General view of the three trial hole areas prior to excavation; scale: 1.0m (archive image: G2492_015)

Plate 02: Trial Hole 1 - working shot of Trial hole 1 during excavation and removal of topsoil (archive image: G2492_016)

Plate 03: Trial Hole 1 - west facing section of Trial Hole 1 on encountering of glacial horizon at 1.3m; scale: 1.0m (archive image: G2492_017)

Plate 04: Trial Hole 1 - general view of Trial Hole 1 at limit of excavation of 2.1m (archive image: G2492_019)

Plate 05: Trial Hole 2 - south-facing section in Trial Hole 2, detailing interface between topsoil and glacial horizon; scale: 1.0m (archive image: G2492_024)

Plate 06: Trial Hole 2 - general view of Trial hole 2 at limit of excavation of 2.5m (archive image: G2492_026)

Plate 07: Trial Hole 3 - south-facing section in Trial Hole 3, detailing interface between topsoil and glacial horizon; scale: 1.0m (archive image: G2492_028)

Plate 08: Trial Hole 3 - limit of excavation in Trial hole 3 of 2.5m (archive image: G2492_029)

APPENDIX I

Gwynedd Archaeological Trust project design (January 2017)

DINORWIG WASTEWATER TREATMENT WORKS (G2487)

PROJECT DESIGN FOR ARCHAEOLOGICAL WATCHING BRIEF

Prepared for

Waterco Ltd

January 2017

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

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

DINORWIG WASTEWATER TREATMENT WORKS

PROJECT DESIGN FOR ARCHAEOLOGICAL WATCHING BRIEF

Prepared for *Waterco Ltd*, January 2017

CONTENTS

1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) has been asked by *Waterco Ltd* to prepare a project design for an archaeological watching brief during geotechnical ground investigation works (GI) for a proposed wastewater treatment works (WWTW) at Dinorwig, Gwynedd (NGR SH58746145; Figure 01). The designated area is located with a large field close to Capel Dinorwig. The specific design of the WWTW has not been confirmed, but the watching brief will monitor the GI locations as detailed in DCWW Drawing No. w2281-TH (Figure 02). The GI will include three trial holes based on the following dimensions:

- Trial Hole No.1 required depth 2.5m; location: NGR SH58776143;
- Trial Hole No.2 required depth 2.5m; location: NGR SH58786140; and
- Trial Hole No.3 required depth 5m; location: NGR. SH58786143.

The trial holes will each have an estimated width and length of 0.60m and 4.0m. The GI will be undertaken by Dawnus Construction Ltd. and is scheduled to be completed on 01/02/2017.

The watching brief will be completed in accordance with the following guidance:

- Standard and Guidance for Archaeological Watching Brief (Chartered Institute for Archaeologists, 2014);
- Historic England, 2004 Historic England. Human Bones from Archaeological Sites. Guidelines for producing assessment documents and analytical reports;
- Management of Archaeological Projects (English Heritage, 1991);
- Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide (Historic England, 2015); and
- Guidelines for digital archives Royal Commission on Ancient and Historic Monuments of Wales 2015.

The watching brief will be monitored by the Gwynedd Archaeological Planning Services (GAPS); the content of this design and all subsequent reporting by GAT must be approved by GAPS prior to final issue.

Gwynedd Archaeological Trust is certified to ISO 9001:2008 and ISO 14001:2004 (Cert. No. 74180/A/0001/UK/En) and is a Registered Organisation with the Chartered Institute for Archaeologists and a member of the Federation of Archaeological Managers and Employers (FAME).

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

The WWTW scheme is located within an area characterised by post-medieval agricultural and industrial activity as represented by local slate quarries and the settlement of Dinorwig.

A brief examination of the regional Historic Environment Record has confirmed that there are a limited number of known archaeological receptors within the immediate area. These include Capel Dinorwic located in the immediate vicinity of the scheme, Chwarel Fawr slate quarry (disused), 213m to the northeast and Allt-ddu slate quarry (disused), 500m to the southeast. The site is located within the Historic Landscape Characterisation area of Gwaen Gynfi (Area 42). This landscape area is characterised by industrial settlement for Dinorwic quarry workers, regulated by the Vaynol estate and represented by small parciau (enclosures) each supporting a cottage, and some larger sheepfolds.

The first to third edition Ordnance Survey 1-inch to 25-mile County Series maps of the area published in 1889/90, 1900 and 1914 respectively (Sheets XVI.04, XVI.08, XVII.05 and XVII.01; Figures 03 to 05) detail a field system and industrial layout similar to the present day map (Figure 01), reflecting the well-established nature of the Vaynol Estate lands and industry by this time. The specific fields encompassed by the proposed WWTW are the same layout as the present day.

GAT is also undertaking an archaeological assessment of the proposed WWTW (GAT Report 1356; forthcoming).

3 METHODOLOGY

3.1 Watching Brief

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, 2014).

An archaeological watching brief can 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).

For this scheme, the archaeological watching brief will be completed on an intensive basis during groundworks, specifically monitoring the excavation of all soil horizons as far as the glacial horizon. It is currently expected that 1No project archaeologist will be in attendance.

Dawnus Construction Ltd. have prepared a method statement for the GI (Appendix III), which confirms that a toothless bucket will be used.

GAT fieldwork methodology is discussed in para. 3.2.

3.2 Fieldwork Methodology

- During the watching brief, all attendances and identified features will be recorded using GAT watching brief pro-formas (Appendix II);

- Photographic images will be taken using a digital SLR (Nikon D40) camera set to maximum resolution (3008 × 2000 6.1 effective megapixels) in RAW format and will be converted to TIFF and JPEG format for archiving using Adobe Photoshop; a photographic record will maintained on site using GAT pro-formas (Appendix I) and digitised in *Microsoft Access* as part of the fieldwork archive and dissemination process. Photographic images will be archived in TIFF format; the archive numbering system will start from **G2492_015**. A photographic ID board will be used during watching brief to record site code, test hole number, date, image orientation and any relevant context numbers. Photographic images will also be taken for each test hole location prior to excavation along with general shots of the area.

- Any subsurface remains will be recorded photographically, with detailed notations and a measured survey;

- The site contractor method statement (Appendix III; Item 14.12) prohibits entry into the trial holes. If the GAT archaeologist is not allowed access on discovery of archaeological activity, then the trial hole must be backfilled upon exposure of archaeological deposits in order to facilitate their investigation at a later stage of archaeological works (e.g. evaluation trenching). The trial hole will need to be resited to avoid any continuation of the archaeological deposits/features, so far as can be reasonably predicted. If access to the trail holes is allowed to investigate archaeological activity, then any archaeological features/deposits/structures encountered will be manually cleaned and examined to determine extent, function, date and relationship to adjacent features. If encountered, the following minimum strategy will initially apply: 50% sample of each sub-circular feature, 10% sample of each linear feature. *In the event of the identification of extensive/complex remains (e.g. burials or structures), additional time, resourcing and costs may be required for GAT to complete an appropriate programme of works; this may also incur a delay to the GI programme*;

- Any required sections and detailed elevations to be drawn at a minimum 1:10 scale using GAT A4 or A2 pro-forma permatrace;

- Any required plans to be at a minimum 1:20 scale. Plans will be drawn on GAT A4 or A2 pro-forma permatrace;

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

3.3 Human Remains

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

Non-fragmented skeletal remains will be excavated using wooden tools and collected and stored in polyethylene bags (with appropriate references for context, grave number, et al) and placed in a lidded cardboard archive box (note: separate boxes for each grave) and stored in a suitable manner within GAT premises. If significant quantities of human remains are encountered, a human osteologist should be contacted and appointed to advise the team during the fieldwork. The osteologist will be an external appointment (Lucy Whittingham | Project Manager (post-excavation) | AOC Archaeology | tel: 0208 843 7380 | email: lucy.whittingham@aocarchaeology.com), who will assist in devising the excavation, recording and sampling strategy for features containing human remains. The osteologist should also help to ensure that adequate post-excavation processing of human remains is carried out so that the material is in a fit state for assessment during the post-excavation stage. For inhumations, this will involve washing, drying, marking and packing.

If human remains are recovered that are deemed suitable for further assessment/analysis, this will be completed in accordance with the osteologist's requirements and with *Human Bones from Archaeological Sites Guidelines for producing assessment documents and analytical reports* (Historic England, 2004).

3.4 Ecofacts

Due to the existing ground conditions and the presence of semi-improved wetland areas, it is likely that waterlogged/organic deposits will be encountered, including peat deposits. Bulk samples will not be taken by GAT from any waterlogged/organic deposits/peat deposits, but the GAT archaeologist will monitor and record the depth and context of the deposit or deposits. Based on initial results and potential, e.g., an extensive depth of peat, recourse may be made to a specialist (via Lucy Whittingham | Project Manager (post-excavation) | AOC Archaeology | tel: 0208 843 7380 | email: lucy.whittingham@aocarchaeology.com) for advice on a palaeoenvironmental assessment and analysis strategy.

Should any archaeological features be identified that include sealed deposits deemed suitable for dating, samples will be taken of not less than 40 litres for bulk samples (or 100% if the feature is smaller). The sampling strategy will be undertaken in accordance with the principles set out in *Environmental Archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation* (Historic England, 2011).

For any ecofact samples taken from human burials, this will be completed in accordance with an appointed osteologist's guidance.

3.5 Artefacts

Diagnostic artefacts will be retained for further examination and identification. Pottery sherds of 19th and 20th century date will be examined on site and the context from which they were retrieved noted but the sherds will not be retained. The artefacts 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 English Heritage (1995) 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 | tel: 0208 843 7380 | email: lucy.whittingham@aocarchaeology.com).

All finds are the property of the landowner; however, it is Trust policy to recommend that all finds are donated to an appropriate museum, (in this case STORIEL, Ffordd Gwynedd, Bangor, Gwynedd LL57 1DT), where they can receive specialist treatment and 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 any additional advice would be sought from 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 National Museums and Galleries of Wales acts as advisor on technical matters, and may be the recipient body for the objects.

The National Museums and Galleries of Wales 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 Waterco Ltd) for agreement regarding the transfer of artefacts, initially to GAT and subsequently to the relevant museum (STORIEL, Ffordd

Gwynedd, Bangor, Gwynedd LL57 1DT). 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. If artefacts are transferred to STORIEL, this must be in accordance with their current guidelines.

3.6 Fieldwork Archiving

Following the completion of the fieldwork, a programme of field work archiving will be completed based on following task list;

1. Pro-formas: all cross referenced and complete;
2. Photographic Metadata: completed in *Microsoft Access* and cross-referenced with all pro-formas;
3. Sections: all cross referenced and complete;
4. Survey data: downloaded using a Computer Aided Design package;
5. Plans: 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 data will be processed, final illustrations will be compiled and a report will be produced which will detail and synthesise the results.

4 PROCESSING DATA, ILLUSTRATION, REPORT AND ARCHIVING

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

1. Non-technical summary
2. Introduction
3. Aims and purpose
4. Specification
5. Methods and techniques, including details and location of project archive
6. Watching Brief Results
7. Summary and conclusions (including any further recommendations – if relevant)
8. List of sources consulted.
9. Appendix I – approved GAT project specification

Illustrations will include plans of the location, site plans and elevations. Historical maps, when appropriate and if copyright permissions allow, will be included. A draft copy of the report will be sent to the client prior to production of the final report.

5 DISSEMINATION AND ARCHIVING

A full archive including plans, photographs, written material and any other material resulting from the project will be prepared. The archaeological mitigation outlined in this project specification will commence in February 2017. A draft report (or interim report) will be submitted within one month of fieldwork completion (end date tbc); a final report will be submitted to the Historic Environment within six months of submitting the draft report (submission date tbc).

The following dissemination will apply:

- A paper report(s) plus digital report(s) will be provided to the client and GAPS (draft report then final report);
- A paper report plus a digital report will be provided to the regional Historic Environment Record, Gwynedd Archaeological Trust; this will be submitted within six months of report completion (final report only);
- A digital report and archive (including photographic and drawn) data will be provided to Royal Commission on Ancient and Historic Monuments, Wales (final report only);
- Submission of digital information to the Royal Commission on the Ancient and Historical Monuments of Wales shall be undertaken in accordance with the *RCAHMW Guidelines for Digital Archives Version 1*. Digital information will include the photographic archive and associated metadata;
- Dependent on the results of the watching brief a summary note or a specific article will be included in the Council for British Archaeology Wales publication *Archaeology in Wales*. This shall be agreed with GAPS, and client in advance of publication along with all publication content. GAPS involvement in the project will be acknowledged therein.

3.7 Historic Environment Record

In line with the regional Historic Environment Record (HER) requirements, the HER must 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. At the onset, the HER Enquiry Form provided by the HER, will be completed and submitted.

6 PERSONNEL

The project will be managed by John Roberts, Principal Archaeologist GAT Contracts Section and attended by a team of project archaeologists. The project archaeologist will be responsible for the watching brief, including all field management duties, e.g., GAPS liaison, main contractor liaison, osteologist or palaeoenvironmentalist liaison (if relevant). The project archaeologist will be responsible for completing the watching brief record sheets as well as all other on site pro-formas and the fieldwork archive itemised in para. 3.9. The project archaeologist will also be responsible for submitting a draft final report (or interim report) for project manager review and approval. The report will then be submitted as per the arrangements defined in para. 5.

7 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 site 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 staff will be issued with required personal safety equipment, including high visibility jacket, steel toe-capped boots and hard hat.

8 INSURANCE

Public Liability

Limit of Indemnity- £5,000,000 any one event in respect of Public Liability

INSURER Aviva Insurance Limited

POLICY TYPE Public Liability

POLICY NUMBER 24765101CHC/000405

EXPIRY DATE 22/06/2017

Employers Liability

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

The cover has been issued on the insurers standard policy form and is subject to their usual terms and conditions. A copy of the policy wording is available on request.

INSURER Aviva Insurance Limited

POLICY TYPE Employers Liability

POLICY NUMBER 24765101CHC/000405

EXPIRY DATE 22/06/2017

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

HU PI 9129989/1208

EXPIRY DATE 23/07/2017

9 SOURCES CONSULTED

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

DCWW Drawing No. w2281-TH

English Heritage, 1991, *Management of Archaeological Projects*

English Heritage 1995 *Guidelines for the Care of Waterlogged Archaeological Leather . Scientific and Technical Guidelines 4*. London: English Heritage

Historic England, 2004. *Human Bones from Archaeological Sites Guidelines for producing assessment documents and analytical reports*

Historic England, 2011, *Environmental Archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation*

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

Ordnance Survey 1-inch to 25-mile County Series Map Sheets XVI.04, XVI.08, XVII.05 and XVII.01 First Edition (1889 & 1890)

Ordnance Survey 1-inch to 25-mile County Series Map Sheets XVI.04, XVI.08, XVII.05 and XVII.01 Second Edition (1900)

Ordnance Survey 1-inch to 25-mile County Series Map Sheets XVI.04, XVI.08, XVII.05 and XVII.01 Third Edition (1914)

Royal Commission on Ancient and Historic Monuments of Wales 2015 *Guidelines for digital archives*

Standard and Guidance for an archaeological watching brief (Chartered Institute for Archaeologists, 2014).

FIGURE 01

Location map detailing WWTW watching brief area. Based on Ordnance Survey 1:10000 County Series (Sheet SH56). Scale: 1:5000@A4. Crown Copyright. All Rights Reserved. License number AL100020895.

FIGURE 01: Location map detailing WWTW assessment area (outline red).
Based on Ordnance Survey 1:10000 County Series (Sheet SH56).
Scale: 1:5000@A4. Crown Copyright. All Rights Reserved. License number AL100020895.

FIGURE 02

Reproduction of DCWW Drawing No. w2281-TH, detailing the watching brief area. Scale: 1:1000@A3.

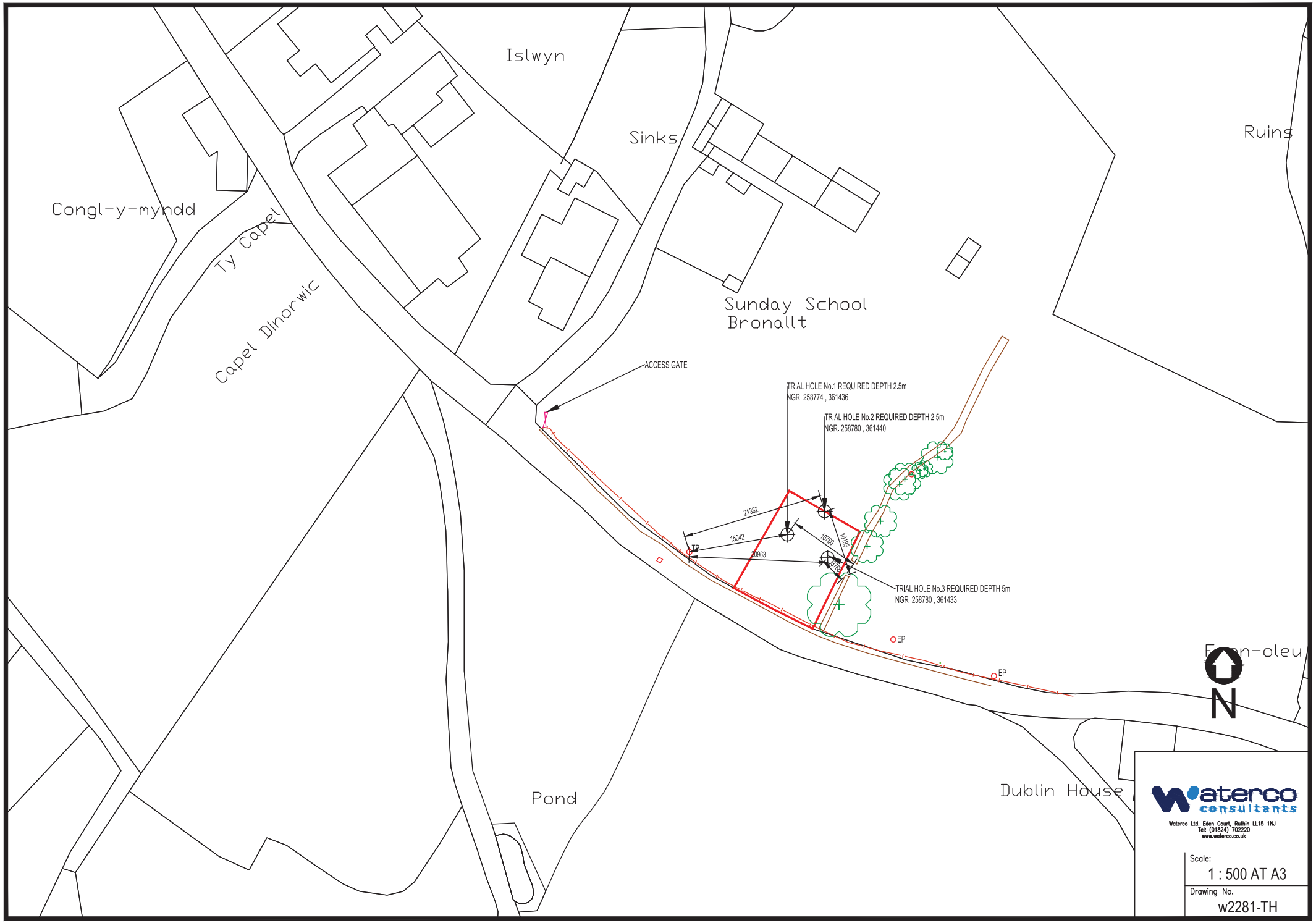

Islwyn
Sinks
Ruins
Congl-y-myndd
Ty Capel
Capel Dinorwic
Sunday School
Bronallt
ACCESS GATE
TRIAL HOLE No.1 REQUIRED DEPTH 2.5m
NGR. 258774 , 361436
TRIAL HOLE No.2 REQUIRED DEPTH 2.5m
NGR. 258780 , 361440
TRIAL HOLE No.3 REQUIRED DEPTH 5m
NGR. 258780 , 361433
21382
15042
10963
10760
10765
10768
TP
EP
EP
Pond
Dublin House
N
Waterco consultants
Waterco Ltd. Eden Court, Ruthin LL15 1NJ
Tel: (01824) 702220
www.waterco.co.uk
Scale:
1 : 500 AT A3
Drawing No.
w2281-TH

FIGURE 03

Reproduction of Ordnance Survey 1-inch to 25-mile County Series Map Sheets XVI.04, XVI.08, XVII.05 and XVII.01 First Edition (1889 & 1890), including WWTW watching brief area. Scale: 1:5000@A4.

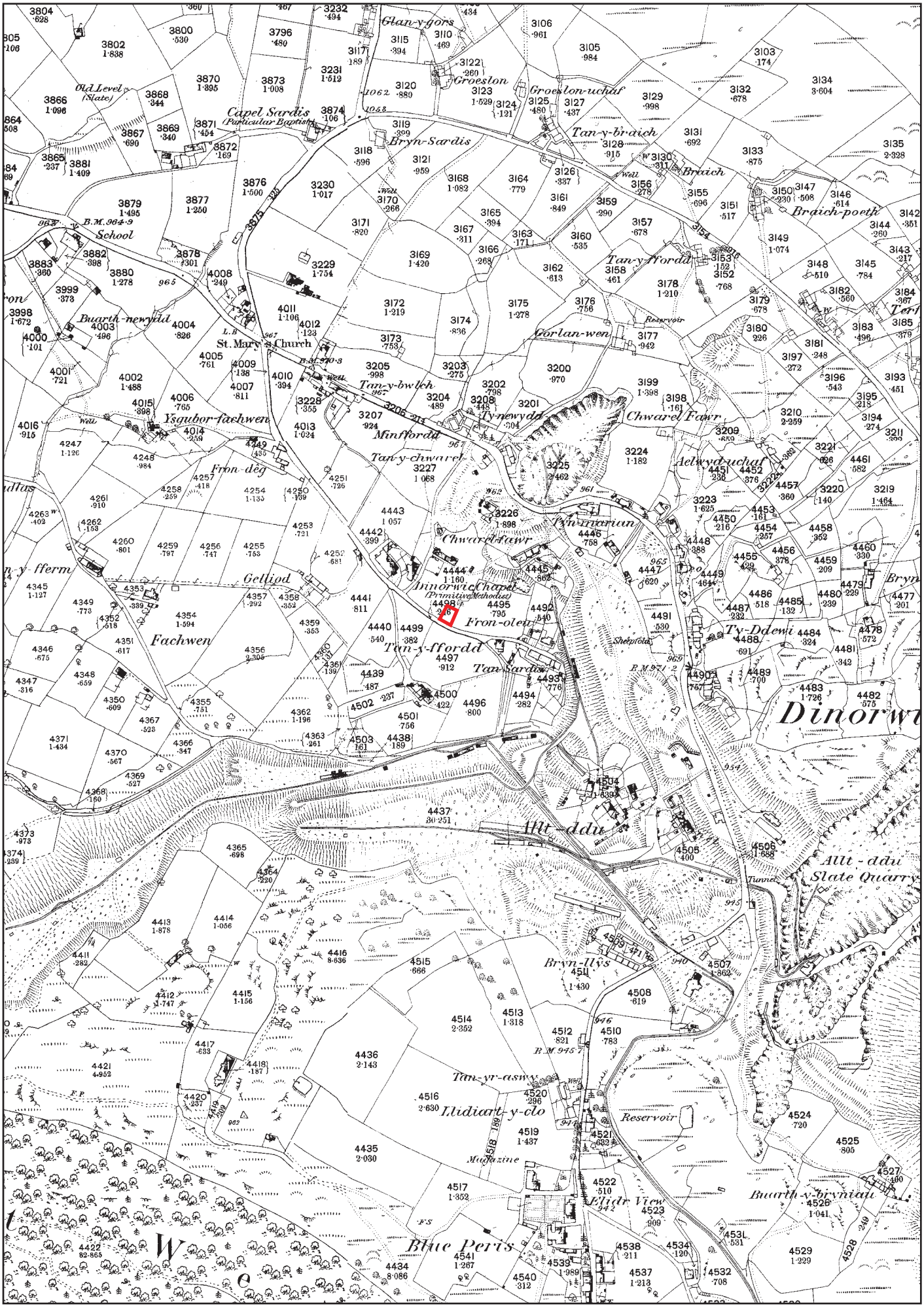


FIGURE 03: Reproduction of Ordnance Survey 1-inch to 25-mile County Series Map Sheets XVI.04, XVI.08, XVII.05 and XVII.01 First Edition (1889/90), including WWTW watching brief area (outlined in red). Scale: 1:5000@A4.

FIGURE 04

Reproduction of Ordnance Survey 1-inch to 25-mile County Series Map Sheets XVI.04, XVI.08, XVII.05 and XVII.01 Second Edition (1900), including WWTW watching brief area. Scale: 1:5000@A4.

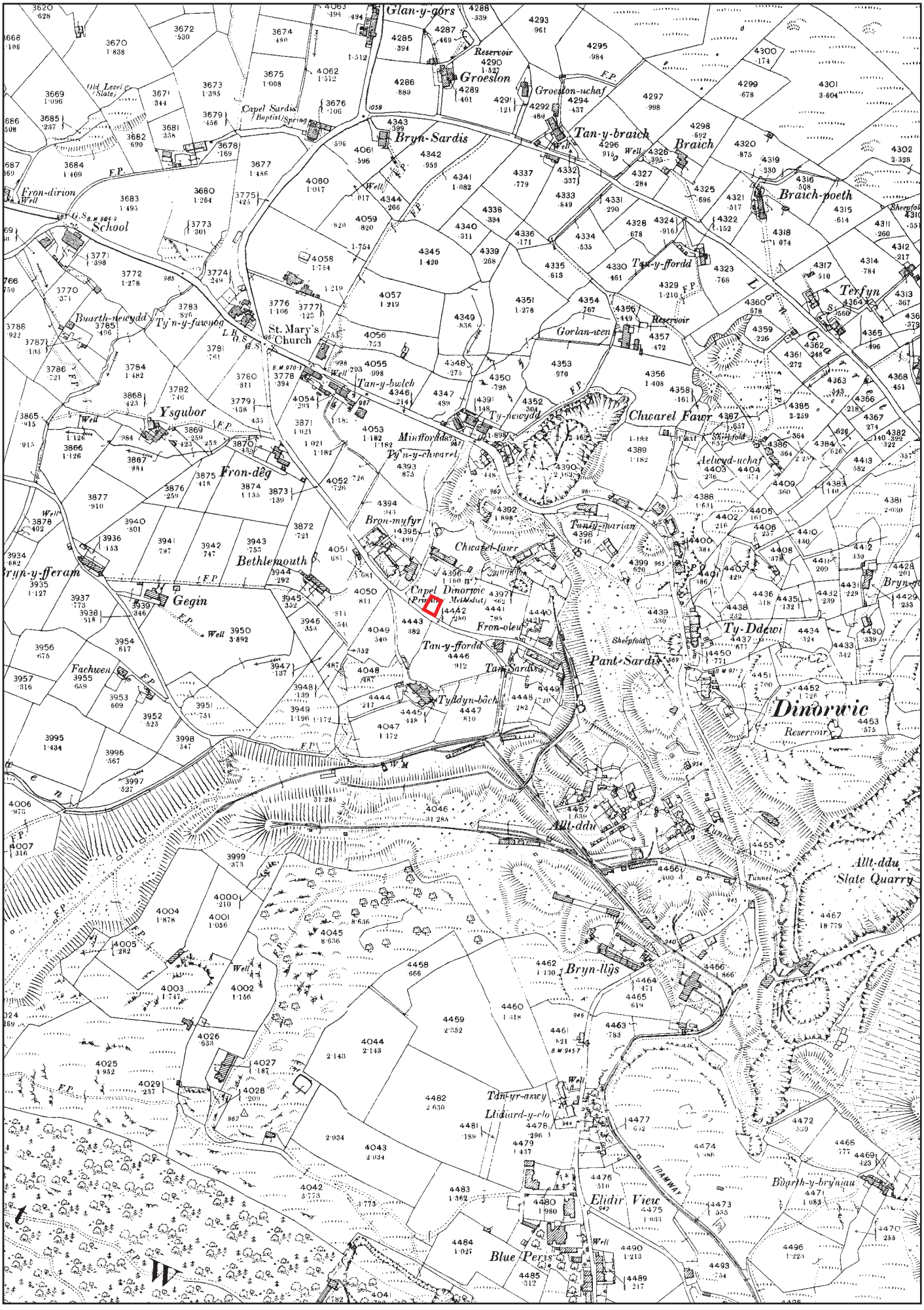


FIGURE 04: Reproduction of Ordnance Survey 1-inch to 25-mile County Series Map Sheets XVI.04, XVI.08, XVII.05 and XVII.01 Second Edition (1900), including WWTW watching brief area (outlined in red). Scale: 1:5000@A4.

FIGURE 05

Reproduction of Ordnance Survey 1-inch to 25-mile County Series Map Sheets XVI.04, XVI.08, XVII.05 and XVII.01 Third Edition (1914), including WWTW watching brief area. Scale: 1:5000@A4.

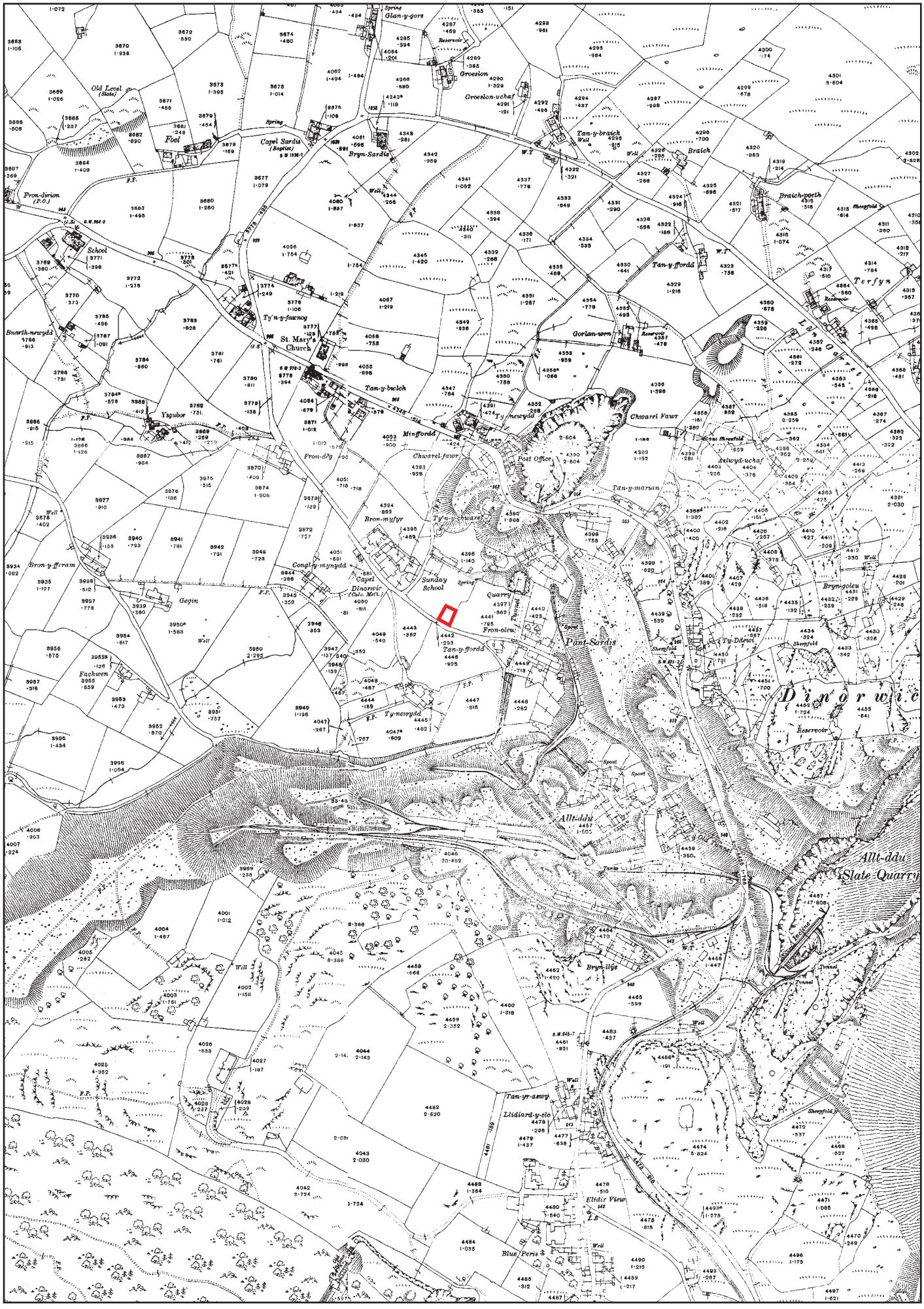


FIGURE 05: Reproduction of Ordnance Survey 1-inch to 25-mile County Series Map Sheets XVI.04, XVI.08, XVII.05 and XVII.01 Third Edition (1914), including WWTW watching brief area (outlined in red). Scale: 1:5000@A4.

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.	**Trench**	**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

Dawnus Construction Limited Method Statement

METHOD STATEMENT

Project No.	
Project Name	Dinorwig Trial Holes
Method Statement Number	001
Method Statement Title	Trial Holes

DOCUMENT REVISION & APPROVAL					
Rev	**Date**	**Prepared by / Date**	**Approved by / Date**	**Customer Approval / Date**	**Approval Code**
0	26/01/17	Iwan Pritchard 26/01/17			
Approval Codes:-	A – Accepted for construction B – Accepted subject to comments. Incorporate and reissue prior to works commencing. C – Not accepted. Resubmit for acceptance / incorporating comments.				
Distribution:-	Project Manager; Site Manager; General Foreman; Site Engineer; Operatives Site Notice Board Employers Representative				

Index

1.0 Scope of the Works

This method statement outlines the safe method of work for the following:-

- Site investigation work
- Mark out services
- Trial holes
- Setting out/ Surveying operations

The aim of this method statement is to highlight the activities, hazards and mitigating measures establishment for the site / compound establishment.

2.0 References

- Services drawings
- Trial Hole drawing
- Permit to Excavate
- Site Plan

3.0 Hazards Identified

- Excavation works
- Underground and overhead services

4.0 Risk Assessment

As Attached

5.0 Personal Protective Equipment

The minimum required PPE for this site is outlined in the Site Induction and will be briefed to all personnel. This includes Hi-Visibility jacket / vest, safety helmet (hard hat), safety footwear (safety boots incorporating steel toe-caps and mid-sole).

6.0 Emergency Procedures

- Muster point is located in the site compound.
- Upon hearing the emergency alarm (3 blast of an air horn) make way to the muster point.
- Report any accidents, incidents or near miss to the site manager.
- Spill kits located in the work pick up.
- Stop work in adverse weather e.g. high winds.
- First Aid kit, eye wash station, burns kit and accident book is located in the work pickup.
- On discovering a fire raise the alarm and make way to muster point.
- Fire extinguishers are located in the site offices and on site.
- Nearest A and E is Ysbyty Gwynedd Bangor, directions on notice board

7.0 Responsibilities & Personnel

Site Agent	Iwan Pritchard
General Foreman	Gordon White
Site Engineer	Iwan Pritchard
First Aid	Iwan Pritchard/Gordon White
COSHH Coordinator	Iwan Pritchard
Site Plant coordinator	Gordon White

8.0 Plant & Equipment

- Welfare units – Will be located in the Dawuns' Penisarwaun WwTW
- Fencing
- CAT and Genny
- Small tools
- Signs
- Excavator

9.0 Materials

All materials and equipment will be stored in a safe way at designated locations and will be left secure at breaks and at the end of shifts.

10.0 Planning

Works are envisaged to start and be complete the 1th of February

11.0 Temporary Works

N/A

12.0 Work Area & Access / Egress

- LL55 3ER
- All deliveries will be advised on the narrow roads leading up to the site.
- Access to the site will be will be from the A4244, through Deiniolen towards Dinoriwg. At the crossroads in the village of Dinoriwg turn right, the site is located 300 metres down the road on the left.
- Temporary signage will be placed in order to warn vehicles and pedestrians of the construction site.
- Loading and unloading will take place near the crossroads due to the narrow road leading to site. Banksman will then lead the excavator to site.
- All plant movement within the site will be controlled by banksman
- Reversing will be kept to a minimum

13.0 Public Interface

- The work area will be fenced off to prevent unauthorised access to the site.
- All deliveries to site will be directed by banksman, reversing to be kept to a minimum.

14.0 Method of Works/ Programme

Pre start

1. All personnel will receive a Site Specific Induction.
2. Method Statement and Risk Assessment briefing to be given before work starts and when the work method changes due to unforeseen risks.
3. Service Plans to be obtained.
4. Trial holes to be marked out by engineer.
5. Area will be scanned with CAT scanner by a trained operator.
6. Permit to Break Ground to be issued before any excavating work commences.
7. Brief plant operators and banksman of the overhead service, no work is to be carried out below overhead services.

Trial hole

8. Topsoil to be stripped using an excavator and toothless bucket, placed in a stockpile to one side of trial hole.
9. Excavate down to level, trial hole no 1 down to 2.5m, trial no 2 down to 2.5m, trial hole no 3 down to 5m.
10. Excavated material to be stockpiled to the side of the trial hole.
11. Once inspections carried out and photos have been taken, trial hole can be backfilled. Excavate and backfill one trial hole at a time.
12. AT NO POINT CAN PERSONNEL ENTER THE TRIAL HOLE.
13. Excavations to be backfilled or fenced off at the end of each shift.

15.0 Environmental Arrangements

- Spill kits to be available on site.
- Refuelling of plant will not be required on site

16.0 Inspection & Testing Requirements (quality)

All plant to be inspected as per PUWER and LOLER requirements

17.0 COSHH Assessments

NA

Location Plan – LL55 3ER

18.0 Briefing Record

The undersigned confirm that they have been briefed on the contents of this method statement and the risk assessments attached, and understand the method, hazards and the measures to be taken to control them.

Briefing given by: …… Date : ……..

NAME	SIGNED	NAME	SIGNED

APPENDIX II

Gwynedd Archaeological Trust photographic metadata

File reference	Project name	Project phase	Site sub-division	Description	View from	Scale (s)	Type	Date	Originating person	Originating organisation	Plate
G2492_015	DCWW Dinorwig	Watching Brief		General view of the three trial holes prior to excavation	SSE	1m	Photograph	01/02/17	Robert Evans	GAT	01
G2492_016	DCWW Dinorwig	Watching Brief	Trial hole 1	Working shot of Trial hole 1 excavation: removing topsoil	S	1m	Photograph	01/02/17	Robert Evans	GAT	02
G2492_017	DCWW Dinorwig	Watching Brief	Trial hole 1	West facing section of Trial hole 1 on encountering of glacial horizon at 1.3m	WNW	1m	Photograph	01/02/17	Robert Evans	GAT	03
G2492_018	DCWW Dinorwig	Watching Brief	Trial hole 1	Trial hole 1 in plan	SSW	1m	Photograph	01/02/17	Robert Evans	GAT	
G2492_019	DCWW Dinorwig	Watching Brief	Trial hole 1	General view of Trial hole 1 excavated to 2.1m depth	SSW		Photograph	01/02/17	Robert Evans	GAT	04
G2492_020	DCWW Dinorwig	Watching Brief	Trial hole 1	General view of Trial hole 1 excavated to 4m depth	SSW	1m	Photograph	01/02/17	Robert Evans	GAT	
G2492_021	DCWW Dinorwig	Watching Brief	Trial hole 1	General view of Trial hole 1 during backfilling showing wet clay removed from lower levels	S		Photograph	01/02/17	Robert Evans	GAT	
G2492_022	DCWW Dinorwig	Watching Brief	Trial hole 1	General view of Trial hole 1 during backfilling and location of Trial holes 2 and 3 (yellow posts)	E		Photograph	01/02/17	Robert Evans	GAT	
G2492_023	DCWW Dinorwig	Watching Brief	Trial hole 2	Trial hole 2 at limit of excavation	E	1m	Photograph	01/02/17	Robert Evans	GAT	
G2492_024	DCWW Dinorwig	Watching Brief	Trial hole 2	South-facing section in Trial Hole 2, detailing	S	1m	Photograph	01/02/17	Robert Evans	GAT	05

File reference	Project name	Project phase	Site sub-division	Description	View from	Scale (s)	Type	Date	Originating person	Originating organisation	Plate
				interface between topsoil and glacial horizon							
G2492_025	DCWW Dinorwig	Watching Brief	Trial hole 2	General view of Trial hole 2, angled shot to show depth	SE		Photograph	01/02/17	Robert Evans	GAT	
G2492_026	DCWW Dinorwig	Watching Brief	Trial hole 2	General view of Trial hole 2 at limit of excavation (2.5m)	E		Photograph	01/02/17	Robert Evans	GAT	06
G2492_027	DCWW Dinorwig	Watching Brief	Trial hole 3	Trial hole 3 in plan	E	1m	Photograph	01/02/17	Robert Evans	GAT	
G2492_028	DCWW Dinorwig	Watching Brief	Trial hole 3	South facing section of Trial hole 3 detailing glacial horizon	S	1m	Photograph	01/02/17	Robert Evans	GAT	07
G2492_029	DCWW Dinorwig	Watching Brief	Trial hole 3	Limit of excavation in Trial hole 3	ESE		Photograph	01/02/17	Robert Evans	GAT	08
G2492_030	DCWW Dinorwig	Watching Brief		General shot of ground investigation works	N		Photograph	01/02/17	Robert Evans	GAT	Front cover

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