Porth-Yr-Aur Promenade
Ground Investigation Works, Caernarfon

Archaeological Watching Brief

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

Porth-Yr-Aur Promenade Ground Investigation Works, Caernarfon

Archaeological Watching Brief

Project No. G2340

Report No. 1140

Prepared for: Ymgynghoriaeth Gwynedd Consultancy

August 2013

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SUMMARY

*Gwynedd Archaeological Trust (GAT) was commissioned by Ymgynghoriaeth Gwynedd Consultancy (YGC) to complete an archaeological watching brief in advance of proposed improvement works to the Porth-Yr-Aur promenade in Caernarfon, Gwynedd (centred on NGR **SH47706281**). The groundworks were completed between the 11th and 13th June 2013.*

*The original proposals were to undertake a series of ground investigation techniques to examine voids and services identified during a ground penetrating radar survey of the scheme zone. This was planned using a combination of Rotary Boreholes (4No), test pits (2No. hand excavated and 2No. machine excavated) and dynamic probing (5No). Test Pit TP1 was located within Scheduled Ancient Monument **Cn034** (Caernarfon Town Wall), beneath the Barbican arch, whilst the remaining test pits were located in close proximity to the wall. In response to circumstances, two boreholes were excavated to 0.70m by hand, whilst all the test pits were excavated by the geotechnical team by hand as a machine could not access the area. Test Pit 2 was also subdivided into two. As a result seven Test Pits: **TP1**, **TP2A**, **TP2B**, **TP3**, **TP4**, **BH1**and **BH2** were eventually opened.*

***TP1** revealed a well preserved cobbled surface immediately below the tarmac which was left intact. In the south east corner of **TP1**a vertical steel bar, similar to those used in reinforcement works was revealed and appeared to be in situ.*

***TP2A** revealed similar material composition as **TP2B**, **BH1**and **BH2**, with the north east corner of the pit opening into a void at least 1.00m square and containing a loose fill of broken bricks partly bound by a concrete layer.*

***TP2B**, **BH1** and **BH2** contained a large amount of demolition rubble used as backfill. Some of this rubble dated to the late nineteenth century repairs to Porth-Yr-Aur, recognisable by the distinctive red freestone used in this phase of building.*

***TP3** revealed the composition of the made ground used to infill behind the promenade wall.*

***TP4** revealed a slate capped drain running east-west from within the opening of an archway, the voussoirs of which are visible at the base of the town wall. The infill was similar to that encountered in **TP3**.*

The archaeological watching brief revealed that the late 19th century works carried out to convert Porth-Yr-Aur medieval town gate into the home of the Royal Welsh Yacht Club were extensive. At the same time as these works were being undertaken, the opportunity was taken to repair to try and stabilise the promenade where it extended westwards beyond the Barbican of Porth-Yr-Aur. A cobbled surface appears to have been laid at the same time within the Barbican to aid drainage from the High Street out through drains in the Promenade Wall Face.

*The steel reinforcement bar uncovered in the south east corner of **TP1** and the very disturbed and patched area which extends from inside the central passage of Porth-Yr-Aur to the Promenade wall suggests that the drainage exiting the town, of both surface and subsurface water has caused repeated problems at this point.*

*The archaeological watching brief on the Promenade to the north of Porth-Yr-Aur in **TP3** and **TP4** revealed only the most recent archaeological layers, with no evidence of the earlier construction phases of the Promenade when it served as the town quay.*

Further mitigation works will be required during the main Promenade works in order to be able to further contextualise any archaeology which may be encountered below the late 19th century works.

1. INTRODUCTION

Gwynedd Archaeological Trust (GAT) was commissioned by *Ymgynghoriaeth Gwynedd Consultancy (YGC)* to complete an archaeological watching brief during the ground investigation works to provide geotechnical information for the repair of the Porth-Yr-Aur promenade structure in Caernarfon, Gwynedd (centred on NGR **SH47706281**).

The site location and scheduled area are indicated in Figure 01. The scheme works are located on *YGC* Drawing Nos. **4185_GI_1** and **4185_GI_2** (reproduced as Figures 02 and 03) and detailed in the *YGC Porth-Yr-Aur Promenade GI Specification* (reproduced as Appendix II).

The Porth-Yr-Aur promenade is located close to Scheduled Ancient Monument **Cn034** (Caernarfon Town Wall) and the works were completed under Scheduled Monument Consent (reproduced as Appendix I).

According to the *YGC Porth-Yr-Aur Promenade GI Specification*:

- It is intended to repair and improve the Promenade and associated structures. The walls in front of the medieval town wall gatehouse towers are showing signs of distress and it is proposed to improve the stability of the structure by the use of permeation grouting from promenade level.

The ground investigation works were designed to investigate the existing promenade structure and underlying materials using the following:

- 4 No. Rotary Boreholes (BH01 to BH04) dug to 4m below ground level with permeability testing: designed to recover core representative of the ground conditions within the made ground of promenade structure and the underlying strata.
- 2 No. Hand Excavated Test Pits (TP1 and TP2) dug to 2m below ground level max: required to locate and identify a surface water drain (TP2) and an unknown service located by the GPR survey (TP1). Due to their location under and adjacent to the Barbican and the purpose of the inspection pits TP1 and TP2 were excavated by hand.
- 2 No. Machine Excavated Test Pits (TP3 and TP4) dug to 2m below ground level with a mini digger. These trial pits will not exceed 1m by 1.5m in area and 2m in depth.
- 5 No. Areas of Dynamic Probing. Dynamic Probing consists of driving a rod with an oversize point at its base into the ground with a uniform hammer blow. The blow count is recorded for every 100mm of driving (N100) and the results presented as a plot of blow count against depth. For the current project Dynamic Probing was used to test five areas of likely voids within the promenade structure.

The proposed GI areas are indicated *YGC* Drawing Nos. **4185_GI_1** and **4185_GI_2** (reproduced as Figure 01).

As was noted in the YGC GI Specification, the area around the Barbican where BH1 and BH2 were proposed was awkward in terms of access and space: in response to this, the bore holes were not completed using a drilling rig, but were excavated by hand as 0.50m wide pits, to a mean depth of 0.70m; Test Pit TP2 was also altered and was subdivided into two separate pits (2A and 2B) to help locate the relevant service (cf. para. 4.1 for further information). The two test pits that were to be machine excavated were excavated by *Strata Surveys* by hand, due to limited access.

1.1 Scheduled Monument Consent

The Scheduled Monument Consent (SMC) was granted by Cadw on 20/05/13 (reproduced as Appendix I). Cadw requires the following archaeological mitigation:

- Trial Pits

  Following removal of the modern surfacing, the pits should be excavated under archaeological supervision recording all archaeological features. All archaeological features and layers encountered during the investigations should be excavated by hand.

It should be noted that only Test Pit TP1 was located entirely within the scheduled area (within arched area of the Barbican); Test Pits TP2 to TP4 were located close to or against the scheduled area (TP2A was coterminous with the western end of the Barbican). The site location and scheduled area are indicated in Figure 01. The scheme works are located on *YGC* Drawing Nos. **4185_GI_1** and **4185_GI_2** (reproduced as Figure 02).

In reference to the boreholes, the SMC stated:

> Five boreholes are proposed to investigate anomalies detected by GPR survey and believed to represent voids adjacent to the harbour wall. *The proposed locations all lie close to but outside the present scheduled area but are in areas of historic/archaeological interest.* Application of this technique should be dependent upon the outcome of the trial pits in order to take account of potential for archaeological disturbance. One of the intentions of the borehole investigations is to attempt to confirm the line of the old harbour wall, if this is identified the information should be included in the final archaeological report.

Both Cadw and **Gwynedd Archaeological Planning Services** (GAPS) monitored this scheme. This report will need to be approved by Cadw and GAPS and has been completed in accordance with guidelines specified in *Standard and Guidance for Archaeological Watching Brief* (Institute for Archaeologists, 1994, rev. 2001 & 2008).

2. ARCHAEOLOGICAL BACKGROUND

2.1 Geology and Topographic description

The scheme is situated on the western side of the Town of Caernarfon, between the outfalls of the Afon Cadnant to the north and the Afon Seiont to the south, at a height of about 7m OD, on an area of made ground which forms part of the promenade around the western side of the town of Caernarfon (Figure 01).

The surrounding land slopes gently from the east from a height of about 15m OD, to where it meets the promenade wall constructed to the west of the town wall.

The drift geology is mainly glacial till, with a variable lithology over Llanvirn Rocks of Mudstone, Siltstone and Sandstone. http://mapapps.bgs.ac.uk/geologyofbritain/home.html.

2.2 Archaeological and historical background

2.2.1. Prehistoric and Roman sites

The area around Caernarfon has some evidence for land use in the prehistoric period, however within the confines of the medieval town and the suburbs no archaeological evidence has been recorded to date.

The Roman fort of *Segontium* (PRN 3089; Scheduled Ancient Monument (SAM) CN006; **SH48536240**) is 680m south east of the medieval town and a series of excavations have been carried out in this area from at least the 19th century to excavations in 2013. Associated with *Segontium* is Hen Waliau (PRN 3090; SAM CN094; **SH48256240**), a late Roman supply complex. A series of Roman Roads arrive at *Segontium* from Roman forts at Caerhun (PRN 662; SAM CN001; **SH77367037**); Caer Llugwy (PRN 799; SAM CN010; **SH74605725**) and Pen Llystyn (PRN 144; **SH48094492**) using the higher ground to the south and east of the medieval town.

2.2.2 Medieval

An Early Medieval square barrow cemetery was identified at Tyddyn Pandy to the south east of the Medieval town in 2006 (NPRN 404650; **SH48976238**) and was subsequently excavated by GAT in 2010. The current incarnation of Caernarfon Castle, constructed from 1283 onwards (PRN 3095; SAM CN079; **SH47836266**), partly overlies an earlier motte and bailey castle constructed sometime after 1066 (PRN 5058; **SH47846267**). The associated medieval town walls (PRN 3096; **SH47806286**) along with the castle are a UNESCO World Heritage Site inscribed in 1986 (http://whc.unesco.org/en/list/374).

2.2.3 Post-Medieval and Modern

Caernarfon expanded to cover an area to the north, east and south of the original walled town in the late and post-medieval periods. This expansion saw rebuilding or replacement of the medieval properties within the town walls, for example Plas Bowman, with a date stone of 1652 on the Church Street front (Haslam *et. al.* 2009: 307, the Market Hall, Palace Street of 1832 (Haslam *et. al.* 2009: 306) and the wholesale redevelopment of Shirehall Street and the southern half of Castle Street as Gwynedd Council Offices between 1982 and 1986 (Haslam *et. al.* 2009: 303).

A watching brief was completed to the east of Porth-Yr-Aur in 1995 by GAT during street improvement works (Jones, S. 1995. GAT Report **174**). GAT monitored a culvert trench that

ran in an approximately west-east direction from the north-western corner of the arch at Porth-Yr-Aur along the northern side of High Street to just east of the junction with Church Street where it crossed to the southern side of the street. It was between 0. 7m to 1.1m deep and approximately 0.8m wide. The area excavated directly east of Porth-Yr-Aur was recorded as very heavily disturbed by recent service pipes. However, approximately 20m to the east an orange/brown sandy clay, interpreted as natural glacial till, appeared at a depth of 0.6m rising to 0.4m further east. This was overlain by made ground of grey/brown clayey silt which contained fragments of slate, bone and shells, but less than recorded in a similar context elsewhere along High Street. Overlying this, at a depth of approximately 0.1m, was the remains of a cobble surface very similar to the cobbled road surfaces found in Church Street. Further to the east along the main culvert trench the orange brown sandy clay appeared to be higher in the north facing section as opposed to the south facing section, possibly reflecting the previous camber of the road.

3. METHODS AND TECHNIQUES

The watching brief was undertaken on the 11th and 13th of June 2013. The weather was overcast with rain blowing in off the Menai Straits. Ground conditions were good underfoot. The GI works were completed by *Strata Surveys Limited*; a description of the GI methodology is included in para. 1.0, the archaeological mitigation results are listed in para 4.0, below and a reproduction of the *Strata Surveys Limited* GI logs are included in Appendix III.

- A written record of the test pit content and all identified features was completed via GAT pro-formas.

- All trenches were recorded photographically, with detailed notations and a measured survey. The photographic record was completed using a digital SLR camera set to maximum resolution in the JPEG format.

- All test pits were excavated by hand by *Strata Surveys Limited*.

4. WATCHING BRIEF RESULTS

4.1 Bore Holes

4.1.1 Bore Hole BH1

Dimensions: 0.50m (l) x0.50m (w) x 0.67m (d)

Distance from Scheduled Ancient Monument: Less than 0.50m

The confined nature of the planned location for **BH1** between the barbican of Porth-Yr-Aur and the promenade wall meant that a Bore Hole Drilling Rig could not be safely positioned in order to carry out this work.

In order to prove ground conditions in this location a test pit measuring 0.50m x 0.50m was opened in the planned location of **BH1** (Plate 01).

The upper layer of **BH1** was a low quality mid grey tarmac which was a maximum depth of 0.05m. Below this was a compacted layer which consisted of coarse sand, beach pebbles, gravel, mortar fragments and angular stones up to 0.15m (l) x 0.15m (w) x 0.10m (d). This layer continued to 0.67m when the maximum workable depth of the pit was reached.

4.1.2 Bore Hole BH2

Dimensions: 0.50m (l) x0.50m (w) x 0.70m (d)

Distance from Scheduled Ancient Monument: Less than 0.50m

The confined nature of the planned location for **BH2** between the barbican of Porth-Yr-Aur and the promenade wall meant that a Bore Hole Drilling Rig could not be safely positioned in order to carry out this work.

In order to prove ground conditions in this location a test pit measuring 0.50m x 0.50m was opened in the planned location of **BH2** (Plate 02).

The upper layer of **BH2** was a low quality mid grey tarmac which was a maximum depth of 0.05m. Below this was a layer which consisted of angular stones up to 0.40m (l) x 0.30m (w) x 0.10m (d), broken roofing slates and mortar fragments. This layer continued to 0.70m when the maximum workable depth of the pit was reached.

4.1.3 Bore Hole BH3

The results of **BH3** are recorded in the *Strata Surveys Limited* Borehole Log (Appendix II). This was not watched by GAT due to the confined size of the Bore Hole.

4.1.4 Bore Hole BH4

The results of **BH4** are recorded in the *Strata Surveys Limited* Borehole Log (Appendix II). This was not watched by GAT due to the confined size of the Bore Hole.

4.2 Test Pits

4.2.1 Test Pit TP1

Dimensions: 1.40m (l) x 0.90m (w) x 0.60.m (d)

Excavated within the confines of the Scheduled Ancient Monument

In order to locate a surface water drain, Test Pit **TP1** was opened within the Barbican of Porth yr Aur. The position was revised from that originally planned in the GI design and a smaller area was opened (Plate 03 original marked position / Plate 04 revised and excavated position). The pit was positioned to incorporate the northern eastern inner corner of the Barbican. The revised position was recorded by YGC but not provided to GAT by the date of the production of this report. The tarmac surface was broken with a jack hammer and excavated by hand.

The upper layer of **TP1** was a low quality mid grey tarmac which was a maximum depth of 0.05m thick. Immediately below this was a poured concrete layer of a thickness varying between 0.02 and 0.05m. This concrete had adhered to the underside of the tarmac, but did not adhere to the layer below.

Below this in the western half of the pit was a well laid cobbled surface, using rolled beach pebbles between and 0.05m (w) and 0.12m (l) (Plate 05). The cobbles were laid in such a way as to allow the water flowing westwards down High Street to pass through Porth-Yr-Aur and drain through holes provided in the Promenade Wall (Plate 06).

At this depth (0.08m) the surface water drain had not been located, and consequently a smaller pit 0.70m (l) x 0.30m (w) was excavated in the south eastern corner of **TP1** where the cobbled surface had previously been disturbed (Plate 07). This layer consisted of a dark brown clay sand with some gravels and re-deposited cobbles. In the southern edge of this pit a vertical metal rod was uncovered, and this appears to be a steel reinforcing bar, possibly associated with previous drainage or stabilisation works at this point. **TP1** reached a maximum depth of 0.60m.

4.2.2 Test Pit TP2A

Dimensions: 0.90m (l) x 0.40m (w) x 0.80m (d)

Distance from Scheduled Ancient Monument: Eastern edge of Test Pit was coterminous with the Western edge of the Scheduled Ancient Monument

In order to locate an unknown service, Test Pit **TP2A** was opened against the promenade wall. The position was revised from that originally planned in the GI design and **TP2A** and **TP2B** replaced the original, larger proposed TP2 (Plate 08). The revised position was recorded by YGC but not provided to GAT by the date of the production of this report. The tarmac surface was broken with a jack hammer and excavated by hand (Plate 09).

The upper layer of **TP2A** was a low quality mid grey tarmac which was a maximum depth of 0.05m thick. Below this was a dark grey to black tarmac 0.10m thick. Immediately below this in the western and southern area of the pit was a layer of mixed backfill containing low quality broken bricks of both light and dark (vitreous) shades of orange, broken pieces of a hard cement (smaller than 0.10m x 010m x 0.05m) and pieces of a thin, flexible black tarmac (smaller than 0.05m x 0.05m x 0.02m) .

The north eastern quarter of the pit opened via a hole approximately 0.15m square into a void. The void was examined with a torch and revealed that previous attempts had been made to fill it with broken bricks, broken pieces of a hard cement and a poured or pumped concrete layer, depth of which is was difficult to ascertain but was at least 0.10m. The minimum depth of the void from the visual inspection appeared to be 0.50m in depth, with a minimum length and width of 1.00m. **TP2A** reached a maximum depth of 0.80m.

4.2.3 Test Pit TP2B

Dimensions: 0.90m (l) x 0.40m (w) x 0.90m (d)

Distance from Scheduled Ancient Monument: Less than 2.00m

In order to locate an unknown service, Test Pit Test Pit **TP2B** was opened on the western edge of the Barbican of Porth Yr Aur. The position was revised from that originally planned in the GI design and TP2A and TP2B replaced the original, larger proposed TP2 (Plate 08). The revised position was recorded by YGC but not provided to GAT by the date of the production of this report. The tarmac surface was broken with a jack hammer and excavated by hand (Plate10).

The upper layer of **TP2B** was a low quality mid grey tarmac which was a maximum depth of 0.05m thick. Below this was a dark grey to black tarmac 0.10m thick. The layer beneath consisted of a dark brown sandy clay, fragments of a hard cement with angular inclusion and stones up to 0.05m x 0.05m x 0.03m. Two large worked pieces of stone were recovered from this fill. The service which the GI works wished to locate was found running north-south at a depth of 0.40m. At 0.90m a mortar spread was identified and sample taken for further study. **TP2B** reached a maximum depth of 0.90m.

4.2.4 Test Pit TP3

Dimensions: 1.00m (l) x 0.60m (w) x 1.43m (d)

Distance from Scheduled Ancient Monument: Less than 5.00m

In order to prove ground conditions, Test Pit **TP3** was opened in the surface of the promenade. The position was revised from that originally planned in the GI design and the revised position subsequently recorded by YGC but not provided to GAT by the date of the production of this report (Plate 11). The tarmac surface was broken with a jack hammer and excavated by hand.

The upper layer of **TP3** was a dark grey tarmac which was a maximum depth of 0.10m thick. Below this was made ground consisting of a dark brown clay sand binding together thin purple slate fragments, broken light orange bricks, coarse and angular gravel and mortar fragments. **TP3** reached a maximum depth of 1.43m.

4.2.5 Test Pit TP4

Dimensions: 0.95m (l) x 0.60m (w) x 0.85m (d)

Distance from Scheduled Ancient Monument: Less than 3.00m

In order to prove ground conditions, Test Pit **TP4** was opened in the surface of the promenade. The position was revised from that originally planned in the GI design and the revised position recorded by YGC but not provided to GAT by the date of the production of

this report (Plate 12). The tarmac surface was broken with a jack hammer and excavated by hand.

The upper layer of **TP4** was a dark grey tarmac which was a maximum depth of 0.10m thick. Below was made ground consisting of a dark brown clay sand binding together thin purple slate fragments, beach pebbles, angular and rounded gravels and mortar fragments.

At 0.50m the top of a drain capped with thin purple slates was encountered running east – west from inside the town walls. This visible width of this drain was 0.40m. The line of this drain is visible in the tarmac surface of the Promenade and leads to an archway visible in the town walls. Only the top central portion of this arch is visible. The drain was left undisturbed. **TP4** reached a maximum depth of 0.85m.

4.3 Dynamic Probes

The results of Dynamic Probes **P1** to **P5** are recorded in the *Strata Surveys Limited* Dynamic Probe Logs (Appendix IV). These were not watched by GAT due to the confined size of the Dynamic Probe Hole.

5. SUMMARY AND CONCLUSIONS

The archaeological watching brief that was completed in and around Porth-Yr-Aur and on the associated Promenade during ground investigation works has been able to elucidate some evidence about the latest phases of reuse and repair of both structures and also aid in understanding the overall chronology of the western side of the medieval town of Caernarfon.

The structure of the medieval west gate of the town of Caernarfon, now known as Porth-Yr-Aur was most recently repaired and renewed *c.*1870 by Sir Llywelyn Turner as the home of the Royal Welsh Yacht Club (Haslam et. al. 2009: 305). The repairs were extensive, and included renewing the windows, floors, roof and battlements (RCAHMW 1960: 154). Distinctive red freestone was used in this work, and can be seen most clearly on the east face of the building (G2340_047). Broken pieces of this freestone were found in **TP2A**, **TP2B**, **BH1** and **BH2,** suggesting that the Promenade was repaired at the same time as the works were carried out on Porth-Yr-Aur (G2340_023)

During the repair works to Porth-Yr-Aur by Sir Llywelyn Turner, the central passageway was vaulted in brick (RCAHMW 1960: 154). This vaulting has now been covered with a hard cement render (G2340_063). The type of bricks used is now no longer visible, but light orange and dark orange vitreous bricks were found in **TP2A**, which may have also been used to carry out promenade repairs.

Only the most recent layers of the construction of the Promenade were encountered in **TP3** and **TP4**. The thin purple slates used for capping the drain found in **TP4** are most likely to have come from the Penrhyn Quarry and aid in part in dating the drain to post 1800, when these beds were being exploited.

The Cobbled Surface found in **TP1** is not visible on any of the photographs examined during the research for this report. The most likely date for their laying is during the renewal and repair of Porth-Yr-Aur in the 1870s, as they would have aided the east- west surface water drainage of High Street. The holes in the promenade wall to the north west and south west of Porth-Yr-Aur would have allowed this water to run into the sea. The very disturbed and patched area which extends from inside the central passage of Porth-Yr-Aur to the Promenade wall suggests that the drainage exiting the town, of both surface and subsurface water has caused repeated problems at this point, as visible by the steel reinforcement bar uncovered in the south east corner of **TP1**.

Further archaeological mitigation will be required during the main improvement works in order to be able to further contextualise any archaeology which may be encountered below the late 19th century works identified.

6. BIBLIOGRAPHY

IFA 1994 *Standard and Guidance for Archaeological Desk-based Assessment* (rev. 2001 and 2008).

Haslam, R., Orbach, J. and Voelcker, A. 2009 *Buildings of Wales: Gwynedd*, Yale, London.

RCAHMW 1960 *An Inventory of the Ancient Monuments in the County: Caernarvonshire Vol 2 Central*, HMSO, London

Ymgynghoriaeth Gwynedd Consultancy drawing Porth-yr-Aur Approximate Access Clearances and Working Area around Barbican 4185/GI/1

Ymgynghoriaeth Gwynedd Consultancy drawing Porth-yr-Aur 4185/GI/2

Gwynedd Archaeological Trust Historic Environment Record

Ordnance Survey maps:

1918 3rd Edition 25" County Series Ordnance Survey map of the area (Anglesey Series Sheet IV.3)

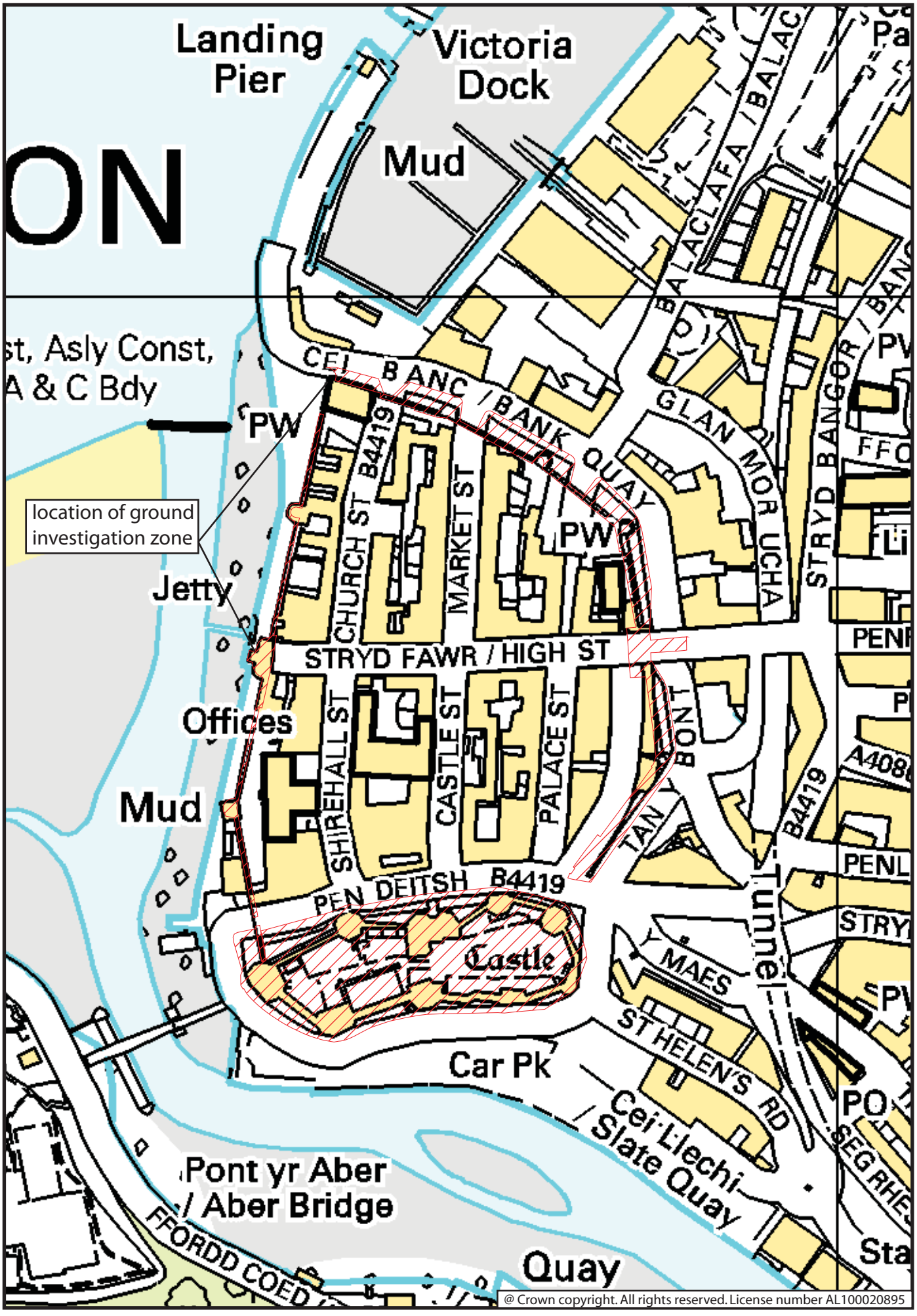
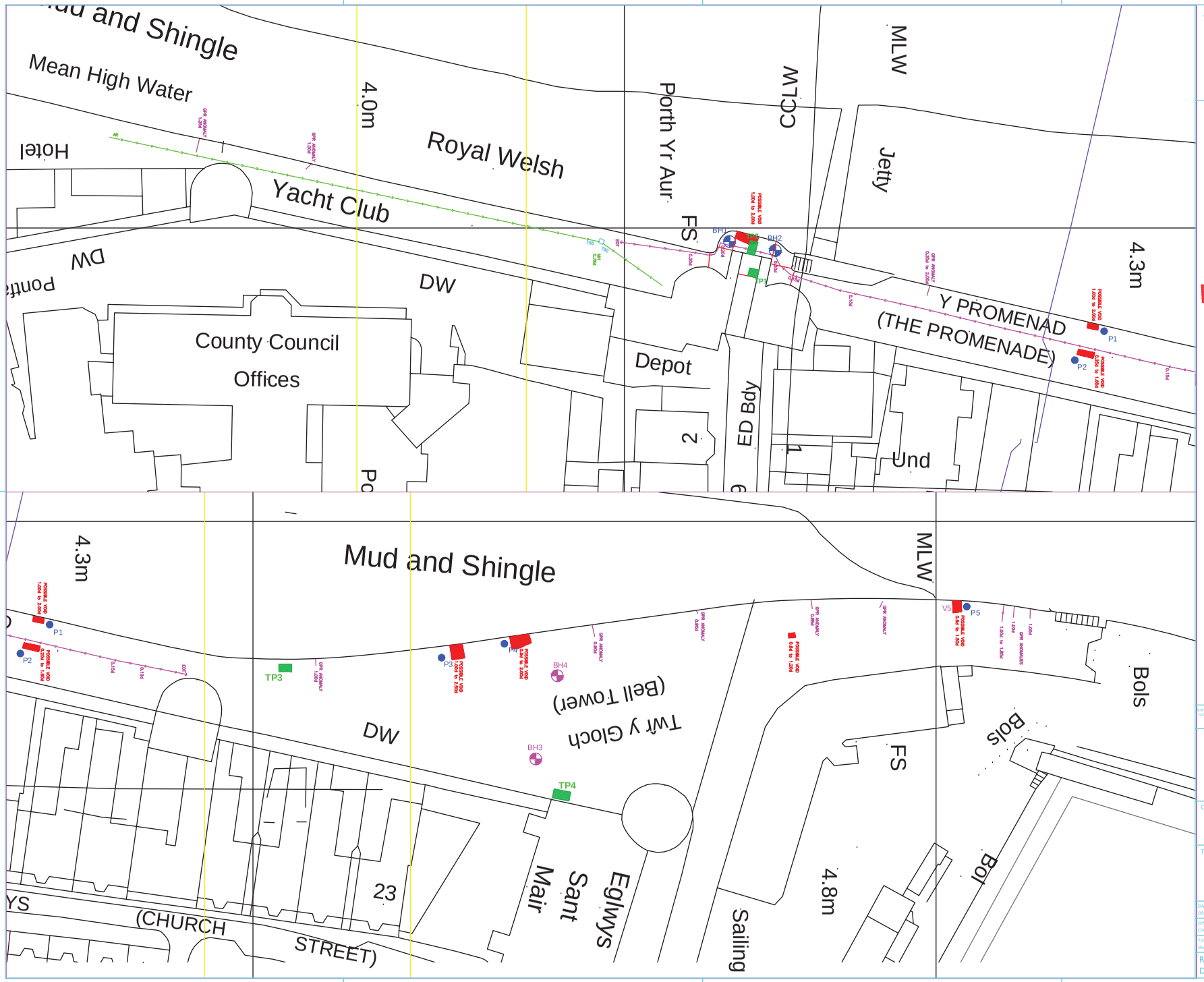


Figure 01: Location Map detailing ground investigation zone and scheduled area (highlighted red).
For detailed information on the location of the ground investigation zones, cf. Figures 02 and 03
Scale 1:2500@A4



CLEIENT/CLIENT :

NODIADAU/NOTES

KEY

BH2 Borehole

P1 Probe Hole

TP1 Trial pit

YGC Goe-Dechnegol / Geo-Technical

CYNGOR GWYNEDD COUNCIL

CYNLLUN / SCHEME :

Porth-yr-Aur 4185

TEITL LLUNIAD / DRAWING TITLE :

Borth-Yr-Aur Promenade
Ground investigation

DARLUNWYD GAN / DRAWN BY :	TSP	DYDDIAD DARLUNWYD / DATE DRAWN :	29/04/13
GWIRIWYD GAN / CHECKED BY :	GKD	DYDDIAD GWIRIWYD / DATE CHECKED :	16/05/13
Tudalen / Sheet	1 of 1	GRADDFEYDD / SCALES :	1/250@A1

Rhif Lluniad / Drawing No. 4185/GI/1

Figure 02: Reproduction of YGC Drawing 4185/GI/1 detailing ground investigation zones. Please note that Test Pit TP2 was subdivided into TP2A and TPB but utilised a similar footprint to that detailed; note also that Boreholes BH1 and BH2 were hand excavated by Strata Surveys

KEY

BH2 =Borehole

V1 =Void for probing activity

TP1 =Trial pit location

CLIENT/CLIENT :

NODIADAU/NOTES

YGC Goe-Dechnegol Geo-Technical

CYNGOR GWYNEDD COUNCIL

CYNLLUN / SCHEME :
Borth-Yr-Aur 4185

TBTL LLUNIAD / DRAWING TITLE :
Borth-Yr-Aur Promenade
Ground investigation

DARLUNIWYD GAN / DRAWN BY : TSP
DYDDIAD DARLUNIWYD / DATE DRAWN : 29/04/2013
GWIRIWYD GAN / CHECKED BY :
DYDDIAD GWIRIWYD / DATE CHECKED :
Tudalen / Sheet / o / of
GRADDFEYDD / SCALES :

Rhif Lluniad / Drawing No. GI005

Figure 03: Reproduction of YGC Drawing 4185_GI_005 detailing ground investigation zones.

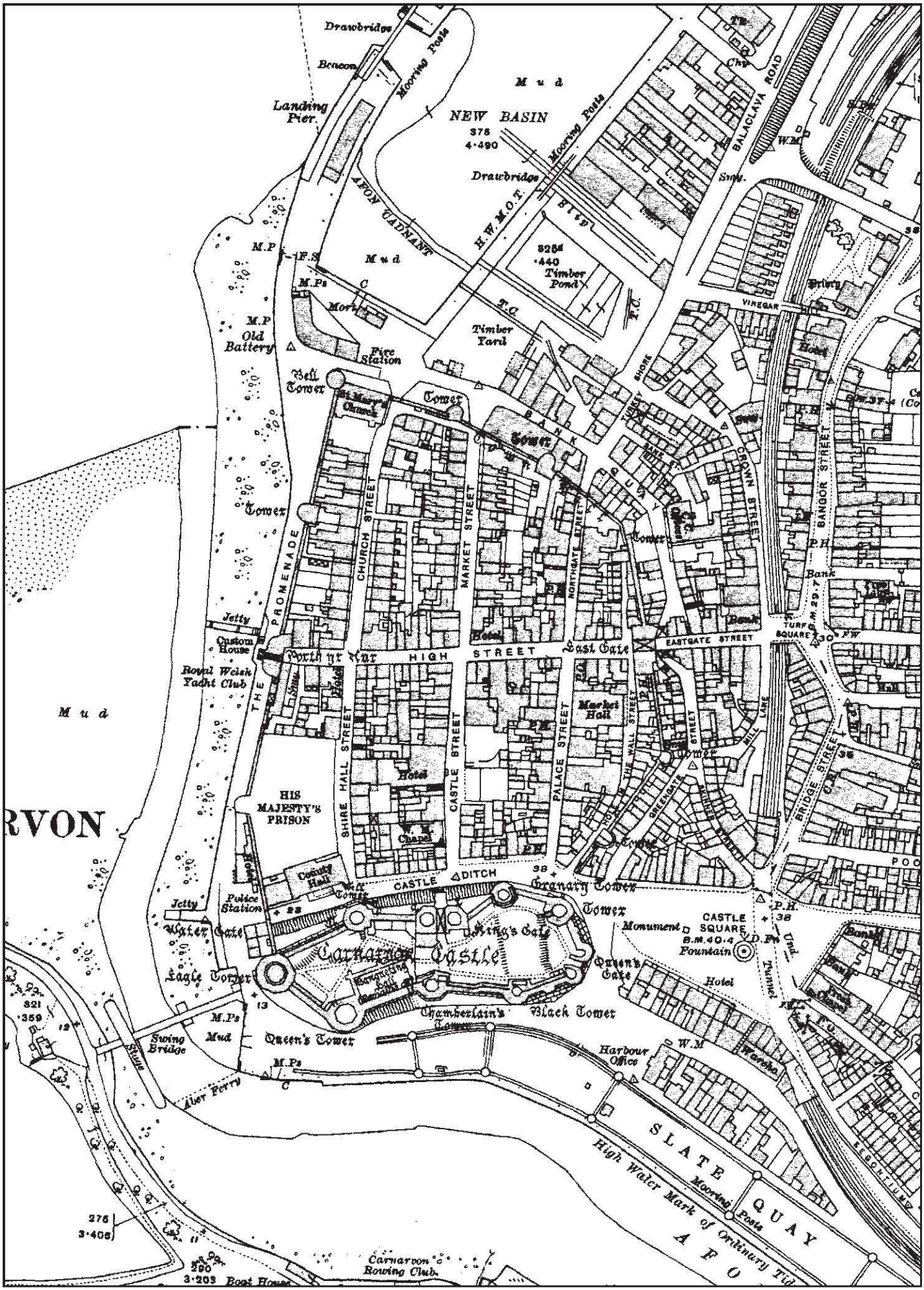


Figure 04: Reproduction of 1918 3rd Edition 25" County Series Ordnance Survey map of the area (Anglesey Series Sheet IV.3). Scale: 1:2500@A4

Plate 01 - Test pit measuring 0.50m x 0.50m opened in the planned location of BH1 (SH4766062853)

Plate 02 - Test pit measuring 0.50m x 0.50m opening the planned location of BH2 (SH4766762852)

Plate 03: Planned location of TP1 within the Barbican of Porth Yr Aur (SH4766462849).
Image Courtesy of Jenny Emmett, Gwynedd Archaeological Planning Services

Plate 04: Actual location of TP1 within the Barbican of Porth Yr Aur.

Plate 05: Intact cobbelled surface uncovered immediately below the tarmac in TP1 within the Barbican of Porth Yr Aur.

Plate 06: South western Drain Hole in wall of Promenade close to the Barbican of Porth Yr Aur
Image Courtesy of Jenny Emmett, Gwynedd Archaeological Planning Services

Plate 07: Test Pit opened in south eastern corner of TP1. The steel reinforcing bar is visible in the base of the test pit.

Plate 08: Revised locations of TP2A and TP2B. The proposed location of TP2 is visible as the white sprayed outline on the Tarmac (SH4766462852)

Plate 09: TP2A open in Porth Yr Aur Promenade showing the upper layers of the made ground behind the Promenade Wall and the opening of the void which extends northwards

Plate 10: TP2B open in Porth Yr Aur Promenade showing the location of the service running north-south across the Pit

Plate 11: TP3 open in Porth Yr Aur Promenade showing the upper layers of the made ground behind the Promenade Wall

Plate 12: TP4 open in Porth Yr Aur Promenade showing the upper layers of the made ground behind the Promenade Wall and the slate capped drain runnning east-west

APPENDIX I

Reproduction of Scheduled Monument Consent granted by Cadw on 20/05/13

Plas Carew, Uned 5-7 Cefn Coed, Parc Nantgarw,
Caerdydd CF15 7QQ
Ffôn 01443 33 6000 Ffacs 01443 33 6001
Ebost cadw@wales.gsi.gov.uk
Gwefan www.cadw.wales.gov.uk

Plas Carew, Unit 5-7 Cefn Coed, Parc
Nantgarw, Cardiff CF15 7QQ
Tel 01443 33 6000 Fax 01443 33 6001
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Web www.cadw.wales.gov.uk

Osian Richards
Gwynedd County Council
Shirehall Street
Caernarfon
Gwynedd
LL55 1SH

Eich cyfeirnod Your reference	
Ein cyfeirnod Our reference	KR
Dyddiad Date	20 May 2013
Llinell uniongyrchol Direct line	01443 336096
Ebost Email:	Suzanne.whiting@wales.gsi.gov.uk

Dear Mr Richards,

ANCIENT MONUMENTS AND ARCHAEOLOGICAL AREAS ACT 1979
SECTION 2 AND SCHEDULE 1
APPLICATION FOR SCHEDULED MONUMENT CONSENT
PROPOSED WORKS AT: CAERNARFON TOWN WALL (CN034)

I refer to your application dated 29 April 2013, for scheduled monument consent to carry out ground investigations at the site of the above scheduled ancient monument.

You declined the opportunity of appearing before, and being heard by, a person appointed for that purpose, afforded to you by Cadw in the letter dated 13 May 2013. Nor have you submitted any further representations in support of your case.

The proposed works can be carried out without detriment to the historic or archaeological integrity of the monument. Accordingly, the Welsh Government hereby grants scheduled monument consent for the works described at paragraph 4 of the application dated 29 April 2013, subject to the following conditions:

Trial Pits
Four trial pits are proposed. TP1 is within the outer section of the gateway passageway of Porth yr Aur, TP2 immediately in front of the gateway, TP3 and TP4 are on the promenade (TP3 alongside the harbour wall and TP4 will investigate a tarmac patch running away from the medieval town wall where a drain is believed to be located). All have the potential to expose archaeological remains and therefore need to be carried out under archaeological supervision. The proposed scale of investigation is approx.1m x 1.5m in size to a maximum depth of 2m. Following removal of the modern surfacing, the pits should be excavated under archaeological supervision recording all archaeological features. All archaeological features and layers encountered during the investigations should be excavated by hand.

Boreholes
Five boreholes are proposed to investigate anomalies detected by GPR survey and believed to represent voids adjacent to the harbour wall. The proposed locations all lie close to but outside the present scheduled area but are in areas of historic/archaeological interest. Application of this technique should be dependent upon the outcome of the trial pits in order to take account of potential for archaeological disturbance. One of the intentions of the borehole investigations is to attempt to confirm the line of the old harbour wall, if this is identified the information should be included in the final archaeological report.

On the information available, therefore, the Welsh Government is minded to grant scheduled monument consent, subject to the following conditions:

1. that Cadw shall be given at least two weeks notice, in writing, of the date of the commencement of the work or of any subsequent adjustment to this date, to allow Cadw's representatives to monitor on site activity;

2. that access to the site shall be afforded to representatives of Cadw;

3. that the applicant shall arrange for a professional archaeologist, who shall be approved, in writing, by Cadw, to carry out a watching brief during the excavation of the trial pits, and that no excavation shall take place without archaeological supervision;

4. that all archaeological levels or features shall be excavated by hand;

5. that any structural remains revealed during the excavation shall be preserved in situ and shall not be removed without written agreement from Cadw;

6. that prior to the back filling of the trial pits, the applicant shall arrange a site meeting with Cadw's representatives, the engineers and approved archaeologist to agree the level of record necessary and appropriate consolidation work (if required);

7. that all trial pits shall be reinstated to the landowner's satisfaction;

8. that within 2 months of the completion of the work, a report including appropriate descriptions, discussions, plans, section drawing and photographs shall be submitted to Cadw, to the National Monuments Record and to the Historic Environment Monuments Record held by Gwynedd Archaeological Trust;

9. that any modification to the proposed work shall require the written approval of Cadw, before it is undertaken; and

10. that Cadw shall be informed in writing immediately upon the completion of the works

Section 2(6) of the 1979 Act provides that non-compliance with a condition attached to a grant of scheduled monument consent shall be an offence.

By virtue of Section 4 of the 1979 Act if no works to which this consent relates are executed or started within 5 years from the date of this letter, the consent shall cease to have effect at the end of that period (unless it is revoked in the meantime).

This letter does not convey any approval or consent required under any enactment, bylaw, order or regulation other than Section 2 of the Ancient Monuments and Archaeological Areas Act 1979.

Your attention is drawn to the enclosed note (SMC19) which sets out your right to challenge the above decision.

Yours sincerely,

Suzanne Whiting
Diogelu a Pholisi/Protection and Policy
Enc. SMC19

APPENDIX II

Reproduction of Ymgynghoriaeth Gwynedd Consultancy Porth-Yr-Aur Promenade GI Specification

THE SPECIFICATION

The Specification for this ground investigation shall be the "Specification for Ground Investigation for Highway Works (Manual of Contract Documents for Highway Works Volume 5, Section 3, Part 4.)" published by the Stationery Office Ltd.

Schedules 1 to 5 of The Specification are given below.

SCHEDULE 1 – Information

1.1 Object and Scope of the ground investigation

A ground investigation is required to provide geotechnical information for the repair of the Porth-Yr-Aur promenade structure in Caernarfon, Gwynedd. A site location drawing is given below.

Figure 1. Site Location

Site locations and Requirements

Site Name	Road	Location (NGR)	GI proposed
Porth-Yr-Aur Promenade	N/A	247706 362817	4 No. Rotary Boreholes to 4mbgl with permeability testing. 2 No. Hand Excavated Pits to 2mbgl max 2 No. Machine Excavated Pits to 2mbgl 5 No. Areas of Probing

The Engineer is: YGC

The Client is: Gwynedd Council

The objective of the ground investigation is:

The production of a Factual Report containing a description of the Ground Investigation operation, exploratory hole logs, laboratory test results and a geotechnical description of soils and rocks.

All as specified in the specification, schedules, drawings and bills of quantities and as directed by the Engineer on site.

The scope of the ground investigation is:

It is intended to investigate the existing promenade structure and underlying materials using rotary coring, dynamic probing and trial pitting.

1.2 Description of the route or development

It is intended to repair and improve the Promenade and associated structures. The walls in front of the medieval town wall gatehouse towers are showing signs of distress and it is proposed to improve the stability of the structure by the use of permeation grouting from promenade level.

1.3 Schedule of Drawings

The drawings referred to in the ground investigation are:-

Site Name	Road	Drawing Number
Porth-yr-Aur	Promenade	4185/GI/1
Porth-yr-Aur	Promenade	4185/GI/2

1.4 General description of the site operations including ancillary works

Rotary Coring

It is proposed to drill four rotary boreholes to recover core representative of the ground conditions within the made ground of promenade structure and the underlying strata from ground level to approximately 4 metres depth. It is also intended to undertake two falling head permeability tests per borehole in boreholes 1 and 2.

It should be noted that the area around the portico where BH1 and BH2 are proposed is awkward in terms of access and space is limited, a detailed drawing with dimensions of this area is on 4185/GI/2 and there are photographs of the injevestigation area at the end of this Schedule.

There is also a need to maintain pedestrian access through or around the portico. These requirements should be included in any consideration of the type of plant to use.

The boreholes will be backfilled with cement grout.

Trial Pits

It is proposed to excavate two inspection pits and two trial pits to identify the location, type and condition of services, provide visual assessment of the ground conditions and provide bulk samples.

TP1 and TP2 are inspection pits required specifically to locate and identify a surface water drain (TP2) and an unknown service located by the GPR survey (TP1). Due to their location under and adjacent to the portico and the purpose of the inspection pits TP1 and TP2 will be excavated by hand.

It should be possible to excavate TP3 and TP4 with a mini digger. These trial pits will not exceed 1m by 1.5m in area and 2m in depth.

All inspection pits and trial pits shall be backfilled in compacted layers using the arisings and imported materials where necessary.

Dynamic Probing

A ground probing radar survey has located five areas of likely voids within the promenade structure. It is intended to confirm the presence of the voids using dynamic probing to a depth of 3m.

Reinstatement

The surface at all exploratory hole locations is tarmac which will require breaking out and reinstating to a similar condition.

Public Access

The Promenade is a popular pedestrian area and access must be maintained. It will be necessary to define the working area and prevent unauthorised access using Heras type fencing or similar approved fencing.

1.5 Geological formations likely to be encountered

The composition of the made ground used to construct the Promenade is not known but will be backfill retained behind the sea wall. There may be boulder clay present below the made ground. Rock may also be present at around foundation level and is likely to be Pre-Cambrian phyllites and chlorite schists.

1.6 List of affected landowners, tenants and occupiers

To be advised by CCBC

1.7. Form of Monthly Statement

Invoice.

1.8 Particular general requirements

The ground investigation shall be supervised and managed full time on site by a degree qualified Geotechnical Engineer or Engineering Geologist with a minimum of 5 years experience in ground investigation as discussed in Clause 2.2 item d of the specification.

The description of soil and rock shall be carried out by a geotechnical engineer or engineering geologist with at least 3 years post graduate experience in the examination and logging of soil and rock cores in accordance with:

- BS EN ISO 14688-1,2002 Geotechnical investigation and testing - Identification and classification of soil. Identification and description
- BS EN ISO 14688-2,2004 Geotechnical investigation and testing - Identification and classification of soil. Principles for a classification
- BS EN ISO 14689-1,2003 Geotechnical investigation and testing. Identification and classification of rock. Identification and description

The site investigation will be undertaken in accordance with:

- BS EN ISO 22475-1,2006 Geotechnical investigation and testing - Sampling methods and groundwater measurements.

- BS EN 1997-2-2007 - Eurocode 7 - Geotechnical design. Ground investigation and testing

All technical queries, including termination of boreholes, to be directed to The Engineer.

Please Note:

- The supervision and logging costs shall be included within the rates for the drilling and trial pitting operations in the Bill of Quantities for the Ground Investigation – See Clause 8 of the Preamble to the Bill of Quantities for the Ground Investigation.

- Positions and levels of all exploratory holes shall be surveyed as part of the investigation and the price for this is included in the drilling and trial pitting operations.

1.9 Particular borehole requirements

Not used.

1.10 Particular rotary drilling requirements

It is anticipated that core of Made Ground, Soil or Rock will need to be recovered. The area around BH1 and BH2 has limited space as shown on drawing 4185/GI/2

1.11 Particular pit and trench requirements

TP1 and TP2 are to be excavated by hand.

1.12 Particular sampling requirements

Sampling methods should be capable of obtaining categories of sample suitable for testing to meet the requirements of Eurocode 7 and be in accordance with EN ISO 22475-1.

1.13 Particular in-situ testing requirements

Permeability testing by falling head test is required at two depths in boreholes 1 and 2 only. The testing is needed to provide information for the proposed permeation grouting.

1.14 Particular instrumentation and monitoring requirements

None beyond those of the specification.

1.15 Particular laboratory testing requirements

None beyond those of the specification.

1.16 Particular reporting requirements

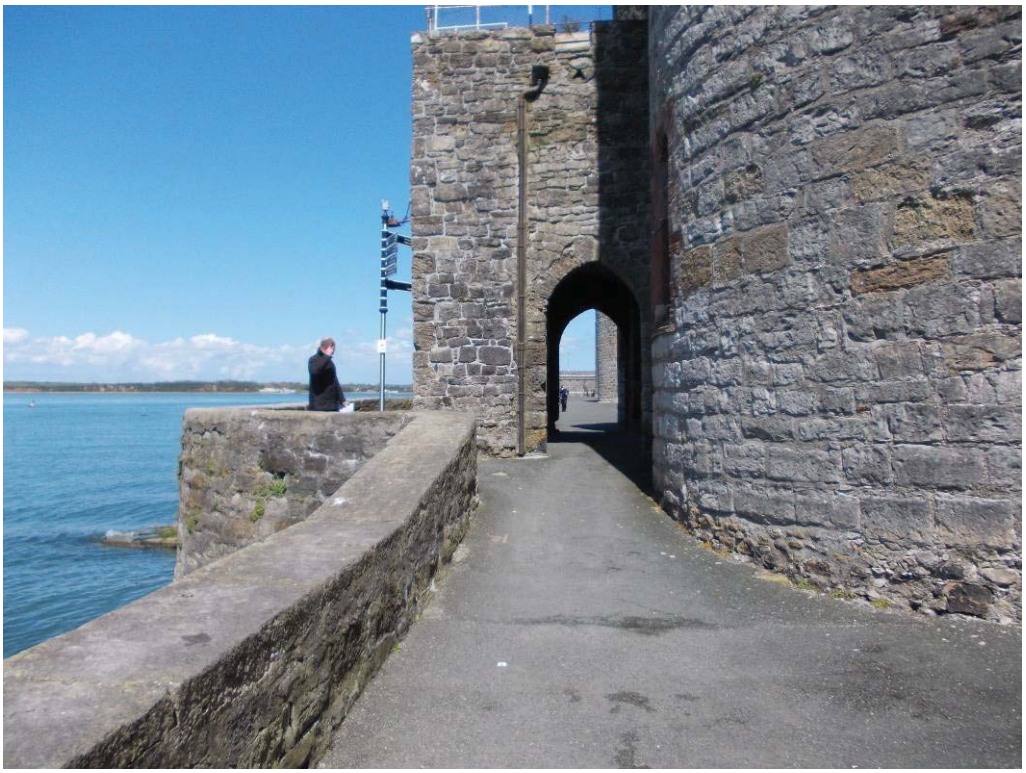
Daily records and engineers logs to be provided within specification requirements for provision of information to The Engineer.

The report will comprise a Factual Report and Digital Data.

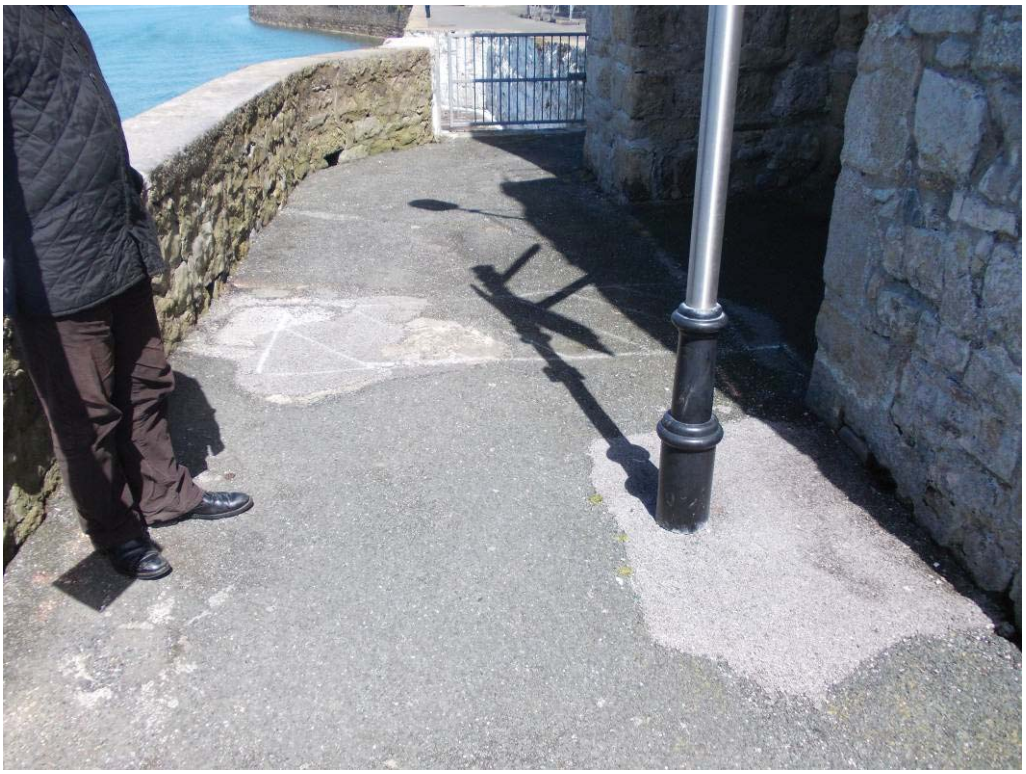
1.17 Particular requirements relating to potentially contaminated land

Not used.

PHOTOGRAPHS



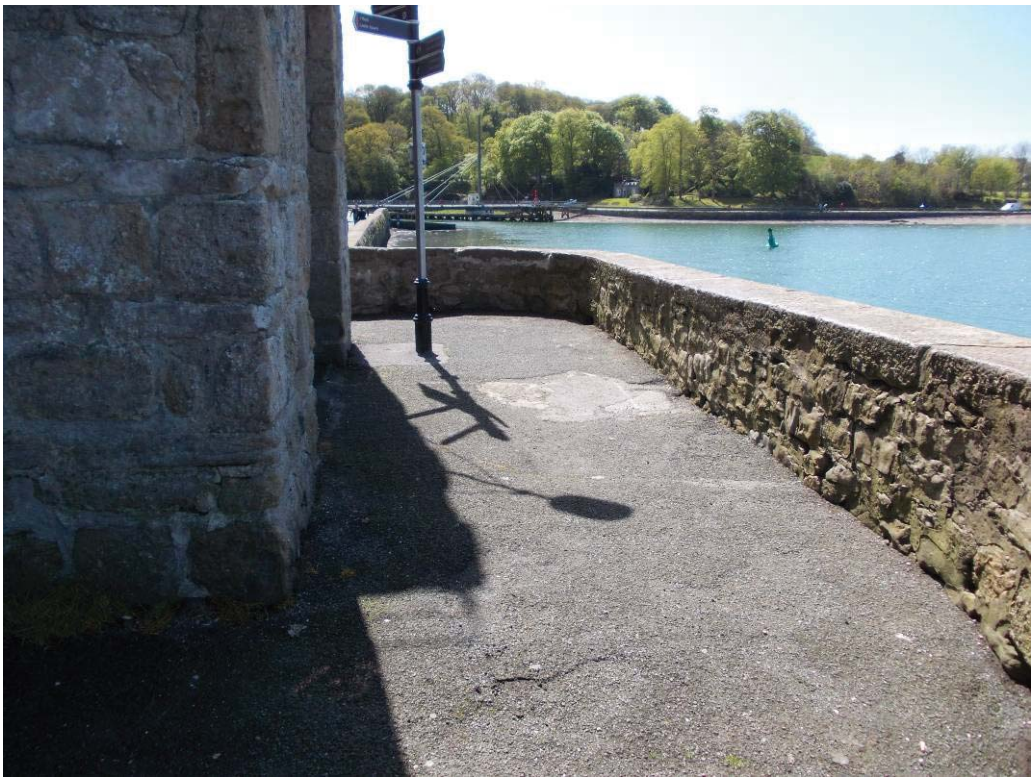
Promenade looking east towards the portico. BH1, BH2 and TP2 are located on the seaward side of the tower, TP1 is located in the archway beneath.



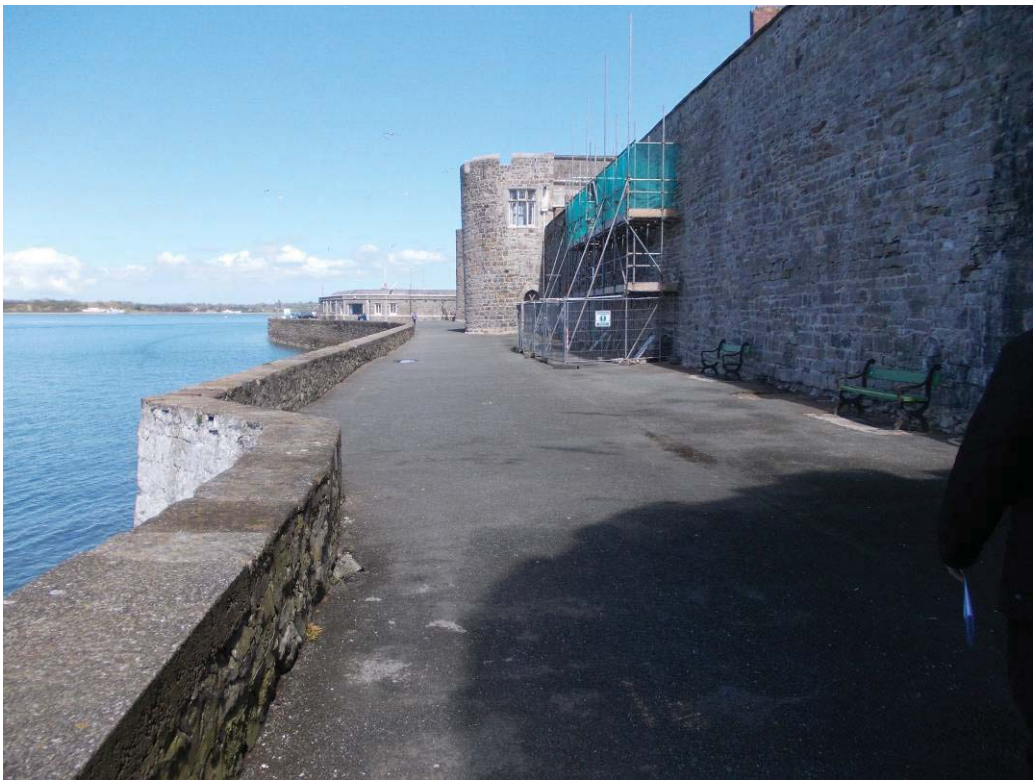
Seaward side of the portico looking east. TP2 is in white hatched area. BH1 is to the foreground of the photo. BH2 is towards the gate in the back ground.

Eastern side of the portico looking east showing narrow access.

Eastern side of the portico looking north west. Area of BH2.

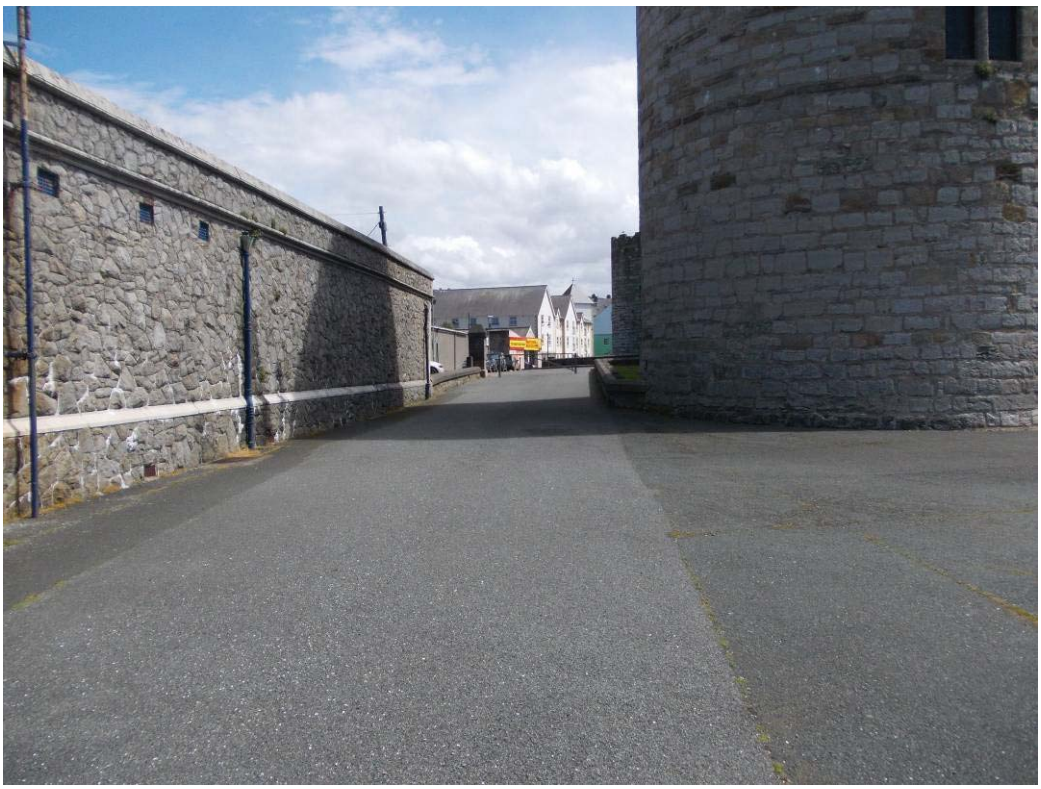


Seaward side of the portico looking west. BH2 is located to the foreground, BH1 to the background, TP2 to is between the boreholes.



From portico looking east along promenade. Area of P1 and P2

Looking east along promenade. Area of BH3, BH4, TP3, TP4, P3, P4 and P5



Access to promenade from Bank Quay (road).

SCHEDULE 2 – List of Exploratory holes

Borth-Yr-Aur Promenade GI Specification					
Exploratory hole ID	**Method**	**Depth (mBGL)**	**Location**	**Justification**	**NGR**
BH1	Rotary Core	4	Promenade portico	To prove ground conditions	247660 362853
BH2	Rotary Core	4	Promenade portico	To prove ground conditions	247667 362852
BH3	Rotary Core	4	Promenade	To prove ground conditions	247786 362821
BH4	Rotary Core	4	Promenade	To prove ground conditions	247790 362833
TP1	Hand Excavated	2	Promenade portico	To locate surface water drain	247664 362849
TP2	Hand Excavated	2	Promenade portico	To locate unknown service	247664 362852
TP3	Hand/Mini Digger	2	Promenade	To prove ground conditions	247750 362834
TP4	Hand/Mini Digger	2	Promenade	To prove ground conditions	247790 362815
P1	Dynamic Probe	3	Promenade	Confirm presence of void	247715 362840
P2	Dynamic Probe	3	Promenade	Confirm presence of void	247711 362836
P3	Dynamic Probe	3	Promenade	Confirm presence of void	247773 362835
P4	Dynamic Probe	3	Promenade	Confirm presence of void	247782 362837
P5	Dynamic Probe	3	Promenade	Confirm presence of void	247845 362843

All locations to be agreed and confirmed on site

SCHEDULE 3 – Engineers Facilities

Use of contractors office and welfare facilities during site visits

SCHEDULE 4 – Specification Amendments

Not Used

SCHEDULE 5 – Specification Additions

Not Used

PREAMBLES TO BILL OF QUANTITIES – GROUND INVESTIGATION

1. General Directions

In this Bill of Quantities, the sub-headings and item descriptions identify the work covered by the respective items read in conjunction with the matters listed against the relevant marginal headings 'Item Coverage' in Part IV of the Method of Measurement for Ground Investigation (Manual of Contract Documents for Highway Works Volume 5, Section 3, Part 6.) published by the Stationery Office Ltd.. The nature and extent of the work is to be ascertained by reference to the Drawings, Specification Schedules and Conditions of Contract.

The rates and prices entered in the Bill of Quantities shall be deemed to be the full inclusive value of the work covered by the several items including the following, unless expressly stated otherwise:

(i) Labour and costs in connection therewith

(ii) The supply of materials, goods, storage and costs in connection therewith including delivery to Site. Taking delivery of materials and goods supplied by others, unloading, storage and costs in connection therewith.

(iii) Fixing, erecting and installing or placing of materials and goods in position, including Ancillary Works.

(iv) Equipment and costs in connection therewith.

(v) General obligations, liabilities and risk involved in the execution of the Works set forth or reasonably implied in the documents on which the tender is based.

(vi) Establishment charges, overheads and profit.

(vii) Waste.

2. Measurement

The measurement of work shall be computed net from the agreed records unless stated otherwise in the Method of Measurement.

3. Pricing of Items

Each individual item shall have a rate or price entered against it. Rates and prices shall be expressed to two decimal places.

4. Privately and Publicly Owned Services or Supplies .

The Contractor shall include in his rates and prices for taking measures for the support and full protection of the pipes, cables and other apparatus during the progress of the Site Operations and for keeping the Engineer informed of all arrangements he makes with the owners of privately owned services Statutory Undertakers and Public Authorities as appropriate.

5. Labours

Labours in connection with nominated Sub-Contractors shall include:

(a) in the case of work or services executed, for affording the use of existing working space, access, temporary roads, erected scaffolding, working shelters, staging, ladders, hoists, storage, latrines,

messing, welfare and other facilities existing on Site and the provision of protection, water, electricity for lighting and clearing away rubbish and debris arising from the work:

(b) in the case of goods, materials or services supplied, for taking delivery, unloading, storing, protecting and returning crates, cartons and packing materials.

6. Work Within and Below Non-Tidal Open Water or Tidal Water.

The Contractor shall allow in his rates and prices for taking measures required to execute the work separately measured as being within and below non-tidal open water or tidal water. For the measurement of work affected by non-tidal open water or tidal water the datum stated in the Contract shall be used irrespective of the actual level encountered in the Site Operations.

7. Dealing with Flows.

The Contractor shall allow in his rates and prices for taking measures to deal with the existing flow of water, sewage and the like.

8. Schedule of Rates for Professional and Technical Staff

The schedule of rates for professional and technical staff shall be priced at the rates for the various grades of staff who will be employed in the preparation of interpretative and advisory section of the report, or employed for advisory work for the Engineer on site on the conduct of the investigation, as required by the Engineer.

This excludes the superintendence and technical direction required under Clause 1.8 of the Schedule to the Specification which must be covered by the rates and prices entered in the ground investigation Bill of Quantities.

9. Reimbursement by the Employer of Fees, Rates, Taxes, and Engineer's Telephone Calls.

The Employer will reimburse the Contractor the actual price paid by the Contractor in respect of:

(i) fees, rates and taxes - the sums certified by the Engineer as properly payable and repayable to the Contractor in accordance with Clause 26 of the Conditions of Contract.

(ii) Engineer's telephone calls - the telephone calls charged to the number or numbers allocated to the Engineer.

Any other costs, charge or expense in respect of these items shall be allowed for in the rates and prices for temporary accommodation.

10. Work on potentially contaminated land or on samples taken from potentially contaminated land.

The Contractor shall allow in his rates and prices for taking measures required to execute the work separately measured as being on potentially contaminated land or on samples taken from potentially contaminated land. The Contractor shall include in his rates prices for such work for submitting and resubmitting statements of working arrangements. Liaison with authorities and the Engineer, complying with hygiene and safety requirements, taking measures to control activities and complying with particular requirements, taking measures in handling and storage of material, complying with particular testing requirements, replacement of solid arisings in pits and trenches and disposing of surplus material to a suitably licensed site.

Amendments to Method of Measurement

Not Used

SCHEDULE OF RATES FOR PROFESSIONAL AND TECHNICAL STAFF

The rates entered below will be used by the Engineer to make an initial estimate of the cost of employing the Contractor's staff for the preparation of the interpretative and advisory section of the report and for advisory work for the Engineer on site on the conduct of the investigation where ordered. They will also be used for the costing of the final account showing the hours spent by the various grades of staff and their expenses, which will be submitted for the Engineer's agreement.

The Contractor will be required to maintain adequate records of the time spent by each grade of staff and their expenses.

The original time sheets and vouchers for expenses should be made available to the Engineer.

SCHEDULE OF RATES FOR PROFESSIONALS AND TECHNICAL STAFF

Description	Unit	Rate
Technician	Hour	
Incorporated Engineer	Hour	
Graduate Engineer/Geologist/Environmental Scientist	Hour	
Graduate Engineer/Geologist/Environmental Scientist with at least 3 years of relevant experience since graduation	Hour	
Chartered Engineer/Geologist/Environmental Scientist with at least 5 years of relevant experience	Hour	
Principal Chartered Engineer/Geologist/Environmental Scientist with at least 10 years of relevant experience	Hour	
Expenses incurred by staff on site visits or who are resident by agreement with the Engineer		
Fares per mile from permanent station and return for:		
a) Technician and Incorporated Engineer	per mile	
b) Graduate Engineer/Geologist/Environmental Scientist, Graduate E/G/ES with at least 3 years of relevant experience & Chartered E/G/ES with at least 5 years of relevant experience	per mile	
c) Principal Chartered Engineer/Geologist/Environmental Scientist with at least 10 years of relevant experience	per mile	
All other expenses incurred in connection with a site visit where a return journey is made on the same day for:		
a) Technician and Incorporated Engineer	per visit	
b) Graduate Engineer/Geologist/Environmental Scientist, Graduate E/G/ES with at least 3 years of relevant experience & Chartered E/G/ES with at least 5 years of relevant experience	per visit	
c) Principal Chartered Engineer/Geologist/Environmental Scientist with at least 10 years of relevant experience	per day	
All other expenses incurred in connection with a stay on site of more than 21 days for:		
a) Technician and Incorporated Engineer	per day	
b) Graduate Engineer/Geologist/Environmental Scientist, Graduate E/G/ES with at least 3 years of relevant experience & Chartered E/G/ES with at least 5 years of relevant experience	per day	

APPENDIX III

Reproduction of Strata Surveys Limited Ground Investigation Logs

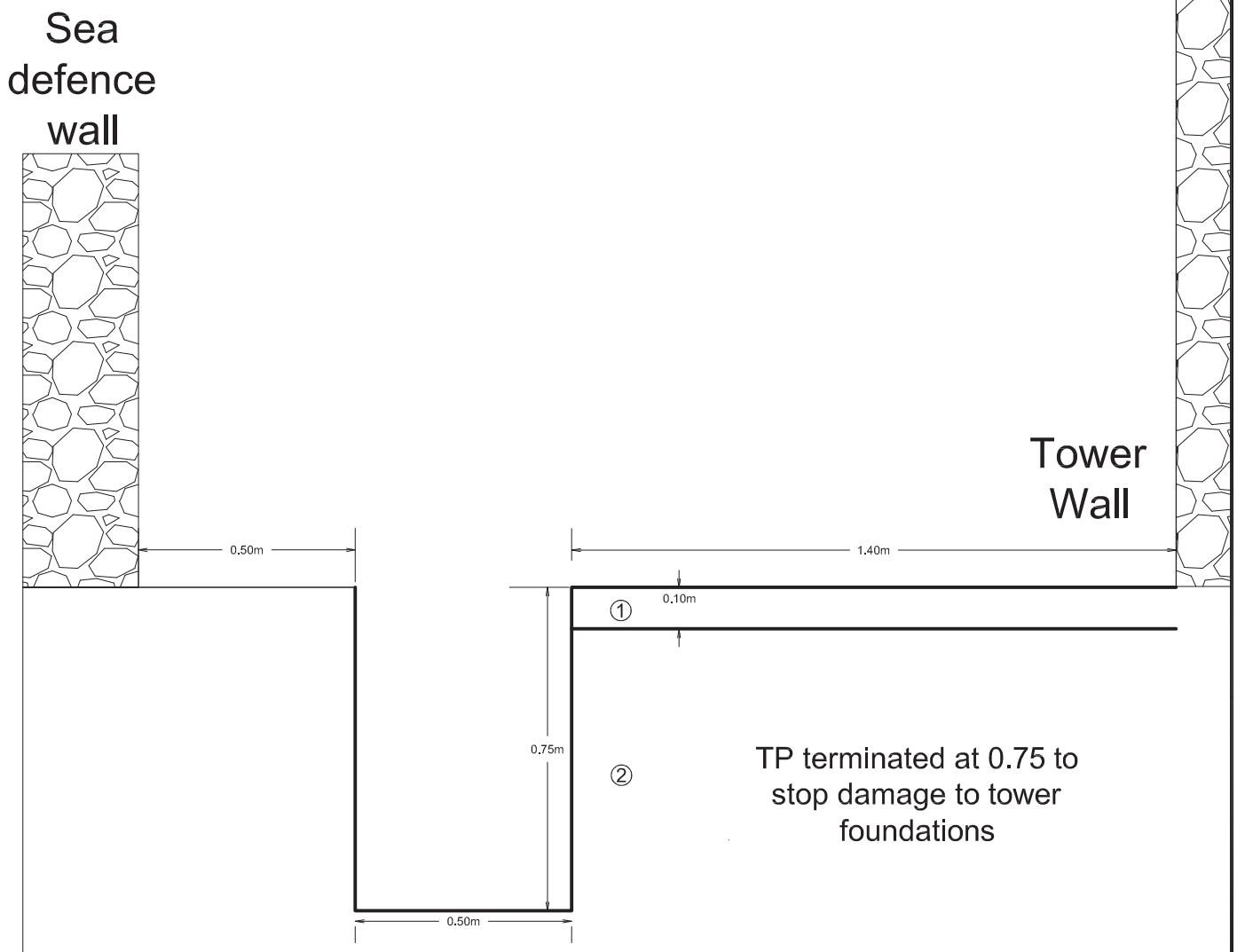
CLIENT : Gwynedd Consultancy
Job No.: 15695

Pit No. : BH01
DATE: 12/06/2013

LOCATION: PORTH YR AUR CAERNARFON

COMMENTS:

Section View



	Depth From	To	Soil Group	Soil Description
①	G.L	0.10	FILL	MADE GROUND (Tarmac surfacing)
②	0.10	0.75	FILL	MADE GROUND (Brown fine to coarse Sand and Gravel and cobble)
	0.75		FILL	MADE GROUND (Large blocks of sandstone with sand and gravel - possible part of foundations of tower)

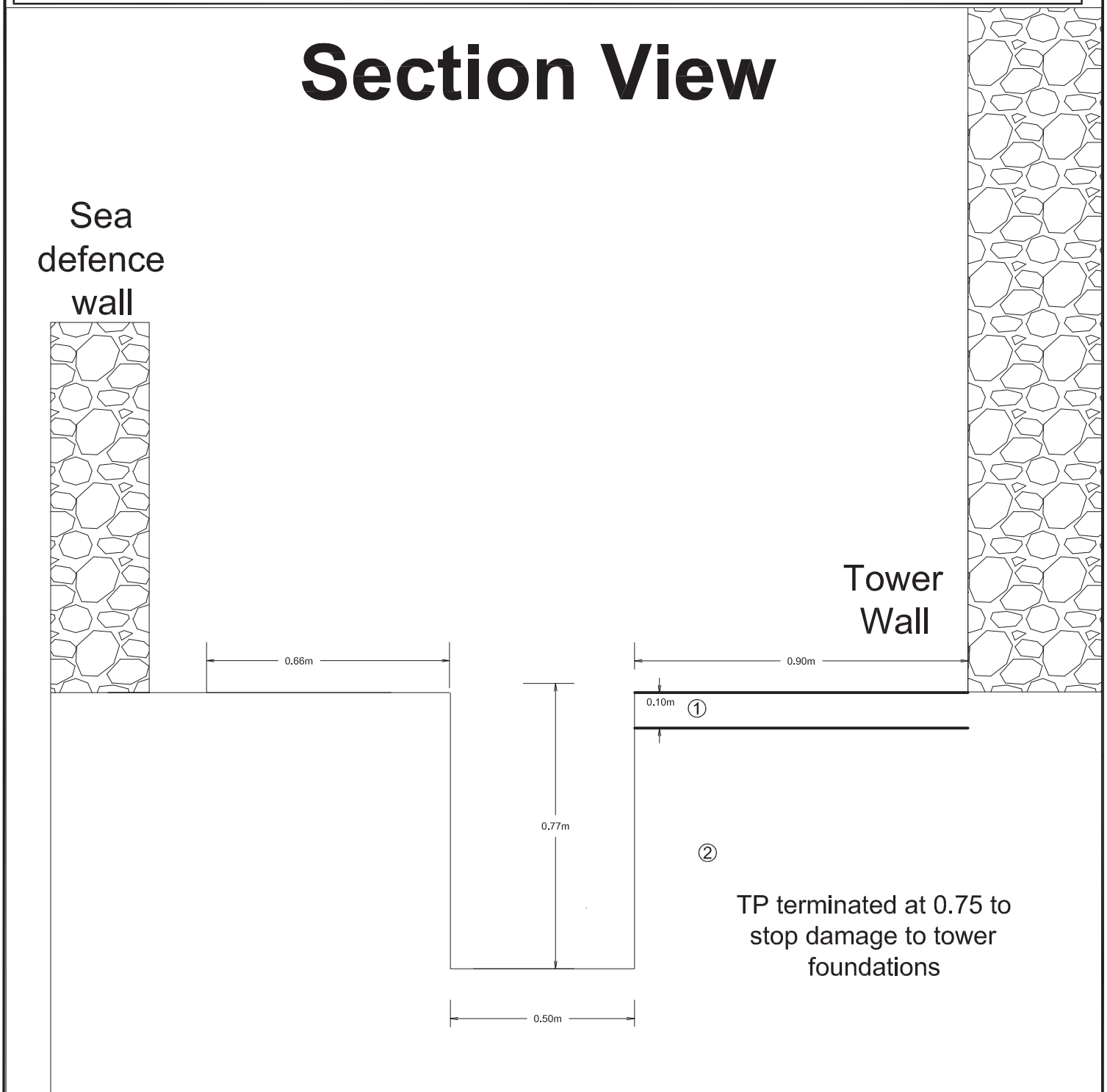
CLIENT : Gwynedd Consultancy
Job No.: 15695

Pit No. : BH02
DATE: 12/06/2013

LOCATION: PORTH YR AUR CAERNARFON

COMMENTS:

Section View



	Depth From	To	Soil Group	Soil Description
①	G.L	0.10	FILL	MADE GROUND (Tarmac surfacing)
②	0.10	0.75	FILL	MADE GROUND (Reddish brown fine to coarse Sand and Gravel and cobbles)
	0.75		FILL	MADE GROUND (Large blocks of sandstone with sand and gravel - possible part of foundations of tower)

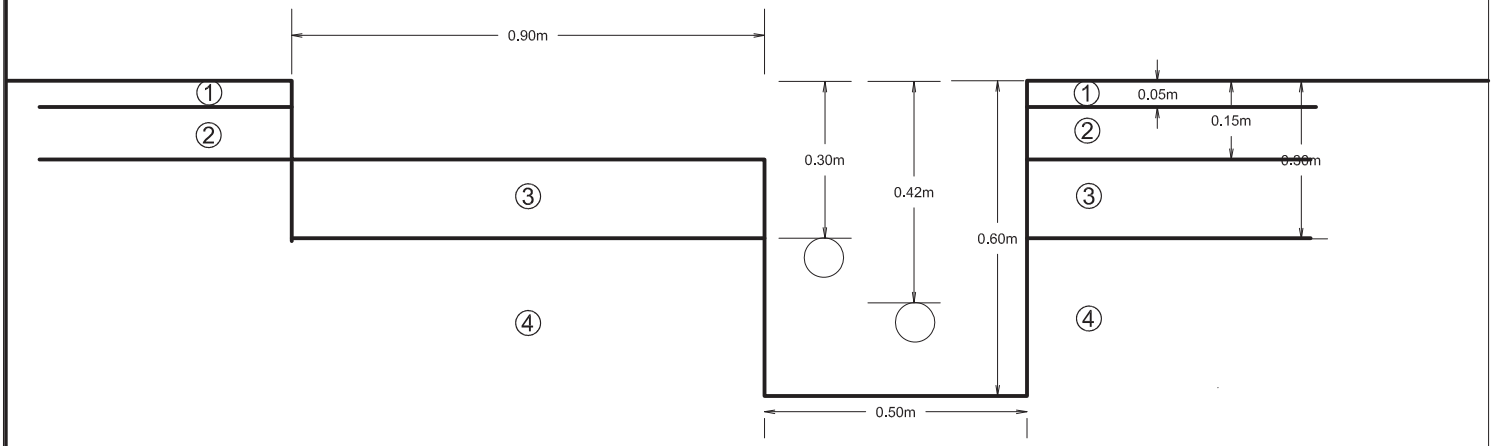
CLIENT : Gwynedd Consultancy
Job No.: 15695

Pit No. : 1
DATE: 12/06/2013

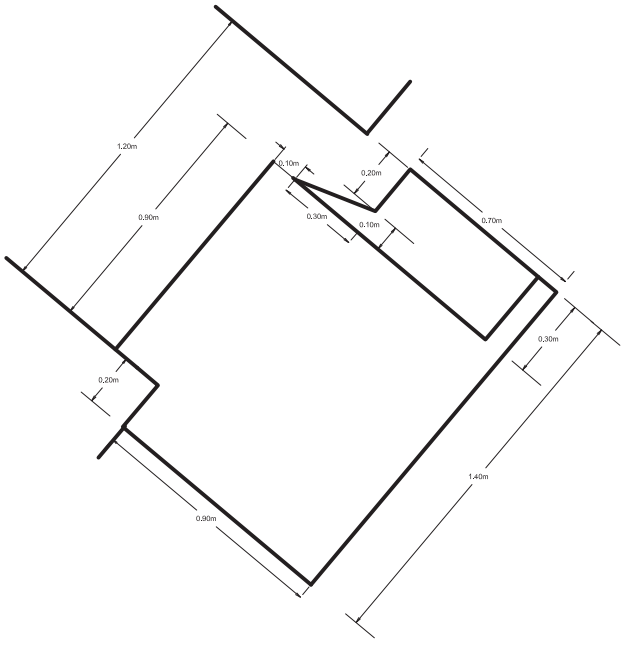
LOCATION: PORTH YR AUR CAERNARFON

COMMENTS: Old cobbled surface discovered geologist sketched/logged surface pit dug alongside and stopped at 0.6m

Section View



Plan View



	Depth From	To	Soil Group	Soil Description
①	G.L	0.05	FILL	Tarmac surfacing
②	0.05	0.15	FILL	Concrete
③	0.15	0.30	FILL	Dark brown slightly clayey gravelly SAND. Gravel is fine to coarse angular to rouned and of mixed lithologies.
④	0.30	0.60	FILL	Dark brown slightly clayey gravelly SAND. Gravel is fine to coarse angular to rouned and of mixed lithologies.

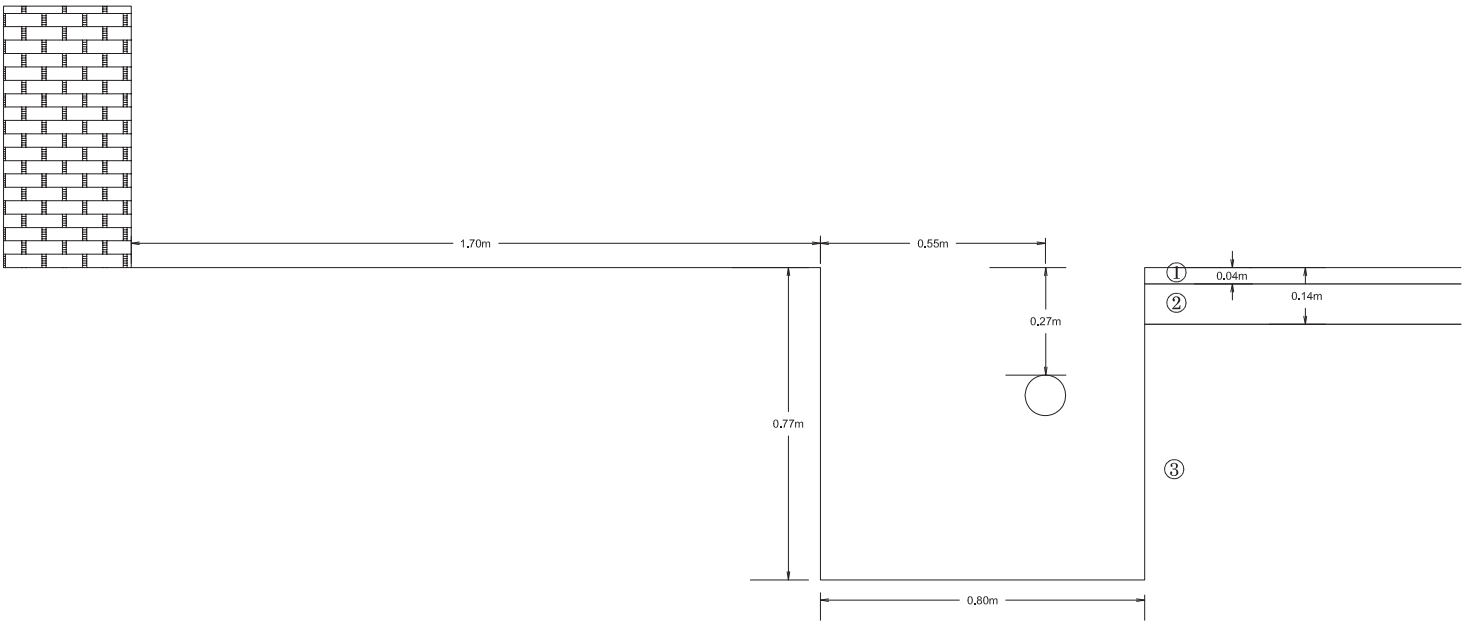
CLIENT : Gwynedd Consultancy
Job No.: 15695

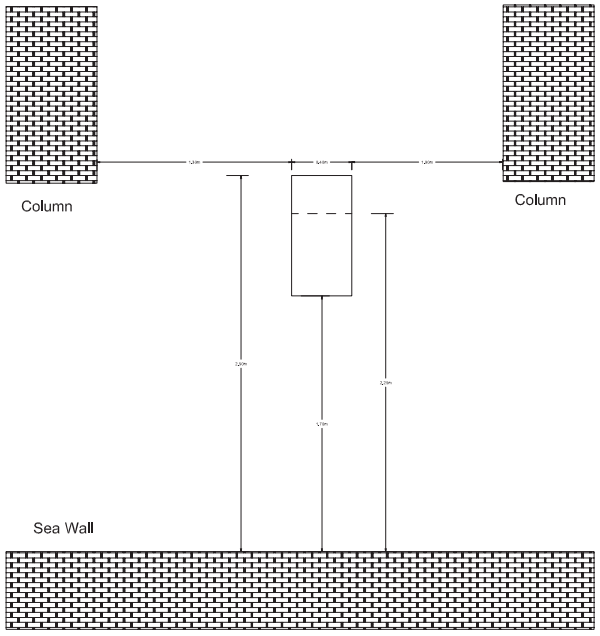
Pit No. : 2A
DATE: 11/06/2013

LOCATION: PORTH YR AUR CAERNARFON

COMMENTS:

Sea Wall





	Depth From	To	Soil Group	Soil Description
①	G.L	0.04	FILL	MADE GROUND (Tarmac surfacing.)
②	0.04	0.14	FILL	MADE GROUND (Ash Fill.)
③	0.70	1.00	FILL	MADE GROUND (Brown clayey fine to coarse SAND and fine to coarse GRAVEL.)

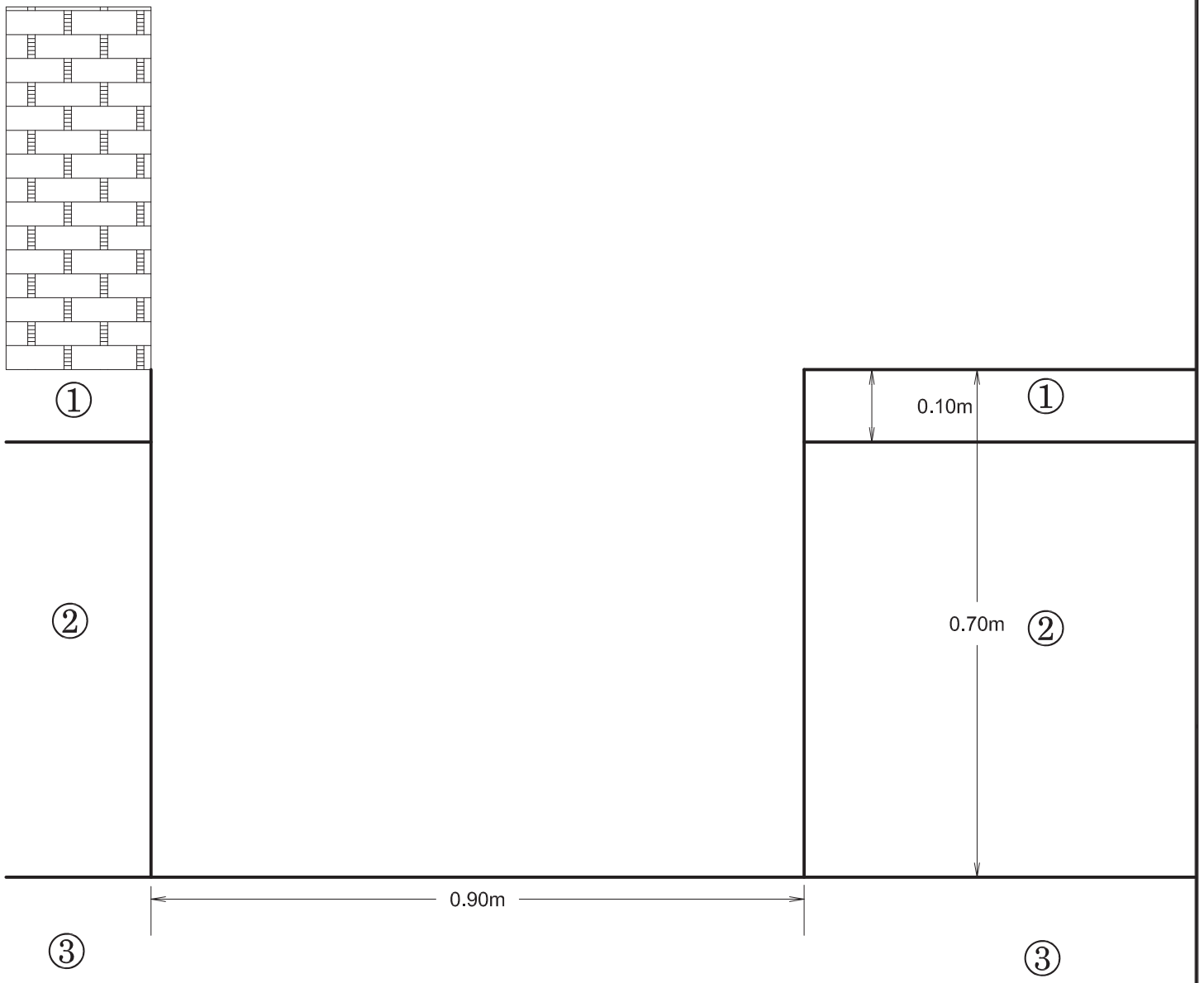
CLIENT : Gwynedd Consultancy
Job No.: 15695

Pit No. : 2B
DATE: 12/06/2013

LOCATION: PORTH YR AUR CAERNARFON

COMMENTS: Backfilled using 16 gravel bags to fill up cavity

Sea Wall



	Depth From	To	Soil Group	Soil Description
①	G.L	0.10	FILL	Tarmac surfacing
②	0.10	0.70	FILL	Dark brown slightly clayey SAND. Gravel is fine to coarse angular to rounded and mixed lithologies. Large brick fragments and cobbles.
③	0.70	-	FILL	Grout

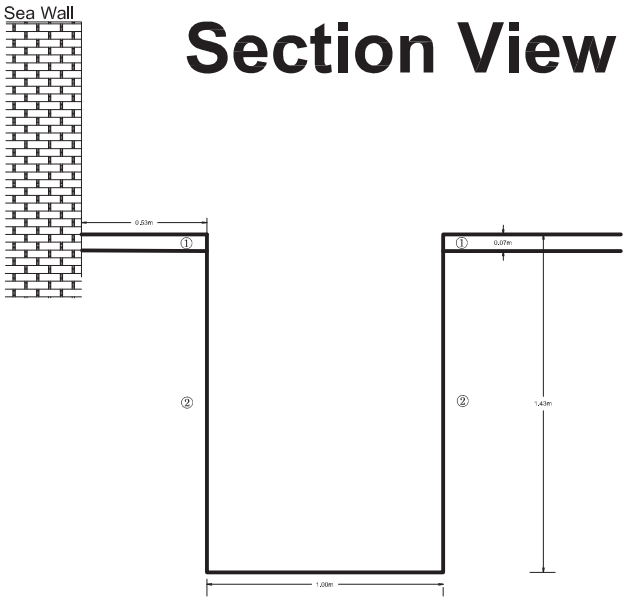
CLIENT : Gwynedd Consultancy
Job No.: 15695

Pit No. : 3
DATE: 13/06/2013

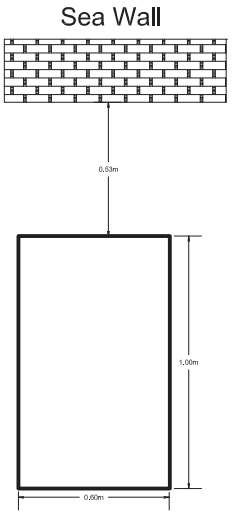
LOCATION: PORTH YR AUR CAERNARFON

COMMENTS: Client also logged photos and stopped pit at 1.43m

Section View



Plan View



	Depth From	To	Soil Group	Soil Description
①	G.L	0.07	FILL	Tarmac surfacing
②	0.07	1.43	FILL	MADE GROUND (Dark brown slightly clayey SAND. Gravel is fine to coarse angular to rounded and of mixed lithologies. Brick and mortar fragments of increasing size with increasing depth.)

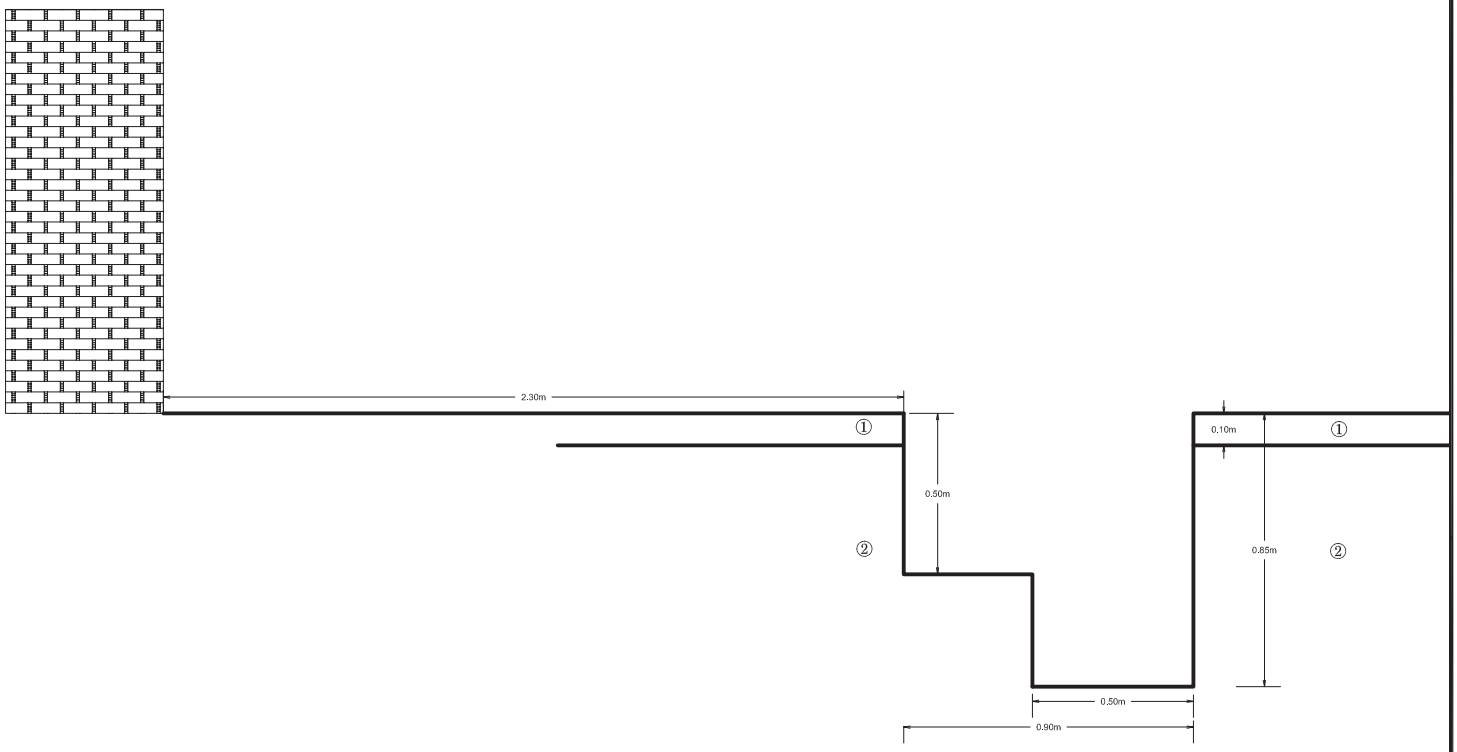
CLIENT : Gwynedd Consultancy
Job No.: 15695

Pit No. : 4
DATE: 13/06/2013

LOCATION: PORTH YR AUR CAERNARFON

COMMENTS: Pit stopped by client and archaeologist at 0.85m

Tower Wall



	Depth From	To	Soil Group	Soil Description
①	G.L	0.10	FILL	Tarmac surfacing
②	0.10	0.85	FILL	MADE GROUND (Dark brown slightly clayey SAND. Gravel is fine to coarse angular to rounded and mixed lithologies. Large cobbles and occasional mortar fragments.)

APPENDIX IV

Reproduction of Strata Surveys Limited Dynamic Probe Logs

STRATA SURVEYS LIMITED

Location **Porth Yr Aur, Caernarfon**

Client: Gwynedd Consultancy Project Ref.:

DRAFT

Borehole No. **BH03**

Job No.: **15695**

Equipment and methods **Continuous Dynamic Sampling**

Start Date: **12/06/2013**

Final Depth: **4.45m**

Drop Height
Drop Weight Mass
Cone Diameter
Casing Diameter **115mm**
Casing Depth **3.00m**

Blows	Penetration mm / blows	N100 - Blows per 100mm	In situ Tests Samples [N300] {Cu} Torque Nm	Description	Strata Depth & Thickness m	Strata Reduced Level (m)	Legend
8			D 1 0.20	MADE GROUND (MACADAM-Drillers description)	(0.10)		
6			B 1 0.30		0.10		
4				MADE GROUND (Black fine-coarse gravelly SAND. Gravel is angular to sub-rounded sandstone mixed lithologies with macadam)			
3			D 2 0.50		(0.90)		
5							
3							
3							
4							
1							
0	200		N (22) S 1 1.00		1.00	1.00	
1			D 3 1.00	Light grey mottled brown fine-coarse angular to sub-angular SAND and GRAVEL with cobbles including schist	(0.21)		
1					1.21		
2				Nil Recovery			
3					(0.79)		
3							
3							
2							
2							
2							
3			N (7) S 2 2.00		2.00	2.00	
7				Black slightly clayey fine-coarse SAND and GRAVEL. Gravel is angular to sub-angular sandstone and shale	(0.25)		
5					2.25		
1				Brown clayey slightly gravelly fine-coarse SAND. Gravel is angular to sub-angular	(0.16)		
2					2.41		
2				Nil Recovery			
2					(0.59)		
1							
2							
2							
2			N (6) S 3 3.00		3.00	3.00	
1				Brown/black gravelly fine-coarse sandy CLAY. Gravel is angular to sub-angular sandstone pebble			
2							
2							
2					(1.00)		
3							
3							
4							
7							
3							
7			N (102 S 4 4.00		4.00	4.00	
				Dense brown very clayey fine to coarse SAND and fine to coarse sub-angular GRAVEL.	(0.30)		
					4.30		
				Possible bedrock: Nil Recovery	(0.15)		
					4.45		
						5.00	
						6.00	
						7.00	
						8.00	

Continuous Dynamic Sounding Complete

Remarks
1) CAT scan and services inspection pit to 1m
2) Sampling complete at 4.45m
3) Continuous Sounding complete at 4m

Logged by **GL**
Drilled by **RC**
Ground level
Co-ordinates:

CDSa-Continuous Dynamic Sampling (84mm diameter 1.0m long). DPSH-Dynamic Probe Super Heavy (BS1377 Part 9 Test 3.2)

STRATA SURVEYS LIMITED

Location **Porth Yr Aur, Caernarfon**

Client: Gwynedd Consultancy Project Ref.:

DRAFT

Borehole No. **BH04**

Job No.: **15695**

Equipment and methods **Continuous Dynamic Sampling**

Start Date: **12/06/2013**

Final Depth: **4.45m**

Drop Height
Drop Weight Mass
Cone Diameter
Casing Diameter **115mm**
Casing Depth **4.45m**

Blows	Penetration mm / blows	N100 - Blows per 100mm	In situ Tests Samples [N300] {Cu} Torque Nm	Description	Strata Depth & Thickness m	Strata Reduced Level (m)	Legend
8			D 1 0.20	MADE GROUND (MACADAM-Drillers description)	(0.10)		
6			B 1 0.30		0.10		
2				Brown clayey fine-coarse SAND and fine-coarse angular to sub-rounded GRAVEL with cobbles consisting of mixed lithologies	(0.70)		
3			D 2 0.50				
3					0.80		
1							
1							
1							
3				MADE GROUND (Brown gravelly slightly clayey fine-coarse SAND. Gravel is angular to sub-angular sandstone cobble with occasional chalk)			
2			N (7) S 1 1.00			1.00	
1			D 3 1.00		(0.63)		
1	200						
0					1.43		
1				MADE GROUND (Weathered brown/grey mudstone/over full brick)	(0.23)		
1					1.66		
1				Soft brown slightly gravelly CLAY	(0.08)		
2				Nil Recovery	1.74		
1					(0.26)		
3			N (2) S 2 2.00		2.00	2.00	
1				Firm dark brown slightly gravelly slightly sandy fine-coarse CLAY. Gravel is angular to sub-rounded sandstone.			
1					(0.68)		
1							
2							
1	200				2.68		
0				Nil Recovery	(0.32)		
1	400						
0					3.00	3.00	
0							
0			N (2) S 3 3.00				
1	300			Loose orange/brown gravelly slightly clayey fine-coarse SAND. Gravel is angular to sub-angular sandstone and mixed lithologies.	(0.40)		
0					3.40		
0				Firm black slightly silty slightly gravelly CLAY. Gravel is angular to sub-angular	(0.25)		
1					3.65		
5				Black silty fine-coarse SAND and GRAVEL. Gravel is angular to sub-angular sandstone and mixed lithologies	(0.10)		
2					3.75		
1							
2							
5						4.00	
7			N (45) S 4 4.00				
				Dense dark grey fine to carse SAND and fine to coarse angular to sub-angular GRAVEL with mixed lithologies	(0.70)		
					4.45		
		Continuous Dynamic Sounding Complete				5.00	
						6.00	
						7.00	
						8.00	

Remarks
1) CAT Scan and services inspection pit to 1m
2) Borehole Complete at 4.45
3) Continuous Sounding complete 4m

Logged by **GL**
Drilled by **RC**
Ground level
Co-ordinates:

CDSa-Continuous Dynamic Sampling (84mm diameter 1.0m long). DPSH-Dynamic Probe Super Heavy (BS1377 Part 9 Test 3.2)

STRATA SURVEYS LIMITED

Location **Porth Yr Aur, Caernarfon**

Client: Gwynedd Consultancy Project Ref.:

Borehole No. DRAFT **DP1**

Job No.: **15695**

Equipment and methods **Continuous Dynamic Sounding**

Start Date: **11/06/2013** Final Depth: **4.00m**

Drop Height	750mm
Drop Weight Mass	64kg
Cone Diameter	50mm
Casing Diameter	
Casing Depth	

Blows	Penetration mm / blows	N100 - Blows per 100mm	In situ Tests Samples [N300] {Cu} Torque Nm	Description	Strata Depth & Thickness m	Reduced Level (m)	Legend
6							
4							
2							
1	200						
0							
2							
3							
2							
3							
3						1.00	
4							
5							
6							
1							
1							
1							
1	200						
0							
1							
4						2.00	
1							
3							
14							
3							
1							
0	200						
2							
2							
10							
6	100		T=10Nm			3.00	
		Continuous Dynamic Sounding Complete				4.00	
						5.00	
						6.00	
						7.00	
						8.00	

Remarks 1) Sounding Complete at 4m

Logged by Drilled by

Ground level

Co-ordinates:

CDSa-Continuous Dynamic Sampling (84mm diameter 1.0m long). DPSH-Dynamic Probe Super Heavy (BS1377 Part 9 Test 3.2)

STRATA SURVEYS LIMITED

Location **Porth Yr Aur, Caernarfon**

Client: Gwynedd Consultancy

Project Ref.:

Borehole No. **DP2**

DRAFT

Job No.: **15695**

Equipment and methods **Continuous Dynamic Sounding**

Start Date: **11/06/2013**

Final Depth: **4.00m**

Drop Height	750mm
Drop Weight Mass	64kg
Cone Diameter	50mm
Casing Diameter	
Casing Depth	

Blows	Penetration mm / blows	N100 - Blows per 100mm	In situ Tests Samples [N300] {Cu} Torque Nm	Description	Strata Depth & Thickness m	Strata Reduced Level (m)	Strata Legend
11							
7							
6							
2							
1							
2							
4							
2							
2							
3			T=10Nm			1.00	
2							
5							
3							
2							
2							
3							
2							
2							
2							
3			T=5Nm			2.00	
2							
3							
3							
2							
2							
2							
1							
5							
5							
7			T=5Nm			3.00	
2							
3							
3							
2							
2							
2							
1							
5							
5							
7			T=5Nm			4.00	
		Continuous Dynamic Sounding Complete					
						5.00	
						6.00	
						7.00	
7							
14							
17							
21							
15							
19							
19							
18							
14							
15	**100**					8.00	

Remarks 1) Sounding Complete at 4m

Logged by Drilled by

Ground level

Co-ordinates:

CDSa-Continuous Dynamic Sampling (84mm diameter 1.0m long). DPSH-Dynamic Probe Super Heavy (BS1377 Part 9 Test 3.2)

STRATA SURVEYS LIMITED

Location **Porth Yr Aur, Caernarfon**

Client: Gwynedd Consultancy

Project Ref.:

Borehole No. **DP3**

DRAFT

Job No.: **15695**

Equipment and methods **Continuous Dynamic Sounding**

Start Date: **11/06/2013**

Final Depth: **3.11m**

Drop Height	750mm
Drop Weight Mass	64kg
Cone Diameter	50mm
Casing Diameter	
Casing Depth	

Blows	Penetration mm / blows	N100 - Blows per 100mm	In situ Tests Samples [N300] {Cu} Torque Nm	Description	Strata Depth & Thickness m	Strata Reduced Level (m)	Strata Legend
5							
5							
4							
1	600						
0							
0							
0							
0							
0							
1						1.00	
1							
0	200						
2							
1							
2	300						
0							
0							
3							
2							
4						2.00	
1							
1	200						
0							
1	200						
0							
1	200						
0							
1	200						
0							
1						3.00	
2							
50	10	**Continuous Dynamic Sounding Complete**					
						4.00	
						5.00	
						6.00	
						7.00	
						8.00	

Remarks 1) Sampling Complete at 3.01m

Logged by Drilled by

Ground level

Co-ordinates:

CDSa-Continuous Dynamic Sampling (84mm diameter 1.0m long). DPSH-Dynamic Probe Super Heavy (BS1377 Part 9 Test 3.2)

STRATA SURVEYS LIMITED

Location **Porth Yr Aur, Caernarfon**

Client: Gwynedd Consultancy

Project Ref.:

DRAFT

Borehole No. **DP4**

Job No.: **15695**

Equipment and methods **Continuous Dynamic Sounding**

Start Date: **12/06/2013**

Final Depth: **4.00m**

Drop Height	750mm
Drop Weight Mass	64kg
Cone Diameter	50mm
Casing Diameter	
Casing Depth	

Blows	Penetration mm / blows	N100 - Blows per 100mm	In situ Tests Samples [N300] {Cu} Torque Nm	Description	Strata Depth & Thickness m	Strata Reduced Level (m)	Strata Legend
5							
4							
2							
3							
3	200						
0							
1							
4							
2							
2						1.00	
1							
2							
2							
1							
1	200						
0							
1							
1							
2							
6						2.00	
7							
16							
24							
8							
2							
1							
1							
2							
1							
1						3.00	
6							
3							
1	500						
0							
0							
0							
0							
1							
1							
1	100					4.00	

Continuous Dynamic Sounding Complete

5.00

6.00

7.00

8.00

Remarks 1) Sounding Complete at 4m

Logged by Drilled by

Ground level

Co-ordinates:

CDSa-Continuous Dynamic Sampling (84mm diameter 1.0m long). DPSH-Dynamic Probe Super Heavy (BS1377 Part 9 Test 3.2)

STRATA SURVEYS LIMITED

Location **Porth Yr Aur, Caernarfon**

Client: Gwynedd Consultancy Project Ref.:

Borehole No. **DP5** DRAFT

Job No.: **15695**

Equipment and methods **Continuous Dynamic Sounding**

Start Date: **12/06/2013** Final Depth: **4.00m**

Drop Height	750mm
Drop Weight Mass	64kg
Cone Diameter	50mm
Casing Diameter	
Casing Depth	

Blows	Penetration mm / blows	N100 - Blows per 100mm	In situ Tests Samples [N300] {Cu} Torque Nm	Description	Strata Depth & Thickness m	Reduced Level (m)	Legend
6							
4							
2							
1	200						
0							
1	300						
0							
0							
1	200						
0						1.00	
0		Sunk under own weight					
0							
0							
1							
1							
1							
1	400						
0							
0							
0						2.00	
3							
1	200						
0							
1	200						
0							
1							
1							
1							
4							
1						3.00	
13							
4							
5							
36							
39							
4							
2							
2							
1							
2						4.00	
		Continuous Dynamic Sounding Complete					
						5.00	
						6.00	
						7.00	
						8.00	

Remarks 1) Sounding Complete at 4m

Logged by Drilled by

Ground level

Co-ordinates:

CDSa-Continuous Dynamic Sampling (84mm diameter 1.0m long). DPSH-Dynamic Probe Super Heavy (BS1377 Part 9 Test 3.2)

Gwynedd Archaeological Trust
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