

Capel Geifr, Capel Carmel,
Aberdaron
Water Main Renewal Scheme
Archaeological Watching Brief



Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

Capel Geifr, Capel Carmel, Aberdaron Water Main Renewal Scheme

Archaeological Watching Brief

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SUMMARY

*Gwynedd Archaeological Trust (GAT) conducted a watching brief during the groundwork for the Caer Geifr, Capel Carmel water main renewal scheme near Aberdaron, Gwynedd (centred on NGR **SH17522824**). A distance of 1.26km of an Asbestos Cement water main was replaced using open cut trenching, pipe bursting and some directional drilling.*

Four sections of the open cut trench were observed and five pits. The route of the new pipe was located closed to several prehistoric archaeological features and findspots and well as the medieval township of Is Sely (PRN 6,580) located 570m south of scheme start point. The archaeological potential was considered low to medium because of the lack of archaeological sites within the immediate area but the undisturbed ground and historic map evidence indicated the potential for historic field boundaries to be located. However, no archaeology was observed within the confines of these works.

1.0 INTRODUCTION

Gwynedd Archaeological Trust (GAT) has been asked by Dwr Cymru carry out an archaeological watching brief during groundworks associated with the Caer Geifr, Capel Carmel water main renewal scheme near Aberdaron, Gwynedd (centred on NGR **SH17522824**).

The groundworks were completed by *GW Williams* over seen by *O'Connors Ltd.* on behalf of *Dŵr Cymru* between 15th April 2014 and the 30th April 2014.

The scheme included the rehabilitation of approximately 1.26km of 4" & 3" Asbestos Cement water main with 125mm Profuse and 63mm Medium-density polyethylene pipe, as detailed on *Dwr Cymru* Drawings NP2900416-101 and NP2900416-102 (reproduced in the project design, see Appendix). The existing main was abandoned on completion of the works.

The scheme involved open cut trenching, directional drilling and pipe bursting.

The watching brief monitored the launch/reception pits associated with the directional drilling and pipe bursting, trial holes to identify the existing mains and open cut trenching.

GAT produced a project design outlining the proposed scheme and archaeological mitigation methodology in April 2014 (see [Appendix I](#)) with recommendations for an intensive watching brief. The project design was subsequently approved by Gwynedd Archaeological Planning Services (email correspondence: 14/04/14).

The guidelines specified in *Standards and Guidance for an Archaeological Watching Brief* (Institute for Archaeologists, 1994, rev. 2001 and 2008) were adhered to throughout the course of the project.

2.0 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

A brief examination of the regional Historic Environment Record (Gwynedd Archaeological Trust, Craig Beuno, Garth Road, Bangor, Gwynedd LL57 2RT) does not identify any known archaeological sites or findspots on the scheme route. Within the local area, the known archaeological sites and findspots include:

- Scheduled Ancient Monument CN045, a prehistoric defensive earthwork (NGR SH18702846), 1.01km northeast of scheme end point;
- Primary Reference Number (PRN) 31,704 - Pont Rhyd y Cei, Aberdaron, a postmedieval bridge (NGR SH17262813), 250 southwest of scheme centre point;
- PRN 2,869 – A prehistoric stone tool findspot (NGR SH18002800), 300m southwest of the scheme endpoint;
- PRN 1826 – Roman Quernstone findspot (NGR SH18272836), 640m northeast of the scheme endpoint;
- PRN 1798 – Bronze Age Barclodiad y Gawres Cairn (NGR SH18402850), 860m northeast of scheme endpoint;
- PRN 6,580 – Is Sely Medieval Township (NGR SH17002800), 570m south of scheme start point;
- Listed Building 20011 - Cae'r Geifr (NGR SH17022858), located to the immediate north of the scheme start point.

An examination of the First to Third Edition 25" Ordnance Survey Maps of the area (Sheets XLXI and XLXII) detail a greater concentration of field systems than are currently visible, with the current large enclosure fields subdivided into smaller parcels on the 1889, 1900 and 1918 maps. It is possible that these historic field enclosures may survive in truncated form below ground and could be encountered during the intrusive groundworks.

3.0 METHODOLOGY

An intensive watching brief was carried out between the 15th April 2012 and the 30th April 2014. A total of five visits were made to the works by GAT on and between these dates. During the visits the groundworks were monitored and recorded.

The WMR scheme included the open cutting of an 810m long section along the northern portion of the route, with a section laid in the grass verge and farm track. At the western and central portion of the scheme directional drilling of two c.20m long sections were completed: the first section was across the Afon Cyllyfelin and the second across a local road.

Pipebursting was used for the final 410m of the water main renewal at the eastern end, crossing two open fields (see figure 01).

A 360° tracked excavator with a toothless bucket was used to initially strip a length of topsoil within the field of the opencut trenching from the north and then commenced the opencut trenching, following the pipe route along its length. The trenches were opened, piped laid and closed within the same day, the topsoil was stored in bunds at the side of the stripped area. The sections of open cut trenches recorded have been labelled A-D and located on figure 01.

Concurrently during the opencut trenching a second groundwork team excavated a number of launch/reception pits (LR) for pipebursting and inspection pits (IP), to locate the existing main. These pits were numbered 1-5 and are located figure 01. A small rubber tracked excavator was used to excavate the pits which were at the south and east end of the scheme.

Field boundary breaches were mostly avoided with the route of the pipe utilising available gateways and employing directional drilling techniques, tunnelling under the field boundaries and the road. A field boundary at the end of section B of the open cut trench was very wet and difficult to reach by the excavator, this boundary was managed and reinstated when the archaeologist was not on site.

The watching brief consisted of the following:

- Observation of non-archaeological excavation works.
- A written and photographic record of any non- archaeological deposits that were revealed. The camera used was a Nikon D40 digital SLR, set to maximum resolution.
- Preparation of full archive report under project number **G2376**

4.0 TOPOGRAPHY

The groundwork took place in agricultural fields given over to pasture. At the north end the ground sloped to the south and plateaued at the end of the open cut trenching section. Across the road junction to the pipe bursting section of the scheme the fields in the south and sloped up the north quite steeply.

The basalt igneous bedrock was formed approximately 635 million years ago from mobile magma, low in silica which had erupted from squat volcanoes and fissures. The superficial (upper deposits) were formed only 2 million years ago with ice age glaciers scouring the landscape and depositing till with outwash sand and gravel deposits from the glacial meltwaters (www.bgs.ac.uk).

5.0 RESULTS

5.1 Open cut trenching (OC)

Approximately 810m of opencut trenches were dug from the northern end of the scheme heading south then west. An easement of 3.00m of topsoil was stripped which preceded the opencut trenching (Figure 01 for locations)

OC (A) (Plate 01)

A 'T' shaped area of pipe trench, 150m in length, average of 0.70m wide and 0.90m in depth. The stratigraphy along this section was uniform throughout with 0.20m of dark orange brown silt clay topsoil with occasional small to medium sub-rounded and sub-angular stones. The topsoil sat directly on a glacial horizon of mid orange brown clay with rare sub-rounded stone inclusions which measured 0.70m deep to the base of the pipe trench. No archaeological activity was identified within the confines of the trench.

OC (B) (Plate 02)

A 16m length of open cut pipe trench measuring 0.70m wide and 0.80m in depth. The stratigraphy along this section was uniform throughout with 0.20m of dark orange brown silt clay topsoil with occasional small to medium sub-rounded and sub-angular stones. The topsoil sat directly on a glacial horizon of mid orange brown clay with rare sub-rounded stone inclusions which measured 0.60m deep to the base of the pipe trench. No archaeological activity was identified within the confines of the trench.

OC (C) (Plates 03 and 04)

Approximately 30m length of trench was excavated, partially dug into the verge of the trackway. The trench also cut the trackway and measured 0.78m deep and 0.70m wide, an old field drain running east to west cut across the trench at the southern end. The trench cut through a thin layer of hardcore standing laid for the trackway, 0.06m in depth, with the glacial horizon directly below this. The glacial horizon was a deposit of mid brown yellow clay with rare medium sub-angular stone inclusions. No archaeological activity was identified within the confines of the trench.

OC (D) (Plate 05)

A length of 5m of trench, measuring 0.70m wide and 0.90m in depth. The topsoil was a dark orange brown silt clay measuring 0.10m deep and was directly on the glacial horizon, which was mid brown yellow clay. No archaeological activity was identified within the confines of the trench.

5.2 Launch/Reception pits and inspection pits

See figure 01 the approximate locations of the pits.

Pit (01) (Plate 06)

This pit measured 2.0m in length 0.70m wide and 1.0m deep and ran WNW-ESE. The topsoil was mid yellow brown clay above glacial horizon of mid brown yellow silt clay, with occasional sub-angular stone inclusions. No archaeological activity was identified within the confines of the pit.

Pit (02) (Plate 07)

A 'P' Shaped pit measuring 2.5m by 1.5m and 0.92m in depth. The topsoil was a mid yellow brown clay silt with small sub-rounded stone inclusions and measured 0.35m in depth. The glacial horizon was a mid brown yellow silt clay, with occasional sub-angular stone inclusions. No archaeological activity was identified within the confines of the pit.

Pit (03) (Plate 08)

Pit dug to locate the existing pipe. The pit measured 2.5m by 0.90m and 1.30m deep. The topsoil was yellow brown clay silt measuring 0.30m deep. The glacial horizon directly below the topsoil and was a brown yellow clay. Within this pit the cut and fill of the existing pipe trench was identified and consisted of a mixed redeposited natural deposit with mottled brown yellow clay silt/silt clay. No archaeological activity was identified within the confines of the pit.

Pit (04) (Plate 09)

Pit dug to locate the existing pipe. The pit measured 2.0m by 0.90m and 0.85m deep. The topsoil was yellow brown clay silt measuring 0.40m deep. The glacial horizon directly below the topsoil and was a brown yellow clay. Within this pit the cut and fill of the existing pipe trench was identified and consisted of a mixed redeposited natural deposit with mottled brown yellow clay silt/silt clay. No archaeological activity was identified within the confines of the pit.

Pit (05) (Plate 10)

An 'L' shaped pit in the road. The pit measured 2.0m by 0.80m and 0.85m deep. There was 0.10m of road surface, concrete with 0.15m of road and made ground for the road foundation, below that was 0.60m of yellow grey clay. No archaeological activity was identified within the confines of the pit.

6.0 INTERPRETATION AND CONCLUSION

The watching brief monitored a total of five pits and four sections of open cut trenching, along the scheme route. There was very little change in the stratigraphy throughout the scheme, with all the monitored areas having a silt clay topsoil directly on a clay glacial horizon; no subsoil was observed.

The close proximity of known archaeological sites and findspots, indicated a potential for archaeological activity within the scheme. However, there was no evidence within the monitored areas of prehistoric or Roman activity. In addition, there was no evidence of the possible historic field enclosures noted on the First to Third Edition 25" Ordnance Survey Maps of the area (Sheets XLXI and XLXII).

The monitored pits were small, and excavated over the original water main, therefore identifying ground which had previously been disturbed, with only a small area of ground to either side of the pipe excavated in new ground, which limited the possibility of discovering any archaeology. The open cut trenches were excavated in undisturbed ground, which have the potential to contain archaeological features; however, the trenches were quite narrow.

No archaeology was observed in the limits of these works in either open cut trench or the pits, however there still remains the potential for archaeology within the wider area.

7.0 SOURCES CONSULTED

Client drawings: *Dŵr Cymru* drawing No. NP2900416101 and NP2900416-102.

Gwynedd Archaeological Trust: Historic Environment Record

Standard and Guidance for Archaeological Watching Brief (Institute For Archaeologists, 1994, rev.2001 & 2008)

British Geological Survey: www.bgs.ac.uk

Ordnance Survey 1 mile to 25 inch First Edition County Series Caernarvonshire Sheet XLXI and XLXII (1889)

Ordnance Survey 1 mile to 25 inch Second Edition County Series Caernarvonshire Sheet XLXI and XLXII (1900)

Ordnance Survey 1 mile to 25 inch Third Edition County Series Caernarvonshire Sheet XLXI and XLXII (1919)

APPENDIX I

**Reproduction of Gwynedd Archaeological Trust project design,
Capel Geifr, Capel Carmel, Aberdaron**

CAPEL GEIFR, CAPEL CARMEL, ABERDARON

PROJECT DESIGN FOR ARCHAEOLOGICAL
WATCHING BRIEF (G2376)

Prepared for

Dwr Cymru

April 2014

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

**CAPEL GEIFR, CAPEL CARMEL, ABERDARON
ARCHAEOLOGICAL WATCHING BRIEF**

Prepared for *Dwr Cymru*, April 2014

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1.0 INTRODUCTION

Gwynedd Archaeological Trust (GAT) has been asked by *Dwr Cymru* to provide a project design for undertaking an archaeological watching brief during groundworks associated with the Caer Geifr, Capel Carmel water main renewal scheme near Aberdaron, Gwynedd (centred on NGR **SH17522824**). The scheme includes the rehabilitation of approximately 1.26km of 4" & 3" Asbestos Cement water main with 125mm Profuse and 63mm Medium-density polyethylene pipe, as detailed on *Dwr Cymru* Drawings NP2900416-101 and NP2900416-102 (reproduced as Figures 01 and 02 respectively). The existing main will be abandoned on completion of the works.

According to *Dwr Cymru* Drawings NP2900416-101 and NP2900416-102 the scheme was to include directional drilling (red line on the scheme drawings, pipebursting (new wider pipe sent through the older narrower pipe; coloured pink on the scheme drawings) and open cutting (a dashed red line on the scheme drawings). Based on feedback from *O'Connor Utilities Limited* who are working on the scheme, the directional drilling will be replaced by open cutting due to wet ground and the open cutting sections marked on the plan will be replaced by directional drilling; the pipebursting at the eastern end of the scheme will be retained. Based on this feedback, the scheme will now involve:

- Open cutting of an 810m long section of the water main renewal, at the western and central portion of the scheme;
- Directional drilling of two c.20m long sections towards the centre of the scheme, the first section is across the Afon Cyllyfelin, the second across a local road;
- Pipebursting of the final 410m of the water main renewal at the eastern end of the scheme, crossing two open fields.

Whilst the proposals on *Dwr Cymru* Drawings NP2900416-101 and NP2900416-102 have been partly changed, the drawings still apply in terms of the scheme route.

The watching brief will monitor the following:

- Any launch/reception pits associated with the directional drilling and pipebursting;
- All open cut trenching;
- Any trial holes to identify the existing mains;
- Any other intrusive groundworks not listed on *Dwr Cymru* Drawings NP2900416-101 and NP2900416-102.

The works are scheduled during April and May 2014.

The scheme will be monitored by the Gwynedd Archaeological Planning Services and the content of this design must be approved by the GAPS Archaeologist prior to the start of the intensive watching brief.

Reference will be made to the guidelines specified in *Standard and Guidance for Archaeological Watching Brief* (Institute for Archaeologists 2008).

2.0 ARCHAEOLOGICAL BACKGROUND

A brief examination of the regional Historic Environment Record (Gwynedd Archaeological Trust, Craig Beuno, Garth Road, Bangor, Gwynedd LL57 2RT) does not identify any known archaeological sites or findspots on the scheme route. Within the local area, the known archaeological sites and findspots include:

- Scheduled Ancient Monument CN045, a prehistoric defensive earthwork (NGR SH18702846), 1.01km northeast of scheme end point;
- Primary Reference Number (PRN) 31,704 - Pont Rhyd y Cei, Aberdaron, a post-medieval bridge (NGR SH17262813), 250 southwest of scheme centre point;
- PRN 2,869 – A prehistoric stone tool findspot (NGR SH18002800), 300m southwest of the scheme endpoint;
- PRN 1826 – Roman Quernstone findspot (NGR SH18272836), 640m northeast of the scheme endpoint;
- PRN 1798 – Bronze Age Barclodiad y Gawres Cairn (NGR SH18402850), 860m northeast of scheme endpoint;
- PRN 6,580 – Is Sely Medieval Township (NGR SH17002800), 570m south of scheme start point;
- Listed Building 20011 - Cae'r Geifr (NGR SH17022858), located to the immediate north of the scheme start point.

An examination of the First to Third Edition 25" Ordnance Survey Maps of the area (Sheets XLXI and XLXII) detail a greater concentration of field systems than are currently visible, with the current large enclosure fields subdivided into smaller parcels on the 1889, 1900 and 1918 maps. It is possible that these historic field enclosures may survive in truncated form below ground and could be encountered during the intrusive groundworks.

3.0 METHOD STATEMENT

3.1 Introduction

(Reproduced from Institute for Archaeologists 2008, *Standard and Guidance for an Archaeological Watching Brief*)

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

This definition and Standard do not cover chance observations, which should lead to an appropriate archaeological project being designed and implemented, nor do they apply to monitoring for preservation of remains in situ.

An archaeological watching brief is divided into four categories according to the Institute for Archaeologists *Standard and Guidance for an archaeological watching brief*:

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

A **partial** watching brief is listed on *Dwr Cymru* Drawing NP2900416-101 as being the requirement for this scheme.

The **watching brief** will consist of the following:

- Observation of non-archaeological excavation works.
- A drawn, written and photographic record of any archaeological structures and deposits that may be revealed.
- Preparation of full archive report.

The watching brief will monitor:

- Any launch/reception pits associated with the directional drilling and pipebursting;
- All open cut trenching;
- Any trial holes to identify the existing mains;
- Any other intrusive groundworks not listed on *Dwr Cymru* Drawings NP2900416-101 and NP2900416-102.

3.2 Basic watching brief and archaeological excavation methodological procedures

3.2.1 Watching Brief and Excavation

All attendances and identified features will be recorded using GAT pro-formas and photographed using a digital SLR camera set to JPEG FINE format. The extent of any identified archaeological activity and any features therein will be located using survey grade (not handheld) GPS with <10cm accuracy (model: *Trimble GNSS/R6/5800*).

All features encountered will be manually cleaned and examined to determine extent, function, date and relationship to adjacent features. Limited excavation will be undertaken to characterise the features; any subsequent excavation will be detailed in an appropriate Further Archaeological Works Design.

Where appropriate, samples for specialist analyses will be taken.

3.2.2 Environmental Samples

If encountered, relevant archaeological deposits will be sampled by taking bulk samples for flotation of charred plant remains. Bulk samples will be taken from waterlogged deposits for macroscopic plant remains. Other bulk samples, for example from middens, may be taken for small animal bones and small artefacts.

3.2.3 Human Remains

If encountered, human remains will be left *in-situ*, covered and protected, and both the coroner and the GAPS Archaeologist informed. If removal is necessary it will take place under appropriate regulations and with due regard for health and safety issues. In order to excavate human remains, a 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. This will be applied for should human remains need to be investigated or moved.

3.2.4 Small Finds

The vast majority of finds recovered from archaeological excavations comprise pottery fragments, bone, environmental and charcoal samples, and non-valuable metal items such as nails. Often many of these finds become unstable (i.e. they begin to disintegrate) when removed from the ground. All finds are the property of the landowner, however, it is Trust policy to recommend that all finds are donated to an appropriate museum 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. All finds would be treated according to advice provided within *First Aid for Finds* (Rescue 1999). 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 and ARCUS at Sheffield.

Unexpected Discoveries: Treasure Trove

Treasure Trove law has been amended by the Treasure Act 1996. The following are Treasure under the Act:

- *Objects other than coins* any object other than a coin provided that it contains at least 10% gold or silver and is at least 300 years old when found.
- *Coins* all coins from the same find provided they are at least 300 years old when

found (if the coins contain less than 10% gold or silver there must be at least 10. Any object or coin is part of the same find as another object or coin, if it is found in the same place as, or had previously been left together with, the other object. Finds may have become scattered since they were originally deposited in the ground. Single coin finds of gold or silver are not classed as treasure under the 1996 Treasure Act.

- *Associated objects* any object whatever it is made of, that is found in the same place as, or that had previously been together with, another object that is treasure.
- *Objects that would have been treasure trove* any object that would previously have been treasure trove, but does not fall within the specific categories given above. These objects have to be made substantially of gold or silver, they have to be buried with the intention of recovery and their owner or his heirs cannot be traced.

The following types of finds are not treasure:

- Objects whose owners can be traced.
- Unworked natural objects, including human and animal remains, even if they are found in association with treasure.
- Objects from the foreshore which are not wreck.

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.

3.3 Further Archaeological Works

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

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 establishment of a threshold of significance over which a FAWD might be triggered. This will include any features of demonstrable or likely prehistoric to medieval date and, for post-medieval features, any complex or unusual remains, including industrial activity. 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 the GAPS Archaeologist.

This design does not include a methodology or cost for examination of, conservation of, or archiving of finds discovered during the watching brief, nor of any radiocarbon dates required, nor of examination of palaeoenvironmental samples. The need for

these will be identified in the post-fieldwork programme (if required), and a new design will be issued for approval by the GAPS Archaeologist.

3.4 Monitoring Arrangements

The GAPS Archaeologist will need to be informed of all start dates for the various elements of the scheme listed and of the subsequent progress and findings and enable discussion about the need or otherwise for FAWDs if features of potential archaeological significance are encountered.

3.5 Processing data, illustration, report and archiving

The level of post-excavation analysis and reporting for the purposes of the mitigation will be sufficient to establish the character, scale, date range, artefactual and palaeo-environmental potential and overall significance of the remains and will be based on the *Management of Archaeological Projects* (English Heritage, 1991).

Following the completion of the fieldwork, the data will be processed, final illustrations will be compiled and a report will be produced which will detail and synthesise the results. Location drawings and a sample of relevant photographs will be used to illustrate the reports.

4.0 POST-EXCAVATION PHASE

4.1 Introduction

If required, the management of the post-excavation phase will follow guidelines specified in *Management of Archaeological Projects* (English Heritage, 1991), and relevant guidelines from *Management of Research Projects in the Historic Environment* (English Heritage 2006). Five stages are specified:

- Phase 1: project planning
- Phase 2: fieldwork
- Phase 3: assessment of potential for analysis
- Phase 4: analysis and report preparation
- Phase 5: dissemination

The post-excavation stage for the project will include phases 3 to 5.

Phase 3 involves an objective assessment of the results of the fieldwork phases (Phases 1 and 2) in order to ascertain the appropriate level of post-excavation analysis and reporting. This phase culminates in the production of a post-excavation assessment report. The second involves carrying out the work identified within the post-excavation assessment report, and culminates in a final report and project archive (Phases 4 and 5).

4.2 Post-excavation assessment

The level of post-excavation analysis and reporting for the purposes of the mitigation will be sufficient to establish the character, scale, date range, artefactual and palaeo-environmental potential and overall significance of the remains.

Style and format of the report will include as a minimum the following:

- A location plan
- Plans and sections of features located at an appropriate scale
- A section drawing showing depth of deposits including the present ground level with Ordnance Datum, vertical and horizontal scale.
- A summary statement of the results.
- A table summarising per trench the features, classes and numbers of artefacts contained within, spot dating of significant finds and an interpretation.
- An interpretation of the archaeological findings both within the site and within their wider landscape setting.

Artefact analysis will be sufficient to establish date ranges of archaeological deposits, a general assessment of the types of pottery and other artefacts to assist in characterising the archaeology, and to establish the potential for all categories of artefacts should further archaeological work be necessary.

4.3 Analysis and report preparation

The work undertaken during this phase of the project will be carried out according to the recommendations contained within the post-excavation assessment report.

4.4 Production of site archive

A full archive including plans, photographs, written material and any other material resulting from the project will be prepared. All plans, photographs and descriptions will be labelled and cross-referenced, and lodged in an appropriate place (to be decided in consultation with the regional Historic Environment Record) within six months of the completion of the fieldwork that is currently scheduled between April and May 2014. All digital data will be written to optical media and stored with the paper archive.

- A digital report and archive on optical disc will be provided to the GAPS Archaeologist;
- A digital report and archive on optical disc will be provided to Historic Environment Record, Gwynedd Archaeological Trust; this will be submitted within six months of report completion
- A digital report and archive on optical disc will be provided to Royal Commission on Ancient and Historic Monuments, Wales.
- A paper report(s) plus digital report(s) will be provided to the client

5.0 PERSONNEL

The work will be managed by John Roberts, Principal Archaeologist GAT Contracts Section. The work will be undertaken by one of the Trust's Archaeologists experienced in the relevant skills/periods required. Full details of personnel involved, with *curricula vitae*, can be supplied upon request.

6.0 HEALTH AND SAFETY

The Trust subscribes to the SCAUM (Standing Conference of Archaeological Unit Managers) Health and Safety Policy as defined in **Health and Safety in Field Archaeology** (2006). Risks will be assessed prior to and during the work.

7.0 INSURANCE

Liability Insurance - Aviva Policy 24765101CHC/00045

- Employers' Liability: Limit of Indemnity £10m in any one occurrence
- Public Liability: Limit of Indemnity £5m in any one occurrence
- Hire-in Plant Insurance: £50,000.00 any one item;
£250,000.00 any one claim

The current period expires 21/06/14

Professional Indemnity Insurance – RSA Insurance Plc P8531NAECE/1028

- Limit of Indemnity £5,000,000 any one claim

The current period expires 22/07/14

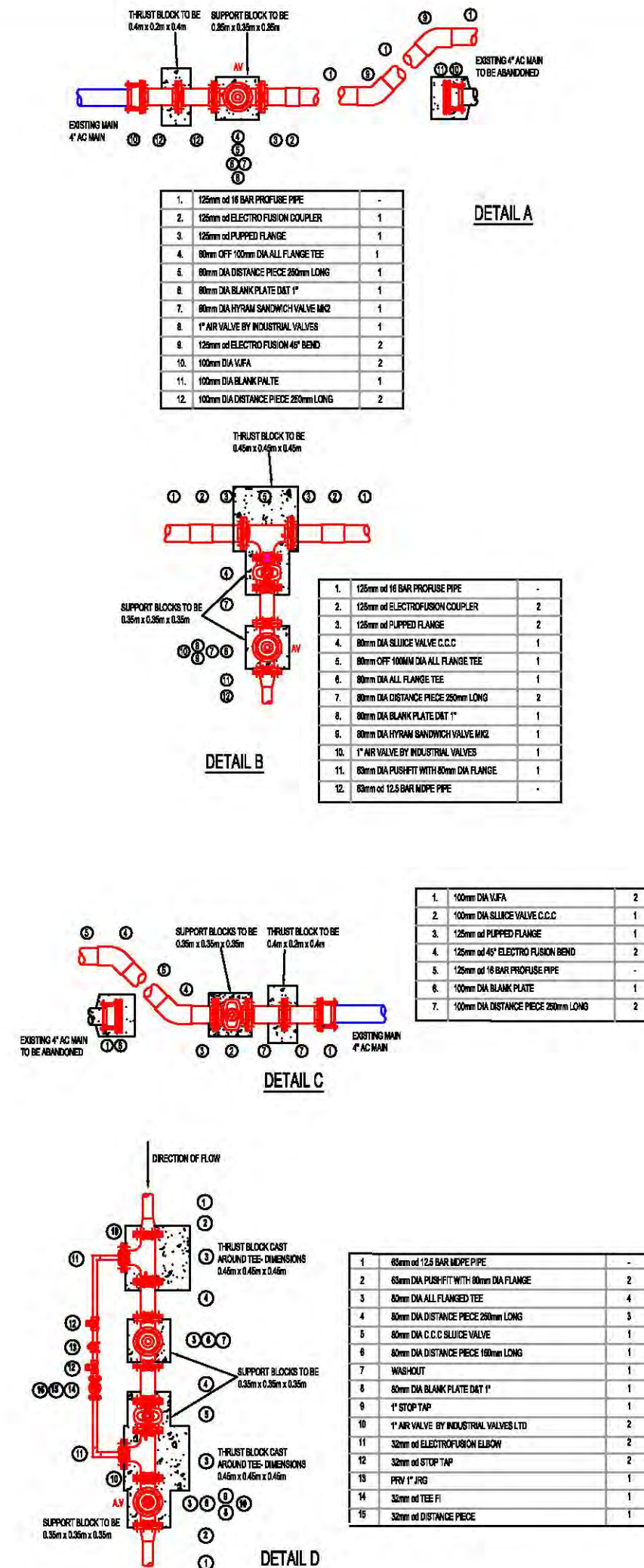
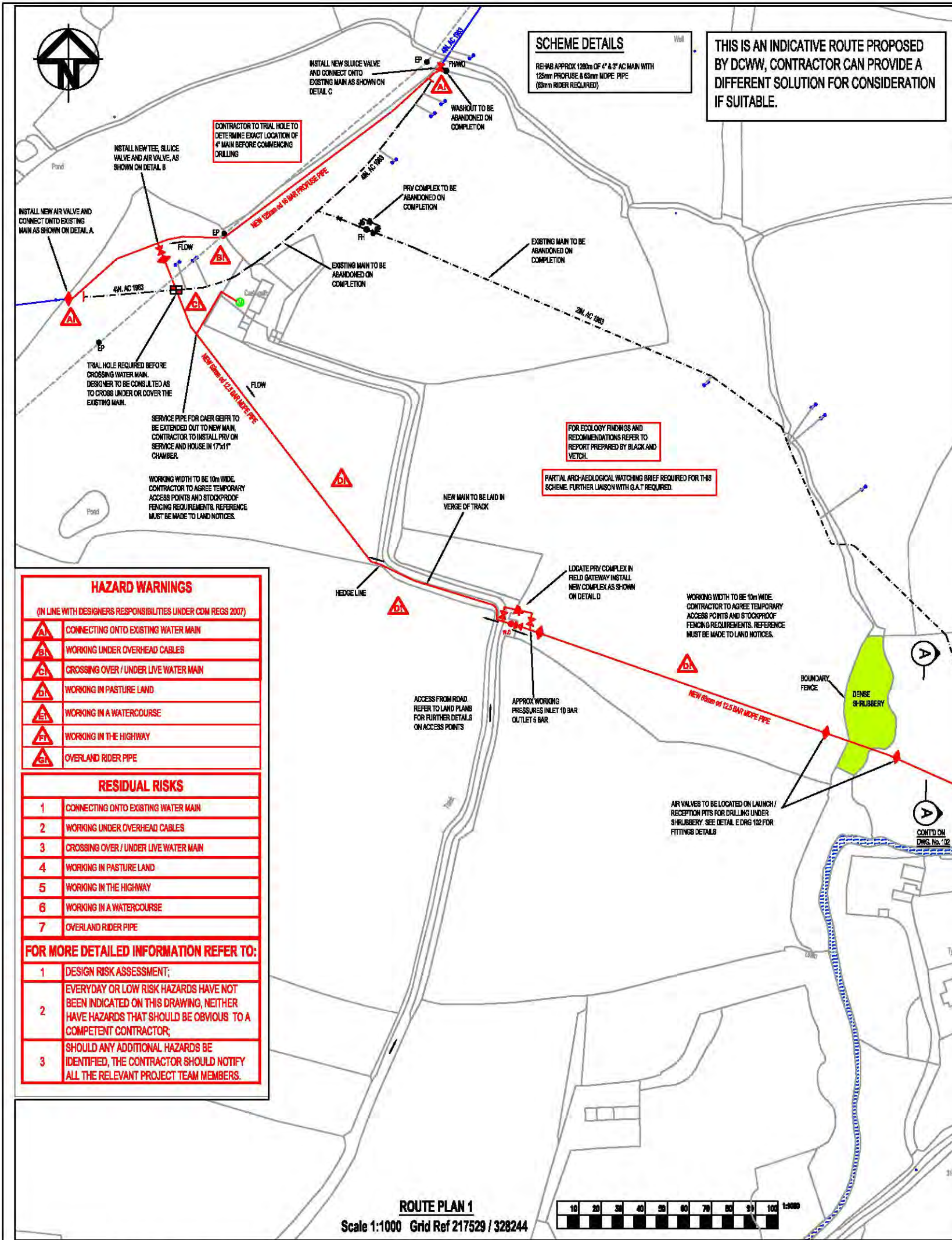
8.0 SOURCES CONSULTED

Dwr Cymru Drawings NP2900416-101 and NP2900416-102

Standard and Guidance for Archaeological Watching Brief (Institute for Archaeologists, 1994, rev. 2001 & 2008)

Figure 1

Reproduction of Dwr Cymru Drawing NP2900416-101



A1

NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE FOLLOWING DOWN SPECIFICATIONS:
- THE CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY REVISION 8 (CESW 8)
- ALL FLANGES TO BE NP18 RATED
- ALL PROFUSE PIPE AND FITTINGS TO BE SDR11 - 16 BAR RATED
- ALL MOPE PIPES AND FITTINGS TO BE 12.5 BAR RATED
- REFER TO DRAWING TDH1 FOR THE FOLLOWING DETAILS:
FIRE HYDRANT, AIR VALVE, SLUIE VALVE AND PRV CHAMBER DETAILS
TIMBER POST STOCK PROOF FENCE DETAIL
INDICATOR AND MARKER POST DETAIL
TYPICAL THRUST BLOCK DETAILS
- TRENCH DETAILS / REINSTATEMENT TO BE AS DRAWING TD102 FOR WORK IN GRASSLAND, UNMADE TRACK, ROAD VERGE AND HIGHWAY
- THE EXISTING MAIN IS TO BE ABANDONED ON COMPLETION OF THE WORKS BY CAPPING OFF WITH FLANGE ADAPTORS AND BLANK FLANGES. ALL EXISTING VALVES, HYDRANTS ETC ON ABANDONED MAINS ARE TO BE BURIED. ALL CHAMBER COVERS / FRAMES REMOVED AND ALL AFFECTED AREAS REINSTATE
- NO HEDGEROWS ARE TO BE REMOVED ON THIS PROJECT. IF HEDGEROW REMOVAL IS FOUND TO BE UNAVOIDABLE, THE CONTRACTOR IS TO CONTACT THE DESIGNER IN ADVANCE FOR FURTHER GUIDANCE. ALSO, DISTURBANCE TO HEDGEROWS IS TO BE AVOIDED DURING THE BIRD NESTING SEASON OF MARCH TO JULY
- ALL OPEN EXCAVATIONS ARE TO BE SECURED BY TIMER POST STOCK PROOF FENCING AS SHOWN ON DRAWING TD101 OR APPROPRIATELY FIXED "HERAS" FENCING
- THE DEPTH AND LINE OF THE NEW MAIN IS TO BE SUPPLIED BY THE CONTRACTOR AT 5m INTERVALS FOR ALL DIRECTIONAL DRILLING WORK. ALL NEW DIRECTIONAL DRILL MAINS TO BE INSTALLED A MINIMUM DISTANCE OF 3 METRES FROM THE EXISTING WATER MAINS.
- SERVICE TRANSFERS: THE CONTRACTOR IS TO ALLOW FOR THE TRANSFER OF ALL SERVICE CONNECTIONS FROM THE EXISTING MAINS TO THE PROPOSED MAIN. NEW MAINS TO BE 20mm MOPE, TO BE INSTALLED BY OPEN CUT, MOUND OR SLIP LINING AS APPROPRIATE. ESTIMATED NUMBER OF RESIDENTIAL TRANSFERS - 10. LOCATION OF CONNECTIONS TO BE DETERMINED BY THE CONTRACTOR ON SITE. CAUTION - CABLES OVERHEAD CABLES ARE PRESENT WITHIN THE WORKING AREA. CONTRACTOR TO REFER TO HSE GUIDANCE NOTE G88 "AVOIDANCE OF DANGER FROM OVERHEAD LINES". UNDERGROUND CABLES ARE ALSO PRESENT ON SITE. CONTRACTOR TO CONSULT UTILITY DRAWINGS AND IDENTIFY ALL UNDERGROUND SERVICES PRIOR TO COMMENCEMENT OF WORK
- THE POSITIONING OF THE MAIN IS TO BE IN ACCORDANCE WITH THE NATIONAL JOINT UTILITIES GROUP GUIDELINES (JUG 07)
- WORKING PRESSURE ON THIS PROJECT IS 10 BAR (5 BAR ON OUTLET OF PRV). TEST PRESSURE IS 16 (12.5 BAR) AT THE LOWEST POINT
- ALL WORK IN PRIVATE LAND IS TO BE CARRIED OUT IN ACCORDANCE WITH DOWN'S CODE OF PRACTICE FOR REREPLYING
- CAUTION - NO CHLORINATED / CONTAMINATED WATER OR DRILLING FLUIDS ARE ALLOWED TO ENTER ANY WATER COURSE OR STORM DRAIN. CONTRACTOR TO REFER TO GUIDELINES ON POLLUTION PREVENTION AND INSTRUCTIONS IN CASE OF EMERGENCY
- THIS DRAWING NEEDS TO BE READ IN CONJUNCTION WITH THE UTILITY INFORMATION PROVIDED SEPARATELY BY THE INDIVIDUAL UNDERTAKERS. TRIAL HOLES MAY BE REQUIRED TO ESTABLISH EXACT LOCATION OF UTILITIES
- DETAILS ARE GUIDES ONLY. ALL PIPES, FITTINGS AND ASSOCIATED MATERIALS TO COMPLETE THE JOB ARE TO BE PROVIDED BY CONTRACTOR

KEY:

- Existing water main
- Abandoned water main
- Water main to be abandoned
- Proposed water main - Open cut
- Proposed water main - Directional Drill
- Proposed water main - Pipeliner
- Proposed water main - Slip lining
- Existing Communication Pipe
- Proposed Communication Pipe
- Contractors Access
- Trial Hole Position
- SSR, Scheduled Ancient Monument
- Contaminated Land
- Great Ouseford Road Restrictions
- Archaeological Restrictions
- Redger this
- Mile Shale

SAP ID ***** POST CODE LL53 8AH

B	14.10.13	JH	TENDER ISSUE	MK	HL	4.10.13
A	01.06.13	JH	PRELIMINARY ISSUE	MK	MK	01.06.13
Rev.	Date.	Drawn.	Description.	Checked.	Approved.	Date.

Drawing Status: **TENDER ISSUE**

Dŵr Cymru Welsh Water

CAPITAL DELIVERY TEAM
ONE TALBOT GATEWAY
BAGLAN ENERGY PARK
SEAWAY PARADE
BAGLAN
PORT TALBOT
SA12 7BR
Tel: +44 (0) 1639 816600
Fax: +44 (0) 1639 816944

Scheme: **AMP 5 YEAR 4, MIPC
NORTH AREA 7
CAER GEIFR, CAPEL CARMEL, ABERDARON
WATER MAIN RENEWAL**

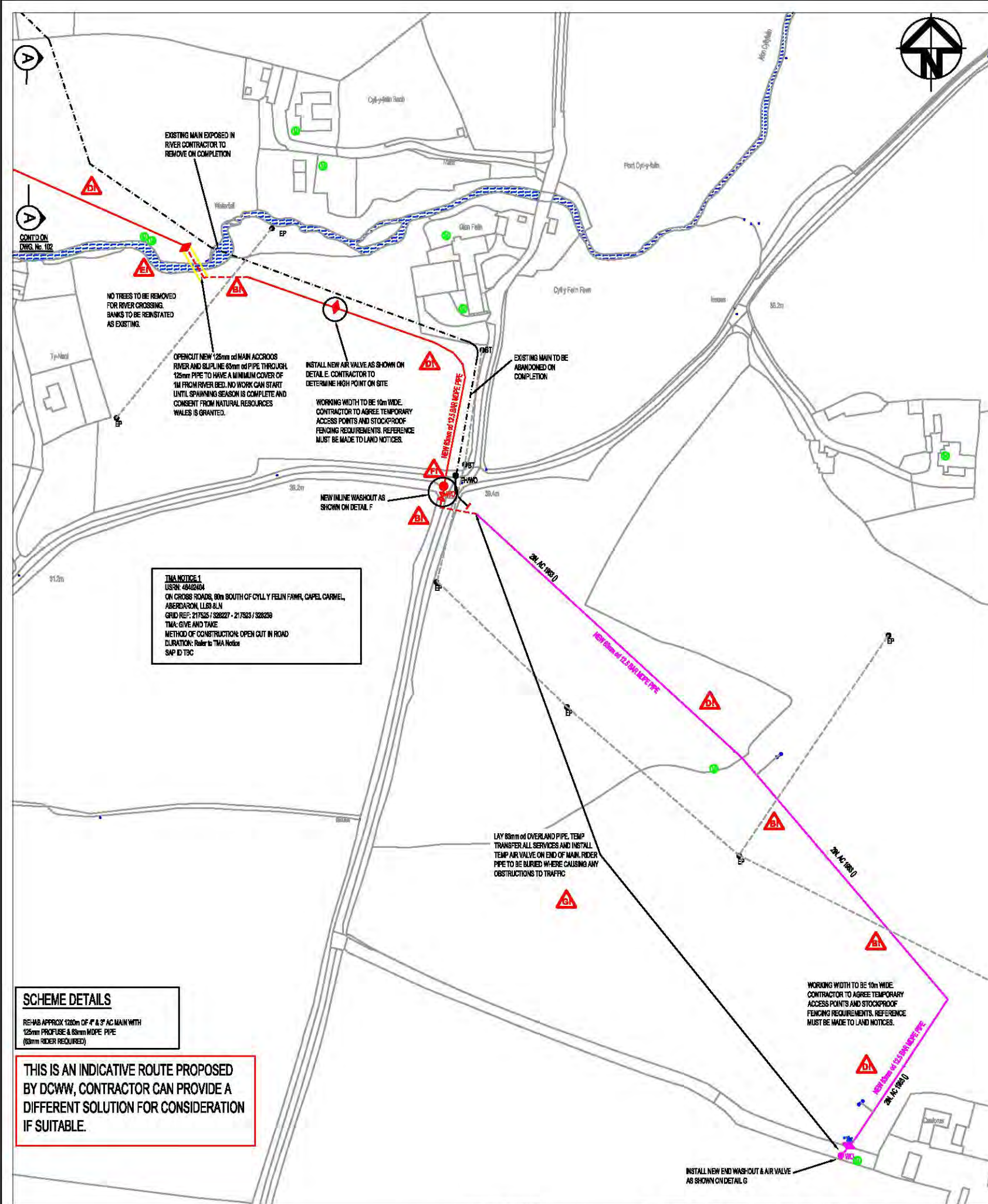
Drawing Title: **ROUTE PLAN & MISC DETAILS**

Scale:	AS SHOWN	Designer:	J HOUSTON
Checked:		Approved:	
Date:		Date:	OCT 13
Drawing Number:	NP2900416 - 101	Rev.	B

REPRODUCED FROM THE ORDNANCE SURVEY MAP WITH THE SANCTION OF THE CONTROLLER OF HER MAJESTY'S STATIONERY OFFICE. CROWN COPYRIGHT RESERVED.

Figure 2

Reproduction of Dwr Cymru Drawing NP2900416-102

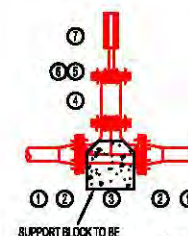
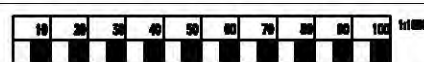


SCHEME DETAILS

REINFORCED APPROX 1250mm OF 125mm OD MAIN WITH 125mm PRODUCE & 80mm MOPE PIPE (80mm RIDER REQUIRED)

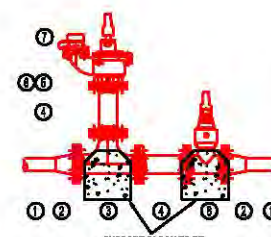
THIS IS AN INDICATIVE ROUTE PROPOSED BY DCWW. CONTRACTOR CAN PROVIDE A DIFFERENT SOLUTION FOR CONSIDERATION IF SUITABLE.

ROUTE PLAN 2
Scale 1:1000 Grid Ref 217529 / 328244



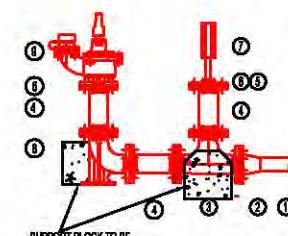
DETAIL E x3

1	80mm od MOPE 12.5 BAR PIPE	-
2	80mm od PUSHFIT WITH 80mm FLANGE	2
3	80mm DIA ALL FLANGED TEE	1
4	80mm DIA DISTANCE PIECE 250mm LONG	1
5	80mm DIA BLANK PLATE D&T	1
6	80mm DIA HYDRAM SANDWICH VALVE MK2	1
7	1" AIR VALVE BY INDUSTRIAL VALVES	1



DETAIL F

1	80mm od MOPE 12.5 BAR PIPE	-
2	80mm od PUSHFIT WITH 80mm FLANGE	2
3	80mm DIA ALL FLANGED TEE	1
4	80mm DIA DISTANCE PIECE 250mm LONG	2
5	80mm DIA BLANK PLATE D&T	1
6	80mm DIA HYDRAM SANDWICH VALVE MK2	1
7	WASH-OUT	1
8	80mm DIA SLUICE VALVE C.C.C	1



DETAIL G

1	80mm od MOPE 12.5 BAR PIPE	-
2	80mm od PUSHFIT WITH 80mm FLANGE	1
3	80mm DIA ALL FLANGED TEE	1
4	80mm DIA A.F. DISTANCE PIECE 250mm LONG	3
5	80mm DIA BLANK PLATE	1
6	80mm DIA HYDRAM SANDWICH VALVE MK2	2
7	AIR VALVE BY INDUSTRIAL VALVES	1
8	80mm DIA DUCKFOOT BEND	1
9	WASH-OUT / FIRE HYDRANT	1

HAZARD WARNINGS	
(IN LINE WITH DESIGNER'S RESPONSIBILITIES UNDER CON RESG 2007)	
1	CONNECTING ONTO EXISTING WATER MAIN
2	WORKING UNDER OVERHEAD CABLES
3	CROSSING OVER / UNDER LIVE WATER MAIN
4	WORKING IN PASTURE LAND
5	WORKING IN A WATERCOURSE
6	WORKING IN THE HIGHWAY
7	OVERLAND RIDER PIPE
RESIDUAL RISKS	
1	CONNECTING ONTO EXISTING WATER MAIN
2	WORKING UNDER OVERHEAD CABLES
3	CROSSING OVER / UNDER LIVE WATER MAIN
4	WORKING IN PASTURE LAND
5	WORKING IN THE HIGHWAY
6	WORKING IN A WATERCOURSE
7	OVERLAND RIDER PIPE
FOR MORE DETAILED INFORMATION REFER TO:	
1	DESIGN RISK ASSESSMENT;
2	EVERYDAY OR LOW RISK HAZARDS HAVE NOT BEEN INDICATED ON THIS DRAWING. NEITHER HAVE HAZARDS THAT SHOULD BE OBVIOUS TO A COMPETENT CONTRACTOR.
3	SHOULD ANY ADDITIONAL HAZARDS BE IDENTIFIED, THE CONTRACTOR SHOULD NOTIFY ALL THE RELEVANT PROJECT TEAM MEMBERS.

A1

NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE FOLLOWING DOWN SPECIFICATIONS:
- THE CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY REVISION 8 (CESM 8)
- ALL FLANGES TO BE NP16 RATED
- ALL PRODUCE PIPE AND FITTINGS TO BE SDR11 - 18 BAR RATED
- ALL MOPE PIPES AND FITTINGS TO BE 12.5 BAR RATED.
- REFER TO DRAWING TD/01 FOR THE FOLLOWING DETAILS:
FIRE HYDRANT, AIR VALVE, SLUICE VALVE AND PIVY CHAMBER DETAILS
TIMBER POST STOCKPROOF FENCE DETAIL
INDICATOR AND MARKER POST DETAIL
TYPICAL THRUST BLOCK DETAILS
- TRENCH DETAILS / REINSTATEMENT TO BE AS DRAWING TD/02 FOR WORK IN GRASSLAND, UNMADE TRACK, ROAD VERGE AND HIGHWAY
- THE EXISTING MAIN IS TO BE ABANDONED ON COMPLETION OF THE WORKS BY CAPPING OFF WITH FLANGE ADAPTORS AND BLANK FLANGES. ALL EXISTING VALVES, HYDRANTS ETC ON ABANDONED MAINS ARE TO BE BURIED. ALL CHAMBER COVERS / FRAMES REMOVED AND ALL AFFECTED AREAS REINSTATE
- NO HEDGEROWS ARE TO BE REMOVED ON THIS PROJECT. IF HEDGEROW REMOVAL IS FOUND TO BE UNAVOIDABLE, THE CONTRACTOR IS TO CONTACT THE DESIGNER IN ADVANCE FOR FURTHER GUIDANCE. ALSO, DISTURBANCE TO HEDGEROWS IS TO BE AVOIDED DURING THE BIRD NESTING SEASON OF MARCH TO JULY.
- ALL OPEN EXCAVATIONS ARE TO BE SECURED BY 'TIMBER POST' STOCKPROOF FENCING AS SHOWN ON DRAWING TD/01 OR APPROPRIATELY FIXED 'HERAS' FENCING.
- THE DEPTH AND LINE OF THE NEW MAIN IS TO BE SUPPLIED BY THE CONTRACTOR AT 50m INTERVALS FOR ALL DIRECTIONAL DRILLING WORK. ALL NEW DIRECTIONAL DRILL MAINS TO BE INSTALLED A MINIMUM DISTANCE OF 5 METRES FROM THE EXISTING WATER MAINS.
- SERVICE TRANSFERS: THE CONTRACTOR IS TO ALLOW FOR THE TRANSFER OF ALL SERVICE CONNECTIONS FROM THE EXISTING MAINS TO THE PROPOSED MAIN. NEW PIPES TO BE 25mm MOPE, TO BE INSTALLED BY OPEN CUT, MOUND OR SLIP LINING AS APPROPRIATE. ESTIMATED NUMBER OF RESIDENTIAL TRANSFERS - 10.
- LOCATION OF CONNECTIONS TO BE DETERMINED BY THE CONTRACTOR ON SITE CAUTION - CABLES, OVERHEAD CABLES ARE PRESENT WITHIN THE WORKING AREA. CONTRACTOR TO REFER TO 'USE GUIDANCE NOTE 038' AVOIDANCE OF DANGER FROM OVERHEAD LINES'. UNDERGROUND CABLES ARE ALSO PRESENT ON SITE. CONTRACTOR TO CONSULT UTILITY DRAWINGS AND IDENTIFY ALL UNDERGROUND SERVICES PRIOR TO COMMENCEMENT OF WORK.
- THE POSITIONING OF THE MAIN IS TO BE IN ACCORDANCE WITH THE NATIONAL JOINT UTILITIES GROUP GUIDELINES (JUGIG 07)
- WORKING PRESSURE ON THIS PROJECT IS 10 BAR (5 BAR ON OUTLET OF PIVY). TEST PRESSURE IS 16 & 12.5 BAR AT THE LOWEST POINT
- ALL WORK IN PRIVATE LAND IS TO BE CARRIED OUT IN ACCORDANCE WITH DOWNS CODE OF PRACTICE FOR PIPELAYING.
- CAUTION - NO CHLORINATED / CONTAMINATED WATER OR DRILLING FLUIDS ARE ALLOWED TO ENTER ANY WATER COURSE OR STORM DRAIN. CONTRACTOR TO REFER TO GUIDELINES ON POLLUTION PREVENTION AND INSTRUCTIONS IN CASE OF EMERGENCY
- THIS DRAWING NEEDS TO BE READ IN CONJUNCTION WITH THE UTILITY INFORMATION PROVIDED SEPARATELY BY THE INDIVIDUAL UNDERTAKERS. TRAIL HOLES MAY BE REQUIRED TO ESTABLISH EXACT LOCATION OF UTILITIES. DETAILS ARE GUIDES ONLY, ALL PIPES, FITTINGS AND ASSOCIATED MATERIALS TO COMPLETE THE JOB ARE TO BE PROVIDED BY CONTRACTOR

KEY:

- Existing water main
- Abandoned water main
- Water main to be abandoned
- Proposed water main - Open cut
- Proposed water main - Directional Drill
- Proposed water main - Pipejacking
- Proposed water main - Slip-lay
- Existing Communication Pipe
- Proposed Communication Pipe
- Construction Access
- TIM Hole Position
- SSR, Scheduled Ancient Monument
- Contaminated Land
- Great Ouse River Restrictions
- Archaeological Restrictions
- Boulder Beds
- Min Shale

SAP ID *** POST CODE LL53 8AH**

Rev.	Date	Drawn	Description	Checked	Approved	Date
B	14.10.13	JH	TENDER ISSUE	MK	HL	14.10.13
A	01.08.13	JH	PRELIMINARY ISSUE	MK	MK	01.08.13

Drawing Status:

TENDER ISSUE

Dŵr Cymru Welsh Water

Capital Delivery Team
ONE TALBOT GATEWAY
BAGLAN ENERGY PARK
SEAWAY PARADE
BAGLAN
PORT TALBOT
SA12 7ER

Tel: 444 (0) 1639 818820
Fax: 444 (0) 1639 818844

Scheme:

**AMP 5 YEAR 4, MIPC
NORTH AREA 7
CAER GEFR, CAPEL CARMEL
WATER MAIN RENEWAL**

Drawing Title:

ROUTE PLAN & MISC DETAILS

Scale	AS SHOWN	Designer	J HOUSTON
Checked		Approved	Date
			OCT 13

Drawing Number:

NP2900416 - 102

Rev:

B



Plate 01: Section A of the opencut trenching. View from the N.



Plate 02: Section B of the opencut trenching. View from the NW



Plate 03: Section C of the opencut trenching, showing the verge cleared along the track ready for the new pipe. View from the NW



Plate 04: Section C with trench showing field drain cutting across it. View from the NE.



Plate 05: Section D of the opencut trenching. View from the SSW.



Plate 06: Pit 01 showing clay glacial horizon. View from the SW.



Plate 07: Pit 02, showing existing pipe in the ground. View from the NE.



Plate 08: Pit 03, showing cut and fill of old pipe. View from the NW.



Plate 09: Pit 04, showing cut and fill of old pipe. View from WNW.



Plate 10: Pit 05, within the road. View from the N.



Gwynedd Archaeological Trust
Ymddiriedolaeth Archaeolegol Gwynedd

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

