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# **Water Mains Renewal, Penmorfa, Tremadog, Gwynedd.**

**January 2015**

**V 1.1**



Archaeological Watching Brief

Project Code: A0036.2

Report no. 0055

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# **Water Mains Renewal, Penmorfa, Tremadog, Gwynedd. January 2015**

Report no. 0055 v1.1

Archaeological Watching Brief

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Project Code: A0036.2

Date: 22/01/2015

Client: Welsh Water

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## **1.0 NON-TECHNICAL SUMMARY**

Aeon Archaeology was commissioned by Dwr Cymru/Welsh Water to carry out an archaeological watching brief during the excavation of two trial holes (THA and THB) to locate the existing water main and during the excavation of a trench for the new replacement water main at Penmorfa, Tremadog, Gwynedd.

The archaeological watching brief did not expose any archaeological remains or artefacts aside from a series of peaks and troughs thought to represent post-medieval drainage earthworks, which were visible across the surface of the northern part of the grazing field.

The topsoil was particularly thin at both trial hole locations and throughout the water main replacement trench, primarily due to the fact that the field forms part of an area of land reclaimed after the construction of the cob in 1811 by William Madocks. This part of the low-lying topography would have formed the edge of a tidal estuary and as such would not have been conducive to early habitation; although recent excavations to the northwest during the by-pass construction had uncovered roof slate stacks from the Roman bath house SAM (CN174) although these had been relocated probably in the post-medieval period.

The high water table of the field and surrounding lowland would however lend itself to the preservation of organic remains and as such it is recommended that if any further intrusive excavations occur within the area that a similar level of watching brief be maintained.



## 2.0 INTRODUCTION, AIMS AND PROJECT DESIGN

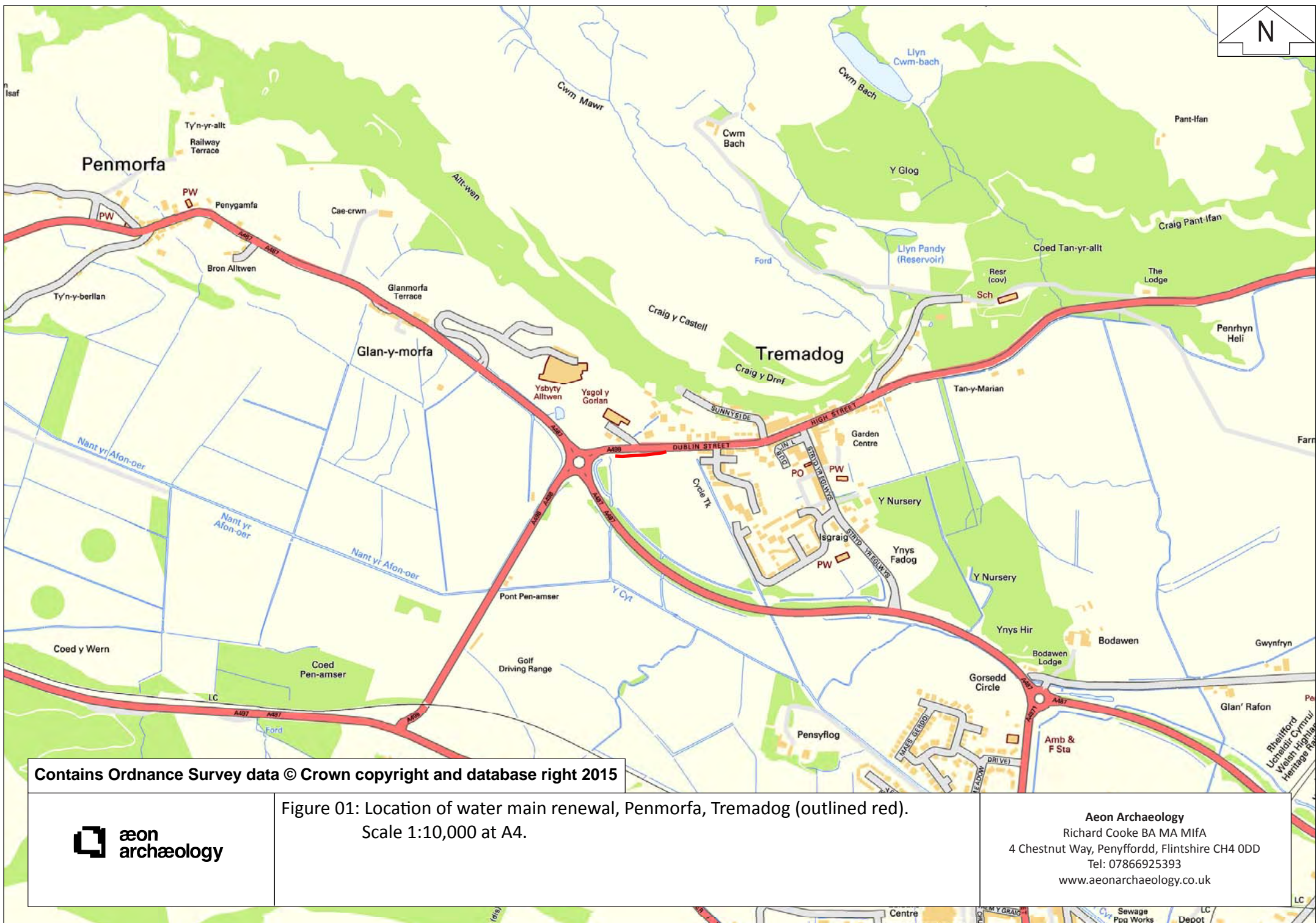
Aeon Archaeology was commissioned by Dwr Cymru/Welsh Water to carry out an archaeological watching brief during the excavation of two trial holes (THA and THB) to locate the existing water main and during the excavation of a trench for the new replacement water main at Penmorfa, Tremadog, Gwynedd (figures 1 and 2).

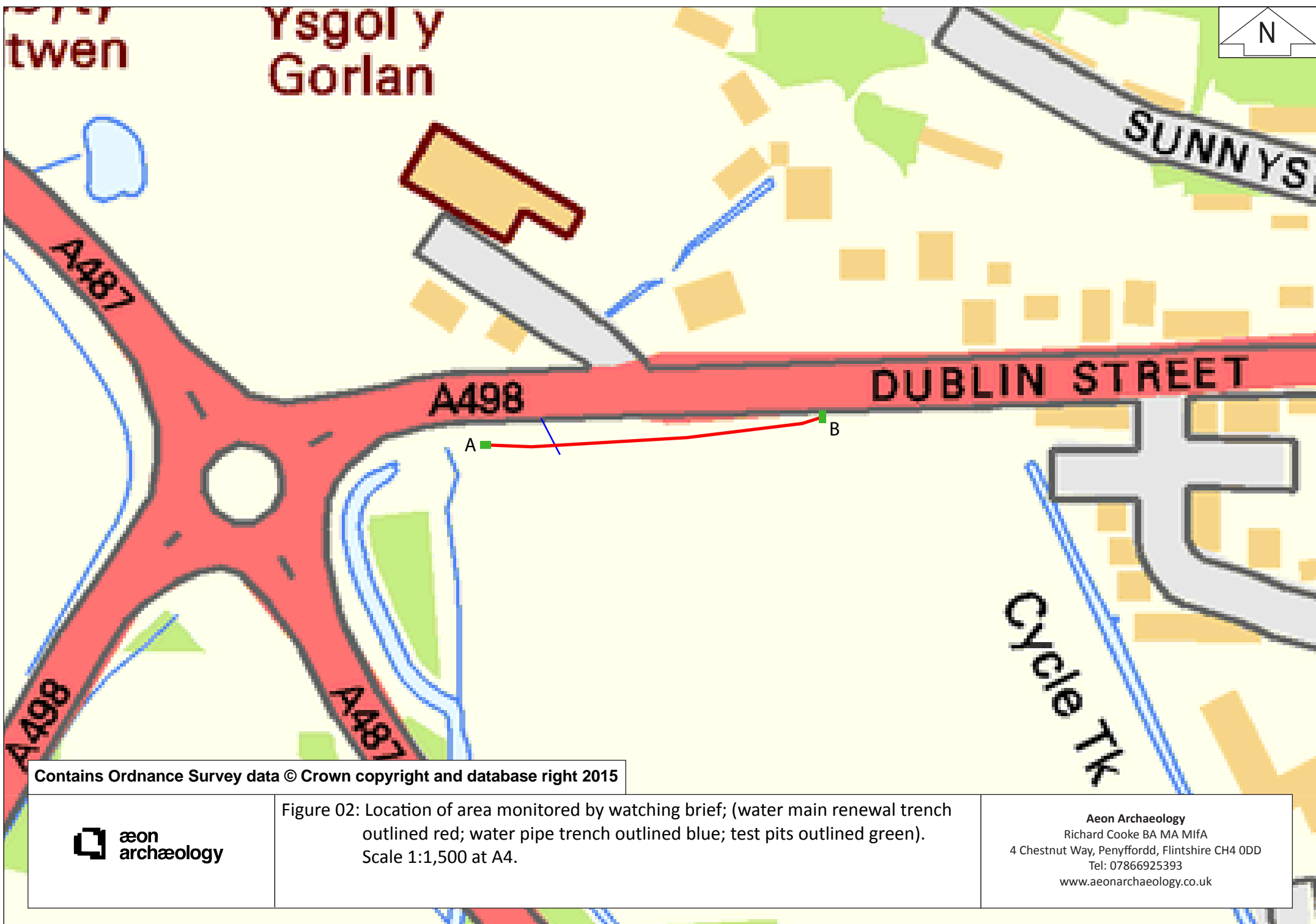
The two trial holes and new water main trench lay within an enclosed grazing field to the immediate south of the A498 Dublin Street, towards the western limit of Tremadog village. The exact location of THA and THB was determined at the outset of works and were centred on **SH 55770 40114** and **SH 55880 40123** respectively. The length of water main to be replaced measured approximately 80.0m and ran from west to east through fields to the immediate west of Tremadog (**NGR SH 55770 40114 to SH 55880 40123**).

A mitigation brief was not prepared for this work by The Gwynedd Archaeological Planning Services (GAPS), but GAPS requested that an archaeological watching brief be maintained during the excavation of the new water main trench and any other excavations within the enclosed field.

The site lies within or in proximity to the following designated areas:

- Approximately 75.0m southeast of the *Roman Bath-House, Tremadog* Scheduled Ancient Monument (CN174).





### 3.0 PROJECT AIMS

The aim of the works was to monitor and where relevant characterise the known, or potential archaeological remains uncovered during the excavation of THA, THB, and the replacement water main trench. A design brief was not produced by the Gwynedd Archaeological Planning Service (GAPS), but GAPS stated in an email to Welsh Water dated 10<sup>th</sup> October 2013 that:

*The Penmorfa scheme is also very close to a scheduled monument, being less than 20m from the remains of Roman bath house (scheduled monument CN174). No work must take place within the scheduled area without scheduled monument consent from Cadw, so if there are any ancillary works or variations to the scheme, which involve breaking the ground or installation (or removal) of fixed structures or infrastructure, Cadw must be contacted beforehand. Applications for SMC can take several weeks to process, and should therefore be made as soon as possible should any work affecting the scheduled area be proposed.*

*In addition to the bath house, various other industrial and Roman features have been identified through development-led investigations near the western end of the scheme. This area is considered to have a high potential for further surviving archaeological evidence. Accordingly, a watching brief should be maintained on this scheme (Emmett, J. 2013).*

The broad aims of the archaeological watching brief were:

- To determine, as far as is reasonably possible, the location, extent, date, character, condition, significance and quality of any surviving archaeological remains on the site, the integrity of which may be threatened by the site works.
- To assess the degree of archaeological survival of buried deposits of archaeological significance.

The detailed objectives of the archaeological watching brief were determined to be:

- Insofar as possible within methodological constraints, to explain any temporal, spatial or functional relationships between the structures/remains identified, and any relationships between these and the archaeological and historic elements of the wider landscape.
- Where the data allows, identify the research implications of the site with reference to the regional research agenda and recent work in Gwynedd.

An Archaeological Written Scheme of Investigation (WSI) (appendix I) was written by Aeon Archaeology and submitted to GAPS in December 2014. This formed the basis of a method statement submitted for the work. The archaeological watching brief was undertaken in accordance with this WSI.

The management of this project has followed the procedures laid out in the standard professional guidance *Management of Archaeological Projects* (English Heritage, 1991), *Management of Research Projects in the Historic Environment Project Manager's Guide* (English Heritage 2006), and in the Institute for Archaeologists *Standard and Guidance for an archaeological watching brief* (1994 rev. 2001 and 2008). Five stages are specified:

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

- Phase 5: dissemination

The current document reports on the phase 4 analysis and states the means to be used to disseminate the results. The purpose of this phase is to carry out the analysis identified in phase 3 (the assessment of potential phase), to amalgamate the results of the specialist studies, if required, with the detailed site narrative and provide both specific and overall interpretations. The site is to be set in its landscape context so that its full character and importance can be understood. All the information is to be presented in a report that will be held by the Gwynedd Historic Environment Record (HER) so that it can be accessible to the public and future researchers. This phase of work also includes archiving the material and documentary records from the project.



## 4.0 METHODOLOGY

### 4.1 Watching Brief

(Reproduced from CIFA. 2001. *Chartered Institute for Archaeologists 1994 rev. 2001 and 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 does 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 CIFA. 2001. *Chartered Institute for Archaeologists 2001 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).

An **intensive** watching brief was maintained during the excavation of THA, THB and the new replacement water main trench.

### 4.2 Data Collection from Site Records

A database of the site photographs was produced to enable active long-term curation of the photographs and easy searching. The site records were checked and cross-referenced and photographs were cross-referenced to contexts. These records were used to write the site narrative and the field drawings and survey data were used to produce an outline plan of the trench locations.

All paper field records were scanned to provide a backup digital copy. The photographs were organised and precisely cross-referenced to the digital photographic record so that the Gwynedd Historic Environment Record (HER) can curate them in their active digital storage facility.

### 4.3 Artefact Methodology

All artefacts were to be collected and processed including those found within spoil tips. Finds numbers would be attributed and they would be bagged and labelled as well as any preliminary identification taking place on site. After processing, all artefacts would be cleaned and examined in-house at Aeon Archaeology. If required, artefacts would be sent to a relevant specialist for conservation and analysis.

The recovery policy for archaeological finds was kept under review throughout the watching brief and trial trench. Any changes in recovery priorities would be made under guidance from an appropriate specialist and agreed with GAPS. There was a presumption against the disposal of archaeological finds regardless of their apparent age or condition.

#### **4.4 Environmental Samples Methodology**

The sampling strategy and requirement for bulk soil samples was related to the perceived character, interpretational importance and chronological significance of the strata under investigation. This ensured that only significant features would be sampled. The aim of the sampling strategy was to recover carbonised macroscopic plant remains, small artefacts particularly knapping debris and evidence for metalworking.

Advice and guidance regarding environmental samples and their suitability for radiocarbon dating, as well as the analysis of macrofossils (charcoal and wood), pollen, animal bones and molluscs would be obtained from Oxford Archaeology if required.

#### **4.5 Report and dissemination**

A full archive including plans, photographs and written material resulting from the project was prepared. All plans, photographs and descriptions were labelled, and cross-referenced. Copies of the report will be sent to the regional HER (Gwynedd Archaeological Trust, Craig Beuno, Garth Road, Bangor, Gwynedd LL57 2RT), and the Royal Commission on the Ancient and Historic Monuments of Wales (RCAHMW Aberystwyth).

## 5.0 THE HISTORICAL CONTEXT

The main historic interest lies in the close proximity of the Roman Bath-House Scheduled Ancient Monument (SAM) (CN174) lying approximately 75.0m to the northwest of TH05. The SAM lies 3.0m above Ordnance Datum just west of Tremadog at the foot of steep slopes falling from Graig y Castell on the north and at the northern edge of the flat land, extending westwards from Porthmadog that was formerly an inlet of the sea.

In approximately 1810 an immense quantity of bones was removed from the site, and in 1949 a tomb at *Llidiart yr Ysbytty* is mentioned. In 1868 large quantities of Roman brick, bones etc were stated to have been discovered and excavations were conducted which yielded a large quantity of Roman tile, some good masonry of very early character but not apparently Roman, bones and other debris. During the opening of a drain in 1876 "the remains of an ancient sepulchre" were exposed together with "masonry tiles and a large slab...of concrete." Also exposed, a section of rolled lead piping. The knowledge of the site is, however, chiefly due to the excavations carried out by Mr. C. E. Breese in 1908.

The building was a Roman bath house of stone. Rectangular in plan consisting of four in-line rooms. A corridor and the smaller southern room were lower than the rest of the building. Although hypocausts were found in two rooms, the others must have been included in the heating arrangements.

The walls varied from 0.6m to 1.0m in thickness and stood from 0.6 to 2.0m high. They were faced with roughly coursed masonry set in mortar mixed with pounded tile; the core was compressed of shells fragments of tile and other debris. Loose fragments of plaster suggested that the walls had originally been plastered.

Small finds were numerous and included flue and ridge tiles, roofing slates, part of the arm of a terracotta statue, pottery and glass, part of a hinged jet bangle, iron and lead objects, animal bones and shells. The pottery indicates an occupation from the 2nd to the 4th centuries.



## **6.0 QUANTIFICATION OF RESULTS**

### **6.1 The Documentary Archive**

The following documentary records were created during the archaeological watching brief.

Context sheets	0
Watching brief day sheets	5
Drawings	0
Digital photographs	28

### **6.2 Environmental Samples**

No environmental samples were taken as part of the watching brief as no suitable archaeological deposits were encountered.

### **6.3 Artefacts**

No artefacts were recovered during the archaeological watching brief.

## **7.0 RESULTS OF THE ARCHAEOLOGICAL WATCHING BRIEF**

An intensive watching brief was maintained during the excavation of THA and THB as well as during the excavation of the replacement water main trench. A watching brief was also maintained during the excavation of a trench to reposition an existing water pipe.

The location and orientation of photographs are shown on figure 3.

### **Trial Hole A (THA)** (figures 2 and 3; plates 1 and 2)

THA was centred on NGR SH 55770 40114 towards the northwest corner of the enclosed grazing field immediately south of the A498 Dublin Street. The inspection trench measured 2.0m in length by 0.5m in width orientated east to west. It was excavated to a depth of 1.0m through a 0.2m deep mid grey-brown silt-clay topsoil, a 0.6m deep light yellow-brown natural clay substrata, and a >0.2m deep dark black-grey natural clay substrata.

The trench did not reveal any archaeological remains or any artefacts from any periods. The existing PVC water main was located in the base of the trench and it can be surmised that the immediate location had been disturbed through the associated trenching.

### **Trial Hole B (THB)** (figures 2 and 3; plates 3 and 4)

THB was centred on NGR SH 55880 40123 towards the northeast corner of the enclosed grazing field immediately south of the A498 Dublin Street. The inspection trench measured 3.5m in length by 0.5m in width orientated north to south. It was excavated to a depth of 1.0m through a 0.2m deep mid grey-brown silt-clay topsoil, a 0.6m deep light yellow-brown natural clay substrata, and a >0.2m deep dark black-grey natural clay substrata.

The trench did not reveal any archaeological remains or any artefacts from any periods. Furthermore the existing main was not located within the trench.

### **Water Pipe Trench** (figures 2 and 3; plates 5 and 6)

Before the replacement water main trench could be excavated an existing agricultural water pipe was required to be relocated to the south side of the 10.0m wide easement. As such a new trench was excavated from SH 55788 40123 to SH 55794 40111 towards the west of the grazing field and immediately south of the A498 Dublin Street. The trench measured 12.0m in length by 0.4m in width orientated northwest to southeast. It was excavated to a depth of 0.5m through a 0.2m deep mid grey-brown silt-clay topsoil, a 0.6m deep light yellow-brown natural clay substrata, and a >0.2m deep dark black-grey natural clay substrata.

The trench did not reveal any archaeological remains or any artefacts from any periods.

### **Water Main Replacement Trench** (figures 2 and 3)

#### **7<sup>th</sup> January 2015 (plates 7 and 8)**

A watching brief was maintained during the excavation of the replacement water main trench from NGR SH 55880 40123 to SH 55873 40121 40111 towards the northeast of the grazing field and immediately south of the A498 Dublin Street. The trench measured approximately 12.0m in length by 0.5m in width orientated northeast to southwest. It was excavated to a depth of 0.9m through a 0.2m deep mid grey-brown silt-clay topsoil, a 0.5m deep light yellow-brown natural clay substrata, and a >0.2m deep dark black-grey natural clay substrata.

The trench did not reveal any archaeological remains or any artefacts from any periods.

### **8<sup>th</sup> January 2015 (plates 9 and 10)**

A watching brief was maintained during the excavation of the replacement water main trench from NGR SH 55873 40121 to SH 55836 40129 towards the northeast of the grazing field and immediately south of the A498 Dublin Street. The trench measured approximately 36.0m in length by 0.5m in width orientated east to west. It was excavated to a depth of 0.9m through a 0.15m deep mid grey-brown silt-clay topsoil, a 0.5m deep light yellow-brown natural clay substrata, and a >0.25m deep dark black-grey natural clay substrata.

The trench did not reveal any archaeological remains or any artefacts from any periods.

### **9<sup>th</sup> January 2015 (plates 11 - 14)**

A watching brief was maintained during the excavation of the replacement water main trench from NGR SH 55836 40129 to 55785 40113 towards the north of the grazing field and immediately south of the A498 Dublin Street. The trench measured approximately 72.0m in length by 0.5m in width orientated east to west. It was excavated to a depth of between 0.7m to 0.9m although this was in fact due to the presence of broad peaks and troughs (see below). The trench cut through a 0.1m-0.3m deep mid grey-brown silt-clay topsoil, a 0.5m deep light yellow-brown natural clay substrata, and a >0.25m deep dark black-grey natural clay substrata.

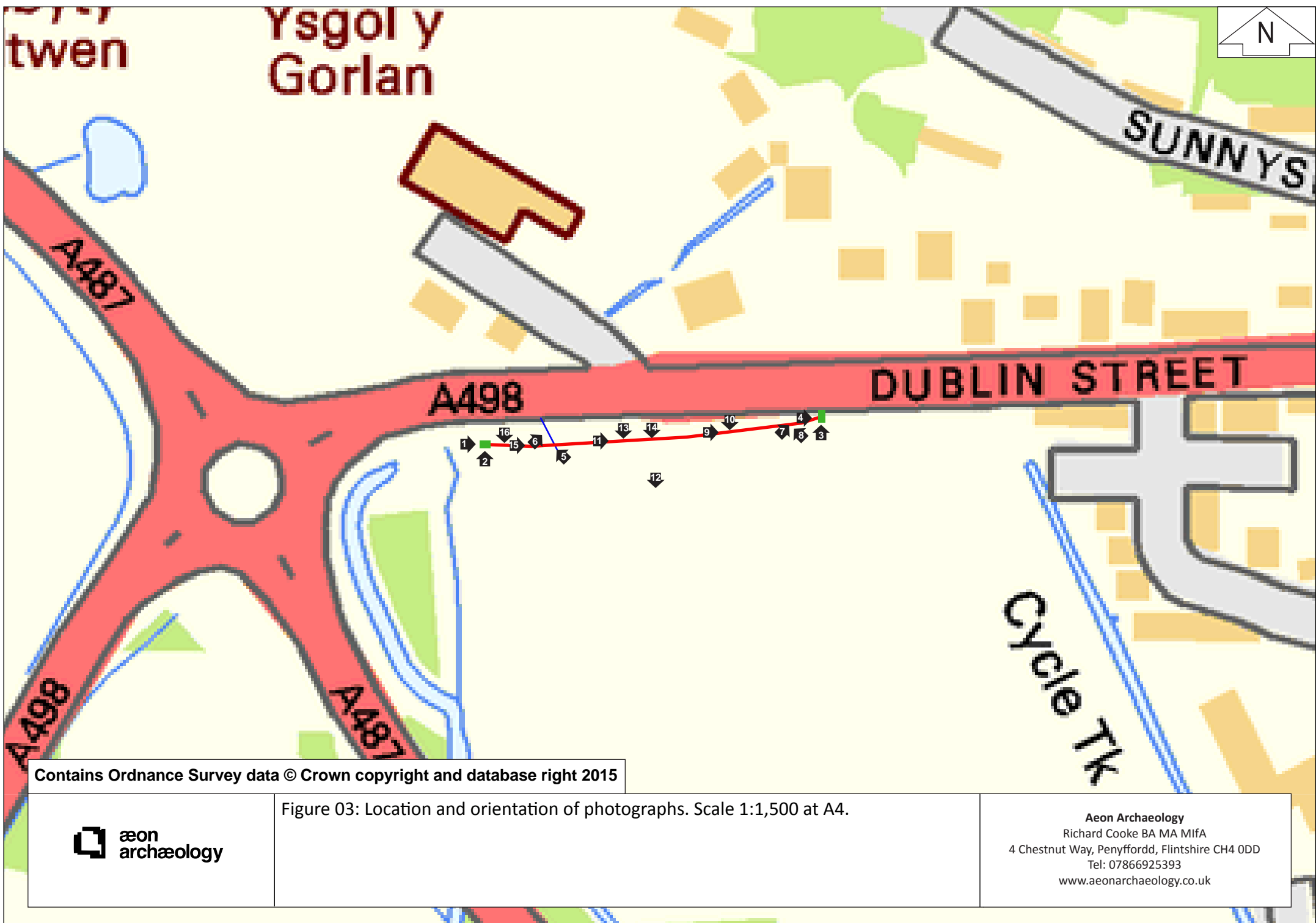
### **PRN 60098 – Peaks and troughs (post-medieval)**

A series of broad peaks and troughs are orientated from north to south and occupy the northern half of the grazing field located to the immediate south of A498 Dublin Street and to the west of Tremadog, centred on NGR SH 55853 40068. The peaks measure 8.0m in width and the troughs measure 4.0m in width, with the approximate height between peak and trough averaging 0.6m. No distinction could be made between the peaks and troughs within the trench section aside from an increase in topsoil depth from 0.1m to 0.3m. These earthworks were initially thought to represent an area of medieval ridge and furrow farming, however as the land was almost certainly reclaimed upon the construction of the cob in 1811 it is far more likely that these peaks and troughs were created in order to counteract the high water table and increase land drainage.

### **12<sup>th</sup> January 2015 (plates 15 and 16)**

A watching brief was maintained during the excavation of the replacement water main trench from NGR SH 55785 40113 to SH 55770 40114 towards the northwest of the grazing field and immediately south of the A498 Dublin Street. The trench measured approximately 16.0m in length by 0.5m in width orientated east to west. It was excavated to a depth of 0.9m through a 0.15m deep mid grey-brown silt-clay topsoil, a 0.5m deep light yellow-brown natural clay substrata, and a >0.25m deep dark black-grey natural clay substrata.

The trench did not reveal any archaeological remains or any artefacts from any periods.



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Figure 03: Location and orientation of photographs. Scale 1:1,500 at A4.

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**Plate 01:** Test Pit A, from the west. Scale 0.5m.





**Plate 02:** South facing section of Test Pit A, from the south. Scale 0.5m.





**Plate 03:** Test Pit B, from the south. Scale 0.5m.



**Plate 04:** West facing section of Test Pit B, from the west. Scale 0.5m.





**Plate 05:** Water pipe trench, from the southwest. Scale 0.5m.



**Plate 06:** Southwest facing section of water pipe trench, from the southeast. Scale 0.5m.





**Plate 07:** Water Main renewal trench SH 55880 40123 - SH 55873 40121, from the southwest. Scale 0.5m.

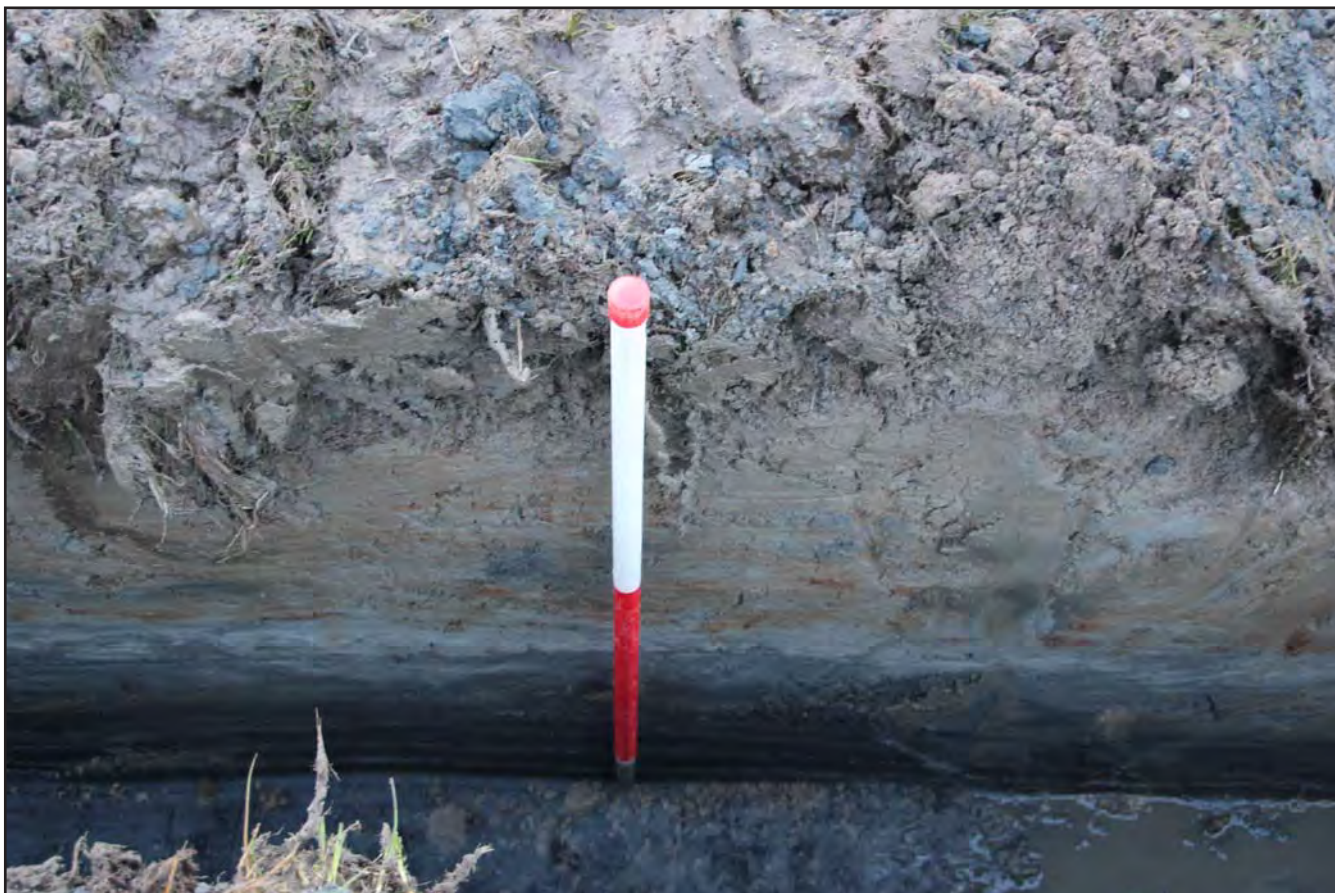


**Plate 08:** Southeast facing section of Water Main renewal trench SH 55880 40123 - SH 55873 40121, from the southeast. Scale 0.5m.





**Plate 09:** Water Main renewal trench SH 55873 40121 - SH 55836 40129, from the west. Scale 0.5m.



**Plate 10:** North facing section of Water Main renewal trench SH 55873 40121 - SH 55836 40129, from the north. Scale 1.0m.





**Plate 11:** Water Main renewal trench SH 55836 40129 - SH 55785 40113, from the west. Scale 0.5m.



**Plate 12:** Peaks and troughs, from the north. Scale 1.0m.





**Plate 13:** North facing section of Mains Renewal trench showing drainage peak at SH 55818 40125, from the north. Scale 1.0m.



**Plate 14:** North facing section of Mains Renewal trench showing drainage trough at SH 55823 40127, from the north. Scale 1.0m.





**Plate 15:** Water Main renewal trench SH 55785 40113 - SH 55770 40114, from the west. Scale 1.0m.



**Plate 16:** North facing section of Mains Renewal trench SH 55785 40113 - SH 55770 40114, from the north. Scale 1.0m.



## 8.0 CONCLUSION AND RECOMMENDATIONS

The archaeological watching brief during the excavation of THA, THB, and the replacement water main trench at Penmorfa, Tremadog did not expose any archaeological remains or artefacts aside from a series of peaks and troughs thought to represent post-medieval drainage earthworks, which were visible across the surface of the northern part of the grazing field.

The topsoil was particularly thin at both trial hole locations and throughout the water main replacement trench, primarily due to the fact that the field forms part of an area of land reclaimed after the construction of the cob in 1811 by William Madocks. This part of the low-lying topography would have formed the edge of a tidal estuary and as such would not have been conducive to early habitation, although recent excavations to the northwest during the by-pass construction had uncovered roof slate stacks from the Roman bath house SAM (CN174) although these had been relocated probably in the post-medieval period.

The high water table of the field and surrounding lowland would however lend itself to the preservation of organic remains and as such it is recommended that if any further intrusive excavations occur within the area that a similar level of watching brief be maintained.

## 9.0 SOURCES

### *OS Maps*

1<sup>st</sup> edition 25 inch Ordnance Survey Map of 1889.

2<sup>nd</sup> edition 25 inch Ordnance Survey Map of 1900.

3<sup>rd</sup> edition 25 inch Ordnance Survey Map of 1918.

OS 1:10 000 Series sheet SH 33NE, SH 33SE, SH 33SW, and SH 33NW.

### *Secondary sources*

British Geological Survey: [www.bgs.ac.uk](http://www.bgs.ac.uk)

English Heritage, 1991. *Management of Archaeological Projects*

English Heritage, 2006. *Management of Research Projects in the Historic Environment Project Manager's Guide*

Gwynedd Historic Environment Record

Institute of Field Archaeologists, 1994, rev. 2001 & 2008. *Standard and Guidance for Archaeological Watching Brief*

Institute of Field Archaeologists, 1995 revised Oct 2008. *Standards and Guidance: Excavation*

Leigh, D. 1972. *First Aid for Finds*

Robinson, W. 1998. *First Aid for Underwater Finds*

## **APPENDIX I – PROJECT DESIGN FOR ARCHAEOLOGICAL WATCHING BRIEF**



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# Written Scheme of Investigation (WSI) for Archaeological Watching Brief.

**Penmorfa, Tremadog, Gwynedd.**  
**3rd December 2014**  
**V 1.1**



Archaeological Watching Brief

Project Code: A0036.2

NGR: SH 55781 40083

Scheme Code: NP2900490

Client: Dwr Cymru

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**Penmorfa, Tremadog, Gwynedd.  
3rd December 2014  
V 1.1**

WSI for Archaeological Watching Brief

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Archaeological Watching Brief  
Project Code: A0036.2  
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## 1.0 INTRODUCTION

Aeon Archaeology has been asked by Dwr Cymru/ Welsh Water to provide a written scheme of investigation (WSI) for carrying out an archaeological watching brief during the excavation of open cut trench during the renewal of the existing water main at Penmorfa, Tremadog, Gwynedd. The length of water main to be replaced measures approximately 30.0m and runs from west to east through fields to the immediate west of Tremadog (NGR SH 55781 40083 – SH 55940 40120).

A mitigation brief has not been prepared for this work by The Gwynedd Archaeological Planning Services (GAPS), but GAPS has requested that an archaeological watching brief be maintained during the excavation of open-cut trench.

It is requirement that the content of this WSI be approved by GAPS prior to the commencement of works.

The watching brief will be carried out on an **intensive** basis during the excavation of all parts of the open-cut trench within the enclosed grazing field.

Reference will be made to the guidelines specified in Standard and Guidance for Archaeological Watching Brief (Institute for Archaeologists, 1994, rev. 2001 and 2008).

## 2.0 STATUTORY AND NON-STATUTORY DESIGNATIONS

The site lies within or in proximity to the following designated areas:

- Approximately 75.0m southeast of the *Roman Bath-House, Tremadog* Scheduled Ancient Monument (CN174).

## 3.0 ARCHAEOLOGICAL BACKGROUND

The main historic interest lies in the close proximity of the Roman Bath-House Scheduled Ancient Monument (SAM) (CN174) lying approximately 75.0m to the northwest of TH05. The SAM lies 3.0m above Ordnance Datum just west of Tremadog at the foot of steep slopes falling from Graig y Castell on the north and at the northern edge of the flat land, extending westwards from Porthmadog that was formerly an inlet of the sea.

In approximately 1810 an immense quantity of bones was removed from the site, and in 1949 a tomb at *Llidiart yr Ysbytty* is mentioned. In 1868 large quantities of Roman brick, bones etc were stated to have been discovered and excavations were conducted which yielded a large quantity of Roman tile, some good masonry of very early character but not apparently Roman, bones and other debris. During the opening of a drain in 1876 "the remains of an ancient sepulchre" were exposed together with "masonry tiles and a large slab...of concrete." Also exposed, a section of rolled lead piping. The knowledge of the site is, however, chiefly due to the excavations carried out by Mr. C. E. Breese in 1908.

The building was a Roman bath house of stone. Rectangular in plan consisting of four in-line rooms. A corridor and the smaller southern room were lower than the rest of the building. Although hypocausts were found in two rooms, the others must have been included in the heating arrangements.

The walls varied from 0.6m to 1.0m in thickness and stood from 0.6 to 2.0m high. They were faced with roughly coursed masonry set in mortar mixed with pounded tile; the core was compressed of shells fragments of tile and other debris. Loose fragments of plaster suggested that the walls had originally been plastered.

Small finds were numerous and included flue and ridge tiles, roofing slates, part of the arm of a terracotta statue, pottery and glass, part of a hinged jet bangle, iron and lead objects, animal bones and shells. The pottery indicates an occupation from the 2nd to the 4th centuries (Gwynedd HER).

#### 4.0 ARCHAEOLOGICAL AIMS

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

- Observation of areas of open-cut trenching within the enclosed grazing field.
- A drawn, written and photographic record of any archaeological features, including structures that may be revealed by the work.
- Preparation of a full archive report.

If archaeological remains are encountered during the watching brief it may be necessary to suspend development work in that area. The client should have a suitable contingency in place in case of such a scenario.

#### 5.0 PROGRAMME OF WORK

##### 5.1 Archaeological Watching Brief

The Institute for Archaeologists (IfA) defines an archaeological watching brief as:

*‘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.’* (IfA 1994, rev. 2008)

GAPS has requested that an **intensive** watching brief be maintained during the excavation of areas of open-cut trenching. This level of watching brief entails that an appropriately qualified archaeologist is present during all associated ground disturbance.

All soil removal will be undertaken using a mechanical excavator fitted with a toothless ditching bucket. A photographic record will be maintained throughout, using a digital SLR camera (Canon 550D) set to maximum resolution and any subsurface remains will be recorded photographically, with detailed notations and measured drawings being undertaken if required.

In the event of archaeological discovery features will be excavated by hand and will be fully recorded using Aeon Archaeology pro-formas, digital photographs, and plan and section drawings taken at a suitable scale (usually 1:20 for plan drawings and 1:10 for section drawings).

The archive produced will be held at Aeon Archaeology under the project code **A0036.2**.

## 5.2 Watching Brief Report

A report on the results of the archaeological watching brief, in accordance with the recommendations in *Management of Archaeological Projects* (English Heritage, 1991), *Management of Research Projects in the Historic Environment Project Manager's Guide* (English Heritage 2006), and in the Institute for Archaeologists *Standard and Guidance for an archaeological watching brief* (1994 rev. 2001 and 2008) will be required to be produced upon conclusion of the archaeological fieldwork. The report will be completed within a maximum of six months of completion of work on site and may include examination and quantification leading to the identification of function, form, date, method of manufacture, material/fabric type, source, parallels, attributes and condition of artefacts; of the exploitation of wild or domesticated resources; the reconstruction of environments; and the nature of human populations.

Full analysis of the results of the project, including: dating and interpretation of excavated features; pottery and other finds analysis; analysis of industrial residues by an appropriate specialist or specialists; analysis of samples for environmental data (including pollen, plant macrofossils and beetles) by an appropriate specialist or specialists; radiocarbon dating; discussion of the results in their local, regional and national context, including relating the excavated features and palaeoenvironmental data to evidence from nearby sites, and discussion of the results in their local, regional and national context may be required.

Following completion of the stages outlined above, a report will be produced that will include:

- A non-technical summary
- A table of contents
- An introduction with acknowledgements, including a list of all those involved in the project and the location and description of the site
- A statement of the project aims
- An account of the project methodology undertaken, with an assessment of the same to include a statement on preservation bias and the means of data collection and sampling strategies
- A factual summary of the history, development and use of the site
- A statement setting out the nature, quantity and condition of the material archive (artefacts and ecofacts) including commentary on any bias observed due to collection and sampling strategies and commentary on long-term storage requirements
  - A statement setting out the nature and quantity of the documentary archive (notes, photographs, drawings, digital data)
- A general site plan indicating the position and size of the areas subject to watching brief and the locations of archaeological deposits identified and recorded during the works
- Plans and sections at appropriate scales, augmented with appropriate photographs. All plans and sections will be related to the Ordnance Survey datum levels and to the National Grid
- Other maps, plans, drawings, stratigraphic matrices and photographs as appropriate
- Summary assessment reports on the artefact, bio-archaeological, dating and other assessments/analyses
  - A discussion of the location, extent, date, nature, condition, quality and significance of any archaeological deposits and finds identified during the project.
  - A discussion of any research implications arising from the archaeological work.
  - Notes on consultations with conservators and the nominated archive repository related to the immediate and long-term conservation and storage requirements for the data held in the site archive and recommendations of retention/discard of artefacts and ecofacts.
- A bibliography sources consulted.

- Appendices to the report will include artefact catalogues, reports on assessments/analyses and an index to the project archive and a statement on its location/proposed repository.

### 5.3 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 project. The report will also be lodged with The Royal Commission for the Ancient and Historic Monuments in Wales (RCAHMW) Aberystwyth.

## 6.0 FURTHER ARCHAEOLOGICAL WORKS

The identification of significant archaeological features during the watching brief stage may necessitate further archaeological works. This will require the submission of new cost estimates to the contractor and may be subject to a separate WSI, to be agreed by the Gwynedd Archaeological Planning Service prior to implementation.

This WSI does not include a methodology or cost for examination of, conservation of, or archiving of finds discovered during the evaluation, nor of any radiocarbon dates required, nor of examination of palaeoenvironmental samples associated with any peat deposits. The need for these will be identified in the post-fieldwork programme (if required), and a new WSI will be issued for approval by the Gwynedd Archaeological Planning Service.

## 7.0 ENVIRONMENTAL SAMPLES

If necessary, relevant archaeological deposits will be sampled by taking bulk samples (a minimum of 10.0 litres and maximum of 30.0 litres) 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.

Bulk environmental samples will also be taken from any fills, deposits or structures which yield archaeological artefacts, charcoal flecks/ fragments, bone, or any other historic remains.

Advice and guidance regarding environmental samples and their suitability for radiocarbon dating, as well as the analysis of macrofossils (charcoal and wood), pollen, animal bones and molluscs will be obtained from Oxford Archaeology.

For guidance purposes the following volume criteria represent the minimum feature sampling requirements:

- 50% of each discrete feature (e.g. pits and postholes)
- 25% of the exposed areas of each linear feature and all terminals/intersections
- 50% of structural features (e.g. beamslots, ring-ditches)
- 50%-100% of domestic/industrial working features (e.g. hearths and ovens)

## 8.0 HUMAN REMAINS

Any finds of human remains will be left *in-situ*, covered and protected, and both the coroner and the Gwynedd Archaeological Planning Service 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.

## **9.0 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 recommended that all finds are donated to an appropriate museum where they can receive specialist treatment and study. Access to finds must be granted to Aeon Archaeology 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). Aeon Archaeology staff will undertake initial identification, but any additional advice would be sought from a wide range of consultants.

The recovery policy for archaeological finds will be kept under review throughout the fieldwork phase. Any changes in recovery priorities will be under guidance from an appropriate specialist and agreed with the Gwynedd Archaeological Planning Service. There will be a presumption against the disposal of archaeological finds with the exception of unstratified items dating to the twentieth or twenty-first centuries AD which will be recorded by material, type, form, identification and weight, and discarded.

All finds will be collected and processed including those found within spoil tips. Their location will be recorded; finds numbers attributed, bagged and labelled as well any preliminary identification taking place on site. Where specialist advice is required provision will be made to do so at the earliest possible convenience.

After processing, artefacts which are suitable will be cleaned and conserved in-house. Artefacts requiring specialist cleaning and conservation will be sent to the relevant specialist. All finds will then be sent to a specialist for analysis, the results of which will then be assessed to ascertain the potential of the finds assemblage to meet the research aims of the project. The value of the finds will also be assessed in terms of the wider educational and academic contributions.

## **10.0 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.

The British Museum 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.

## **11.0 STAFF & TIMETABLE**

### **11.1 Staff**

The work will be managed and by Richard Cooke BA MA MifA, Archaeological Contractor and Consultant at Aeon Archaeology. An appropriately qualified archaeologist (Tbc) will undertake the watching brief.

### **11.2 Timetable**

The evaluation work can currently be undertaken from early December 2014, although the client is encouraged to give as much notice as possible to Aeon Archaeology as project commitments are currently high.

## **12.0 HEALTH AND SAFETY**

Aeon Archaeology has a Health and Safety Policy Statement which can be supplied upon request. Furthermore, site-specific Risk Assessments and Method Statements are compiled and distributed to every member of staff involved with the project prior to the commencement of works.

## **13.0 INSURANCE**

*Liability Insurance – Towergate Insurance Policy 000467*

- Employers' Liability: Limit of Indemnity £10m in any one occurrence
- Public Liability: Limit of Indemnity £2m in any one occurrence
- Legal Defence Costs (Health and Safety at Work Act): £250,000

The current period expires 30/09/15

*Professional Indemnity Insurance – Towergate Insurance Policy 2011025521290*

- Limit of Indemnity £500,000 any one claim

The current period expires 30/09/15

## **14.0 GENERAL**

All project staff will adhere to the *Code of Conduct of the Institute of Field Archaeologists*.

The project will follow the requirements set down in the *Standard and Guidance for Archaeological Excavation* prepared by the Institute of Field Archaeologists.

A Method Statement and Risk Assessment will be prepared prior to the commencement of fieldwork and circulated to all staff concerned.

Please note the following:

Aeon Archaeology will not be held responsible for any delays to the work programme resulting from the discovery of archaeological sites or finds.

The cost quoted does not include examination of, conservation of or archiving of finds discovered during the archaeological programme, nor of any radiocarbon dates required, nor of examination of palaeoenvironmental samples. Contingency costs are provided below.

**Payment is strictly due within 30 days of the date on the issued invoice.**

**Payment will be taken as the date of receipt of cheque or, where payment is by BACS, date of receipt of payment to the nominated account. Failure to pay the invoiced balance within 30 days will result in a:**

- **levy a compensation charge of £40 (for sums under £1000) or £70 (for sums to £9,999)**
- **plus 13.75% of the contract value (plus levy and charges) on the start of every subsequent 30 day period after the lapse of the 30 day term (in accordance with the late Payment of Commercial Debts (interest) Act 1998)**

## **CONTINGENCY COSTS**

The following contingency costs will apply if relevant:

Cost of orange mesh fencing: £22.95 per roll

Cost of road pins: £2.50 each.

Cost of TERAM geotextile matting: @£39.95 roll

Shoring of pits, if required, will be charged at cost of material and acro-prop hire.

Removal of excess spoil, or temporary storage of spoil at cost of haulage and tipping. It is anticipated that the spoil will be stored on-site ready for re-instatement.

Cleaning, examination and drawing of finds £250/day

Conservation of finds £250/day

Materials and containers for storage of finds will be charged at cost

Examination and report of skeletal remains £250/day

Examination of palaeo-ecological samples £250/day

Radiocarbon dates: AMS £450 per date

Note: All figures are quoted exclusive of VAT, which will be added at the appropriate rate.

## **SPECIALISTS**

Specialist advice required will be sought from the following list:

- Bone: Nora Bermingham
- Glass: Hilary Cool, Barbican Research Associates.
- Metal artefacts: Phil Parkes, Cardiff Conservation Services, Cardiff.
- Slag, burnt clay, hammerscale: Dr. Tim Young, Geoarch, Cardiff.
- Stone artefacts: Oxford Archaeology
- Wood artefacts: Jane Foley, Foley Conservation, Builth Wells.
- Leather: Quita Mould, Barbican Research Associates.
- Waterlogged environmental: Dr Mike Allen, Allen Environmental Archaeology.
- Environmental samples: Oxford Archaeology
- Numismatics: Peter Guest, Barbican Research Associates.
- Pottery (all periods): Oxford Archaeology
- Clay pipe: Oxford Archaeology

Depending upon the material of the remains the following experts will be consulted regarding the conservation of waterlogged material:

- Organic material: Mr Phil Parkes, Cardiff Conservation Services (tel: +44(0)29 2087 5628)
- Non-organic material: Mr Phil Parkes, Cardiff Conservation Services (tel: +44(0)29 2087 5628)



HAZARD WARNINGS	
IN LINE WITH DESIGNERS RESPONSIBILITIES UNDER CDM REGS 2007	
	OVERHEAD POWERLINES
	DEEP EXCAVATIONS
	WORKING IN HIGHWAY
	EXCAVATING NEAR WATER MAINS AND OTHER UTILITIES
	EXCAVATING NEAR DC-HV SEWER RAISING MAN
RESIDUAL RISKS	
1	WORKING UNDER OR NEAR OVERHEAD CABLES
2	CONNECTION TO PRESSURISED WATER MAINS
3	WORKING IN DEEP EXCAVATIONS
4	WORKING NEAR LIVE WATER MAIN
5	MOVING TRAFFIC
6	PEDESTRIAN ACCESS TO SCHOOL
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.

THIS IS AN INDICATIVE ROUTE PROPOSED BY DCWW, CONTRACTOR CAN PROVIDE A DIFFERENT SOLUTION FOR CONSIDERATION IF SUITABLE. DURING THE TENDER STAGE THE CONTRACTOR HAS TO CONFIRM METREAGE AND METODS OF CONSTRUCTION

**SCHEME DETAILS**  
REHAB APPROX. 510m OF 3" AC MAIN WITH 110mm HPPE 16 BAR - AND ABANDON EXISTING 3"AC ON COMPLETION OF WORKS. NO RISK REQUIRED.

TMA NOTICE 1 (A) - (B)  
USRN: 46401637

DUBLIN STREET, TREMADOG  
GRID REF: 256888,340126 - 256172,340181  
TMA:  
METHOD OF CONSTRUCTION: OPENCUT  
DURATION: 8 WEEKS  
SAP ID: 9315534460

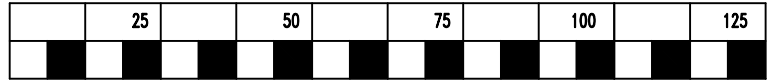
TMA NOTICE 1 (B) - (C)  
USRN: 46401776

MARKET SQUARE, TREMADOG  
GRID REF: 256172,340181 - 256193,340133  
TMA:  
METHOD OF CONSTRUCTION: OPENCUT  
DURATION: 6 WEEKS  
SAP ID: 9315534470

TMA NOTICE 1 (C) - (D)  
USRN: 46402529

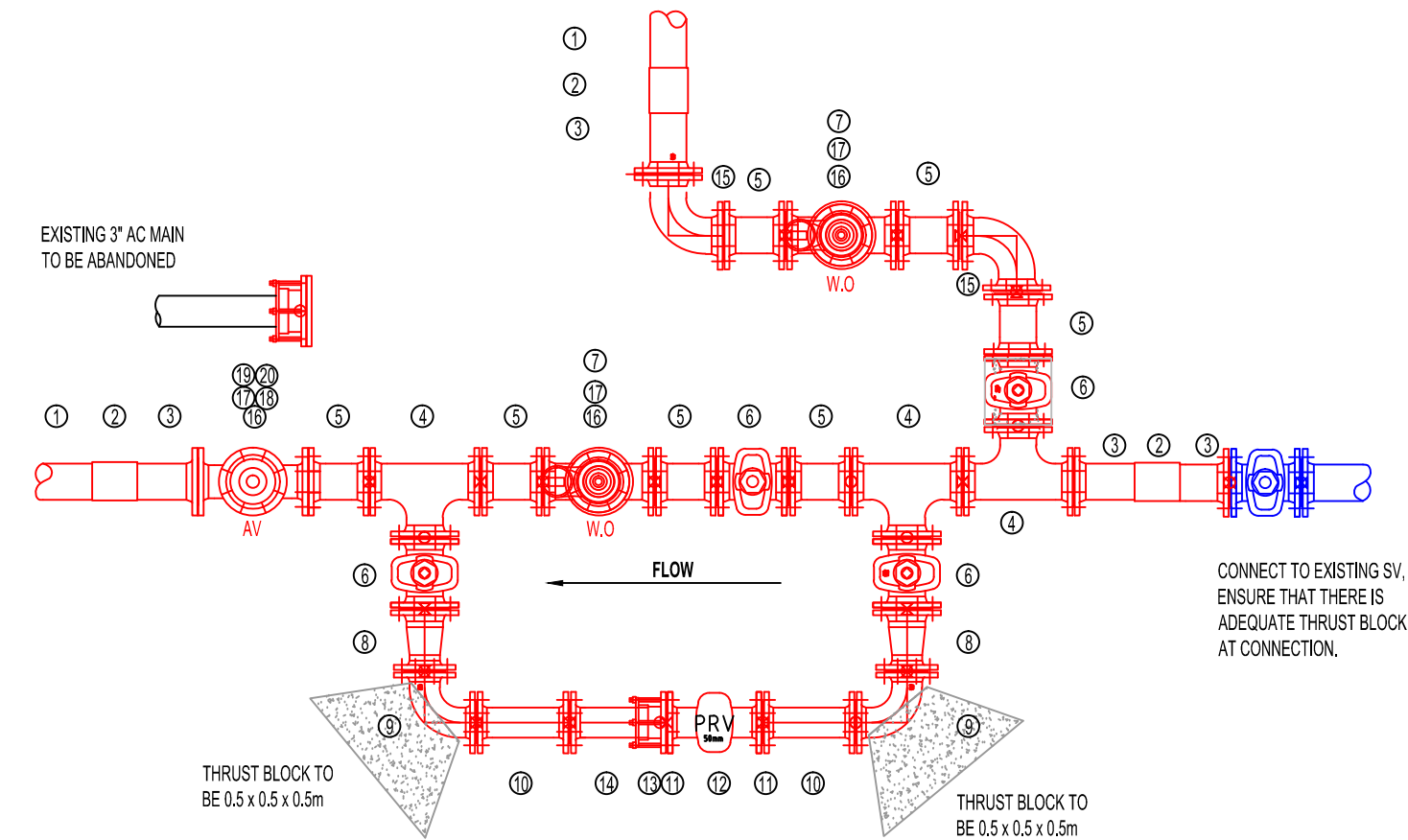
CHURCH STREET, TREMADOG  
GRID REF: 256193,340133 - 256208,340081  
TMA:  
METHOD OF CONSTRUCTION: OPENCUT  
DURATION: 4 WEEKS  
SAP ID: 9315534460

NOTE:  
RED LINE INDICATES APPROXIMATE POSITION OF PROPOSED MAIN



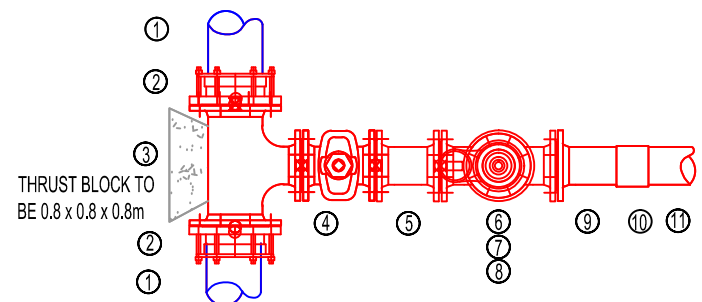
1:1250

ROUTE PLAN  
SCALE 1:1250  
GRID REFERENCE: 256187,340149



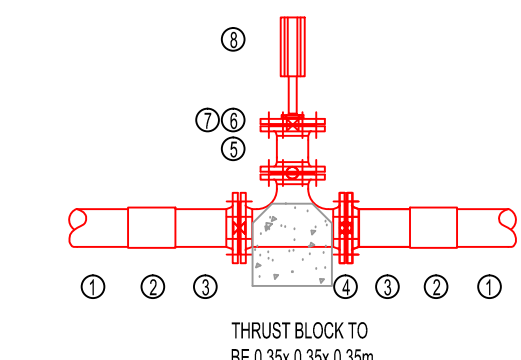
DETAIL 'A'

1.	110mm od 16 BAR PROFUSE PIPE	-
2.	110mm od ELECTROFUSION COUPLER	3
3.	110mm od PUPPED FLANGE	4
4.	100*100*100mm DIA A.F TEE	3
5.	100mm DIA AF DISTANCE PIECE 250mm LONG	7
6.	100mm DIA SLUICE VALVE C.C	3
7.	MM FIRE HYDRANT / WASHOUT	2
8.	100mm TO 80mm A.F TAPER	1
9.	80mm DIA ALL FLANGE 90° BEND	2
10.	80mm DIA DISTANCE PIECE 300mm LONG	2
11.	80mm TO 50mm DIA FLANGE CONVERTOR	1
12.	50mm DIA PRV NGE	1
13.	80mm DIA AQUAGRIP	1
14.	80mm DIA PUPPED FLANGE	1
15.	100mm ALL FLANGED 90 BEND	2
16.	100*100*90 mm ALL FLANGED TEE	2
17.	80mm DIA OF DISTANCE PIECE 250mm LONG	2
18.	80MM DIA BLANK PLATE D&T	1
19.	1" CHECK VALVE	1
20.	1" AIR VALVE	1



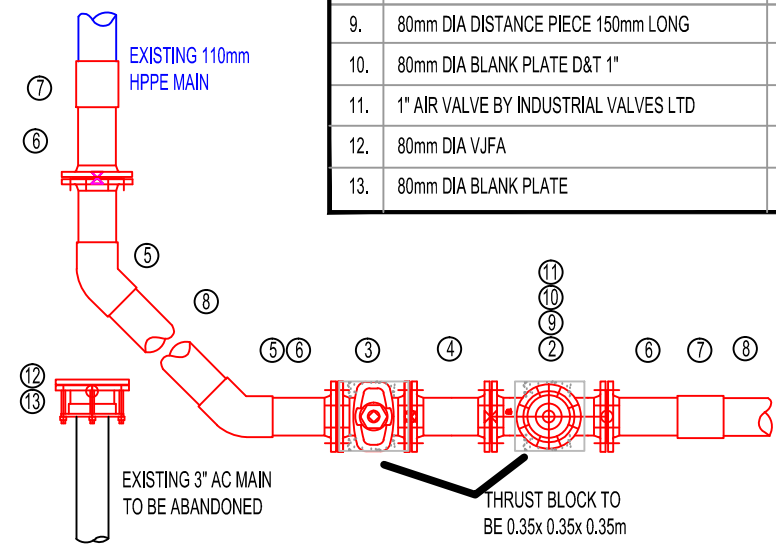
DETAIL 'B'

1.	EXISTING 5" DIA CI MAIN	-
2.	150-5" CI VJ FLANGED ADAPTOR	2
3.	100*150*150 MM AF TEE	1
4.	100 MM SLUICE VALVE C.C.	1
5.	100mm DIA AF DISTANCE PIECE 300MM LG	1
6.	80*100*100MM AF TEE	1
7.	80 MM AF DISTANCE PIECE 250 MM LG	1
8.	WASHOUT HYDRANT	1
9.	110 mm OD PUPPED FLANGED	1
10.	110mm OD ELECTROFUSION COUPLING	1
11.	110 MM OD 16 BAR HPPE PIPE	-



DETAIL 'C' x 2

1.	110mm od 16 BAR PROFUSE PIPE	-
2.	110mm od ELECTROFUSION COUPLER	2
3.	110mm od PUPPED FLANGE	2
4.	80mm OFF 100mm DIA ALL FLANGE TEE	1
5.	80mm DIA DISTANCE PIECE 150mm LONG	1
6.	80mm DIA BLANK PLATE D&T	1
7.	1" CHECK VALVE	1
8.	1" AIR VALVE	1



DETAIL 'D'

1.	NOT USED	-
2.	80mm OFF 100mm DIA ALL FLANGE TEE	1
3.	100mm DIA SLUICE VALVE C.C	1
4.	100mm DIA DISTANCE PIECE 250mm LONG	1
5.	110mm od ELECTROFUSION 45° BEND	2
6.	110mm od PUPPED FLANGE	2
7.	110mm od ELECTROFUSION COUPLER	2
8.	110mm od 16 BAR PROFUSE PE PIPE	-
9.	80mm DIA DISTANCE PIECE 150mm LONG	1
10.	80mm DIA BLANK PLATE D&T 1"	1
11.	1" AIR VALVE BY INDUSTRIAL VALVES LTD	1
12.	80mm DIA VJFA	1
13.	80mm DIA BLANK PLATE	1

A1

- NOTES:
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE FOLLOWING DOWN SPECIFICATIONS:
  - THE CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY REVISION 6 (CESWI 6)
  - ALL FLANGES TO BE NP16 RATED.
  - ALL PROFUSE PIPE AND FITTINGS TO BE SDR11 16 bar RATED.
  - ALL MOPE PIPES AND FITTINGS TO BE 16 BAR RATED.
  - REFER TO DRAWING SD101 FOR THE FOLLOWING DETAILS:  
FIRE HYDRANT, AIR VALVE, SLUICE VALVE AND PRV CHAMBER DETAILS, TIMBER POST STOCK PROOFENCE DETAIL, INDICATOR AND MARKER POST DETAIL, TYPICAL THRUST BLOCK DETAILS.
  - TRENCH DETAILS / REINSTATEMENT TO BE AS DRAWING SD102 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 SD101 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 1 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 2523mm MOPE. TO BE INSTALLED BY OPEN CUT, MOLING OR SLIP LINING AS APPROPRIATE. ESTIMATED NUMBER OF RESIDENTIAL TRANSFERS - 19.
  - CAUTION - CABLES, OVERHEAD CABLES ARE PRESENT WITHIN THE WORKING AREA. CONTRACTOR TO REFER TO HSE GUIDANCE NOTE GS6 "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 MAINS IS TO BE IN ACCORDANCE WITH THE NATIONAL JOINT UTILITIES GROUP GUIDELINES (JUG 67).
  - WORKING PRESSURE ON THIS PROJECT IS 8 BAR. TEST PRESSURE IS 12 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. 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.
  - ALL VALVES AND VERTICAL TEES REQUIRE SUPPORT BLOCKS. CONCRETE TO BE POURED AGAINST UNDISTURBED SOIL AND PLACED SO THAT VALVES WILL BE ACCESSIBLE FOR REPAIRS OR REPLACEMENT
  - LOCATION OF CONNECTIONS TO BE DETERMINED BY THE CONTRACTOR ON SITE.

KEY:

- Existing water main
- Abandoned water main
- Water main to be abandoned
- Proposed water main - Opencut
- Proposed water main - Directional Drill
- Proposed water main - Pipeburst
- Proposed water main - Slipline
- Existing Communication Pipe
- Proposed Communication Pipe
- Contractors Access
- Trial Hole Position
- SSSI, Scheduled Ancient Monument
- Contaminated Land
- Great Crested Newt Restrictions
- Archaeological Restrictions
- Badger Setts
- Mine Shafts

POST CODE LL49 9RB SAP No.

C	09.04.14	ET	CONSTRUCTION ISSUE	MK	HL	09.04.14
B	18.03.14	ET	CONSTRUCTION ISSUE	MK	HL	18.03.14
A	01.10.13	ET	TENDER ISSUE	MK	HL	01.10.13
Rev.	Date.	Drawn.	Description.	Checked.	Approved.	Date.

Drawing Status.

CONSTRUCTION ISSUE



CAPITAL DELIVERY TEAM  
ONE TALBOT GATEWAY  
BAGLAN ENERGY PARK  
SEAWAY PARADE  
BAGLAN  
PORT TALBOT  
SA12 7BR  
Tel: +44 (0) 1639 818800  
Fax: +44 (0) 1639 818844

Scheme. AMP 5 YEAR 5, MIPC  
NORTH AREA  
PENMORFA - TREMADOG.  
WATER MAIN RENEWAL

Drawing Title. PROPOSED SCHEME LAYOUT

Scale. AS SHOWN	Designer. E. Thomas
Checked. MK	Approved HL
Drawing Number. NP2900490 - 101	Date. 01.10.2013
	Rev. C



