Beaumaris Flood Alleviation Scheme: Area 2

Archaeological Evaluation

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

Beaumaris Flood Alleviation Scheme: Area 2

Archaeological Evaluation

Prosiect Rhif / Project No. G2347

Adroddiad Rhif / Report No.1276

Prepared for: Coastal Engineering

November 2015

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Cyhoeddwyd gan Ymddiriedolaeth Achaeolegol Gwynedd
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NON-TECHNICAL SUMMARY

Gwynedd Archaeological Trust completed an archaeological evaluation trench in October 2015 across the proposed location of a flood alleviation culvert. The culvert forms part of the Beaumaris flood alleviation scheme proposals and comprises a 385.0m long and 1050mm diameter water relief culvert located to the north, east and south of Beaumaris Castle, crossing a pasture field, a playground area and an open parking space, before reaching the coastline. The evaluation trench was positioned to investigate the impact of the proposals on the castle moat, specifically where it is no longer visible above the ground.

The moat infill had previously been identified during groundworks in 2010 for the existing 750mm wide culvert, 3.10m west of the proposed culvert, as well as in a study of auger samples completed by the University of Louisiana in 2003, 29.0m north of the current evaluation. The 2010 groundworks did not identify the moat edge, but the edge was suggested as being 16.0m or less from the east curtain wall in the 2003 study. That study analysed the preserved microscopic, aquatic crustaceans (ostracods) within the moat infill as environmental indicators and concluded that the bottom moat infill represented the initial wet moat, the middle portion the connection with nearby seawater, and the top layers the loss of the connection with the nearby Menai Strait.

The Gwynedd Archaeological Trust evaluation trench identified the moat and associated fills at 1.1m below the existing ground level, with moat edge located 20.0m from the curtain wall of the castle. The base of the moat was not identified within the limit of excavation as it exceeded the safe excavation depth of 2.0m. Within the limit of excavation seven deposits were identified in the moat representing natural silting. The infills were subsequently sealed by a 0.90m thick subsoil deposit that in turn was sealed by the topsoil.

It was not possible within the scope of the initial evaluation trenching to identify the environmental factors behind the infilling of the moat, but a palaeoenvironmental sampling programme was completed for the Gwynedd Archaeological Trust by the Environmental Archaeology Consultancy. The sampling programme was completed using augering and core samples, with a view to completing a diagrammatic section of the lower moat fills and the basal profile, along with an interpretive consideration of the sediment based upon the field observations and the logs for each borehole. The sampling programme confirmed that the moat had an essentially flat basal profile, between 2.34 and 2.46m below ground level and that the moat would have been tidal if connected to the sea.

1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) was commissioned by Coastal Engineering UK Ltd to undertake an archaeological evaluation (trial trenching) in advance of proposed culverting works associated with the flood alleviation scheme at Beaumaris, Ynys Môn (NGR SH60787622).

The proposed culvert is located on client drawing CES316/05 Rev C (Castle Meadow Culvert Drainage Plan - Figure 01). The trial trenching approach was agreed in a meeting held on the 12th June 2015 between Cadw, Gwynedd Archaeological Planning Services, Gwynedd Consultancy and GAT. The aim of the evaluation was to inform the planning decision for the proposed culvert.

The designated areas within the flood alleviation scheme are located within a culturally sensitive area due to the wealth of heritage receptors within and around the town which is dominated by Beaumaris Castle. The Castle represents the pinnacle of late 13th century defensive engineering and as such is a Scheduled Ancient Monument (AN001), Grade I Listed Building and forms part of *The Castles and Town Walls of Edward I in Gwynedd* World Heritage Site. The town also lies within the boundary of the Isle of Anglesey Area of Outstanding Natural Beauty (AONB) and the Penmon Landscape of Outstanding Historical Interest (Ref: Penmon HLW (GW) 15 33).

The evaluation trench was located across the route of the proposed culvert to investigate the former moat (now infilled) on the east side of Beaumaris Castle, with the aim to identify the former moat location, profile and infill deposits, as well as any other archaeological activity that may be present. The evaluation areas are currently a public playground and a putting green.

Beaumaris has experienced flooding, both pluvial (from rain runoff) and coastal flooding in recent years, which was most recently recognised in December 2012 when coastal flooding, caused by a high spring tide plus a small surge combined with easterly winds caused overtopping of the whole of the Beaumaris coastal frontage between the Green and Gallows Point, causing flooding of the A545 coastal road into Beaumaris from Menai Bridge and the Green.

The Beaumaris Flood Alleviation Scheme consists of a suite of measures which act to reduce pluvial and coastal flooding in the town. Some measures are currently being implemented in the town, which include raising the height of the existing sea defences along the A545 between Gallows Point and the slipway east of Townsend Bridge.

The proposals for the evaluation area include a new surface water culvert to be installed in the field to the east of Beaumaris Castle (Castle Meadows). The new culvert (1050mm diameter) will connect to an existing 750mm culvert, which picks up town drainage, in the cattle drinking area, a natural dip in the field (Figure 01: the new culvert route represented in red, the existing culvert in blue). The new, larger culvert will run parallel to the existing flood relief culvert, buried to a depth of approximately 2.0m. The culvert will follow the edge of the castle moat and then turn south, where it crosses through a hedgeline, running to the west of the bowling green and to the east side of a miniature golf course. The culvert would then cross under the A545 where it would run across the green and outfall into the Menai Strait. In addition, a new section of culvert will be laid to join the existing 900mm and 750mm culvert to the cattle drinking area, which will have a new intake structure to capture flood water in the field.

The current evaluation report forms part of a larger works programme for the flood alleviation scheme. The report has been prepared as an interim report and is awaiting additional information further to palaeoenvironmental assessment of eight auger boreholes and two cores from within the moat and also a representative sample of the primary fill of the moat. The results of these samples and any additional supporting information will be reported in a revised version of this report.

Archaeological works within the remaining flood alleviation areas, as identified in GAT Assessment Report 1149, will be discussed in separate project reports.

The scheme is being monitored by Cadw and the Gwynedd Archaeological Planning Services (GAPS). Whilst the evaluation trench is not located within the Scheduled Ancient Monument (SAM) zone (Figure 01), Cadw is part of the monitoring process due to the proximity of the trench to the castle and the SAM. The content of this report must be approved by Cadw and GAPS prior to the start of works.

A project design was prepared for the works by GAT prepared a project design detailing the scope of works (08/07/15; cf. Appendix I) that was subsequently approved by Cadw and GAPS (13th July 2015). Reference was also made to the guidelines specified in the Chartered Institute for Archaeologists *Standard and Guidance for Archaeological Evaluation* (Chartered Institute for Archaeologists, 2014).

2 ARCHAEOLOGICAL BACKGROUND

To date, GAT has prepared an archaeological assessment of the flood alleviation areas (GAT Report 1149) that was submitted to support planning application 12C444B/FR, and subsequently a Historic Impact Assessment (HIA) that was prepared to assess the impact of the scheme on heritage receptors in the area (GAT Report 1200).

Prior to the current programme of works, the groundworks for the existing 750mm culvert (Figure 01) were monitored by the Gwynedd Archaeological Trust (GAT Report 869, September 2010). The archaeological mitigation was completed as a watching brief that monitored the entire culvert length (760.0m); this included monitoring the excavation of the easement corridor and the pipe trench. As indicated in Figure 01, the existing culvert route ran from the north of the castle and then along the eastern side of the castle, continuing south into the Green. The watching brief identified a culverted stream to the north of the castle and that the Green had been levelled and largely infilled in the 19th century. Along the east side of the castle it was assumed ahead of works that the culvert route would run close to or along the line of the former castle moat (which was no longer extant on this side). The watching brief did not identify the moat edge but did identify infill, suggesting the culvert trench was located within the moat. No natural soils were identified within the depth of the trench, which revealed varying clay and silt deposits, those lower down being blue in colour. The moat was extant on this side in Speed's map of 1610, but not on 18th century maps or images, suggesting it was filled in during this period. In the early 19th century an archway was knocked through Gunners Walk, and a path built through it around the castle. The arch was infilled and the path removed when the west and north side of the moat (and castle dock) was excavated after the castle was taken into Guardianship in 1925. The moat was not excavated out to the full width of the original moat. On the east side the moat was not excavated out at all, and this area was used for pleasure gardens and subsequently the present playground. Animal bone was identified by GAT during the 2010 culvert watching brief from the upper levels of the moat, suggesting rubbish was dumped here during the silting up of the moat.

A study of ostracods recovered from the moat infill at Beaumaris Castle was published in *Archaeology in Wales 44,* in 2004, based on the results of a coring programme completed in 2003 by Professor Mervin Kontrovitz, of the University of Louisiana. Ostracods are microscopic, aquatic crustaceans with calcium carbonate shells that are commonly preserved in ancient sediment. They are found in the oceans, estuaries and in freshwater bodies along coasts and inland. Different genera and species of ostracods inhabit different environments and are therefore useful in interpreting ecological factors from archaeological

and older sediments. They are sensitive to substrate, temperature, turbidity, salinity, other dissolved materials, and water depth. The wet, or once wet, moats of some medieval castles were suitable habitats for ostracods and the moat at Beaumaris Castle was chosen as a suitable place for because the moat was commonly reported to have had a direct connection to the sea. There was a possibility of recognising in the sediment the levels of transition from freshwater to marine and then back to freshwater when the moat was finally cut off from the nearby source of saltwater. Coring completed in 1995 in the re-excavated wet portion of the moat west of the castle failed to reveal any sediments of medieval age (*ibid*.). The coring programme from 2003 targeted the infilled portion of the moat, on the eastern side of the castle, north of the location for the current evaluation trench. A total of three cores were taken: sites designated as X, Y, and Z on a single transect. The transect line originated at the eastern, outer curtain wall, 7.60m north of the easternmost (middle) tower on that wall, and ran perpendicular from the wall to the supposed outer margin of the moat, *c.*29.0m north of the Gwynedd Archaeological Trust evaluation . Core X was situated 2m away from the eastern wall on the transect line; Core Y was taken at distance of 9m from the wall, but displaced 3m south of the transect line so as to avoid playground equipment and tarmacadam pavement emplaced by the Beaumaris Town Council; Core Z was situated 16m from the eastern curtain wall of the castle. Core X yielded a total depth of 2.65m of sediment, the bottom of which was interpreted to have reached pre-moat material; the deepest material was very dark greyish brown and was composed of gravel, clay and silt. The top 0.75m apparently represents recent fill and the bottom 1.90m appear to have been aquatic sediments deposited in the then wet moat. Core Y yielded a vertical interval of only 1.65m of sediment; deeper coring was impeded by a large, rock-hard object in the sub-surface. Subsequent attempts were made to ascertain the outward limits of the solid object by probing with a thin metal rod, but this effort was abandoned beyond 2m in each cardinal direction from the core site. Of the 1.65m of sediment, apparently, only the bottom 0.45m represented aquatic deposition in the then wet moat, as revealed by the presence of ostracods, calcareous foraminifera, charophytes, and/or thecamoebians. At site Z, no sediment was recovered that could be interpreted as having been deposited in an aquatic environment. There was very little organic matter, no trace of microscopic aquatic life forms, and the sediment colours were unlike most of those from the supposed wet moat sediments. This suggested that the moat edge was located between Core Y and Core Z, i.e., between 9.0m and 16.0m from the curtain wall.

Analysis of the core samples confirmed the aquatic origins of the sediments from depths of 2.65 to 0.75m in Core X and from 1.65 to 1.20m in Core Y. The report concluded that the ostracod specimens indicate that the sediments at depths of 2.60 to 2.15m were deposited

in fresh to slightly brackish water, while those at depths from 2.15 to 1.45m represent higher salinities, up to 25 or 30 %. The interval from 1.45 to 0.75m in depth represents reduced or freshwater salinities, while the top 0.75m had no ostracods and is post-moat fill. Thus, the bottom sediment represents the initial wet moat, the middle portion the connection with nearby seawater, and the top 1.45 to 0.75 the loss of the connection with the nearby Menai Strait (ibid.).

3 METHODOLOGY

3.1 Archaeological Trial Trench

The evaluation trench was be completed by 2No GAT personnel was completed between the 6th and 10th October 2015. Plant machinery was provided by the existing groundwork contractor engaged for the flood alleviation scheme (*Amey*).

The trench measured 9.0m long and 4.4m wide and was located perpendicular to the existing culvert and across the proposed culvert route (Figure 01).

The trench was opened using an 8 tonne tracked 360° excavator fitted with a toothless 1.8m wide bucket that was excavated in controlled layers. The limit of excavation was defined in the project design as the archaeological horizon or the glacial horizon, whichever was encountered first (Appendix I). Due to safety measures, the trench was stopped at 2.0m below ground level before the base of the moat was identified. The excavated trench was cleaned by hand by GAT personnel.

A photographic record was maintained using a digital SLR camera set to maximum resolution in RAW format; to be converted to TIFF and JPEG formats for subsequent archiving. A complete table of metadata with details of each image, including descriptions and directions of shot was produced using Microsoft Access; a total of 19 images were taken (archive ref. G2347_001 to G2347_019; cf. Appendix V).

All archaeological features and deposits were recorded onto GAT pro-forma context sheets and a stratigraphic site matrix compiled; a total of 12 contexts were recorded (cf. Appendix II (Context) and Appendix V (Matrix)).

3.2 Palaeoenvironmental Analysis

As defined in Section 2.3 of the project design (Appendix I), the identification of the moat, associated infilling and a defined section, would create an opportunity to recover palaeoenvironmental information for assessment. *The Environmental Archaeology Consultancy* were contracted to recover palaeoenvironmental samples and attended site on the 16th October.

The palaeoenvironmental sampling was also used to ascertain the full depth of the moat and the basal profile owing as this was not identified within the limit of excavation.

An auger transect was completed using eight boreholes at 0.5m intervals will be undertaken along the 5.0m floor of the evaluation trench using a 20mm diameter, 1m long, gouge auger. The deposits were logged and augering was terminated when the base of the moat has identified in each borehole (if the hole was not obstructed). The results were used to construct a diagrammatic section of the basal fills of the moat to show the whole sequence of fills and basal profile of the moat within the evaluation trench. The top of each borehole was surveyed using a *Trimble GNSS/R6/5800* GPS operated by GAT to obtain accurate 3D coordinates for each sequence.

Two core samples were taken of the moat fills to recover a complete sequence of the lower fills. These were taken by hand from the exposed sections and trench steps by knocking in 110mm diameter plastic earth pipes of appropriate length to recover an intact core through each part of the fills. The end of each sample core was sealed with gaffer tape to ensure a relatively airtight seal that prevented loss of water and oxidation of the sampled deposits. These cores were taken for the analysis of pollen, foraminifera, diatoms, ostracods, plant and insect macrofossil remains and radiocarbon.

In addition a bulk soil sample was taken from the basal 0.2m of the moat silts beneath the section near the west end of the trench immediately to the east

The report by *The Environmental Archaeology Consultancy* is attached as Appendix VI and within the results section the palaeoenvironmental information will be compared to the results of the ostracods study from 2003, completed by the University of Louisiana (cf. para. 2.0).

4 RESULTS

For the purposes of this section, context numbers within square brackets (e.g. [004]) represented a cut feature, and context numbers within round brackets (e.g. (001)) represent layers, deposits and fills. For a complete list of contexts, cf. Appendix II.

4.1 Evaluation Trench

The topsoil (001) had a maximum depth of 0.25m and sealed a 0.9m thick subsoil (002), which had been cut by two small ceramic drains (Figure 07), of probable nineteenth century origin. The subsoil sealed the moat, which was identified as a cut feature at the eastern end of the trench. The base of the moat was not identified during the excavation of the trial trench as it was below the site limit of excavation (defined as 2.0m due to safety concerns), but was subsequently identified using core samples taken by a palaeoenvironmental specialist as between 2.34m and 2.46m below ground level.

The moat included seven distinct infills: Contexts (005) to (011) and a visible profile was 45 degrees. The infills had been partly truncated by a post-medieval ceramic drain and associated cut (Context 012; Figure 07). No artefacts were recovered from the moat infills; post-medieval pottery was recovered from the topsoil, but was not retained for further assessment.

The earliest identified moat infill was (008), which comprised very dark grey/black silt containing soft marine shells, possibly in brackish waters with a depth of at least 0.25m. The depth of this deposit was not identified due to the safety limit of excavation; the results of the auger survey will confirm whether this was the primary infill.

- Context (008) was sealed by a 0.20m a loose deposit of light brownish grey sand-silt (006) that included river gravels, and appeared to have silted from the eastern side of the moat.
- Context (006) was sealed by a 0.15m thick deposit of soft bluish grey sandy clay (007) with infrequent flecks of charcoal the eastern edge of the trench and also appeared to have silted from the eastern side of the moat.
- Context (007) was sealed by a 0.10m thick deposit (005) that comprised a fairly soft and elastic brown grey sandy clay containing occasional small stones seems, which had silted from the eastern side of the moat.
- Context (005) was sealed by a 0.20m thick soft mid bluish grey sandy clay (009), which had silted from the eastern side of the moat.

- Context (009) was sealed by a 0.12m thick infill (010) of soft mid brown grey silty clay containing occasional small sub-rectangular stones, which had silted from the eastern side of the moat.
- Context (010) was sealed by a 0.30m thick infill (011), which was a soft light bluish grey sandy clay containing occasional small sub-angular stone that had silted from the eastern side of the moat. Context (011) was the final infill deposit and was sealed by the subsoil (002).

4.2 Palaeoenvironmental Sampling

As part of the archaeological evaluation a programme of palaeoenvironmental sampling was completed to ascertain the full depth of the moat, the basal profile and to analyse the moat fills, with a view to identifying any potential for further assessment and to compare the information to the existing results from the Kontrowitz study.

The sampling was completed using an auger survey transect across the evaluation zone, a core sample of the moat fills and a bulk sample from the basal 20cm of the moat for potential macrofossil study.

A total of eight boreholes were completed for the auger survey. The deposits in boreholes BH1, BH2 and BH3 at the east end of the trench were all glacial till, the deposits that underlie and formed the floor of the moat. The maximum depth and basal profile of the moat was identified in boreholes BH5 to BH8 and the core sample and indicated a broadly flat moat floor at between 2.34 and 2.46m below ground level; the variations in level evident on the floor of the moat probably reflected the uneven surface produced by hand digging (Rackham, 2015: 02).

The core samples confirmed that the fills of the moat largely comprised fine grained slightly organic silts with some visible organic fragments and occasional small twigs and small roundwood. The deposits suggested episodes of sedimentation perhaps indicating periods of silt deposition from terrestrial (the stream valley to the north) and marine sources.

The bulk sample produced a range of debris including plant detritus, moss, seeds, insect fragments, shells and fish bone. The analysis of the macrofossils indicated a marine element included a bivalve common in saltmarsh channels and estuaries, foraminifera, cockle shell fragments, *Hydrobia ulvae* a species of estuaries and saltmarsh. Freshwater conditions were suggested by the presence of midge larval heads (Chironomidae).

The report concluded that the moat would have been tidal if connected to the sea: the marine elements in the bulk sample certainly suggest this and previous work on the ostracods (Kontrovitz and Henry 2004) proposed basal sediments (2.6-2.15m depth) of fresh to slightly brackish water followed by brackish or marine at 2.15 to 1.3m depth suggesting a connection with the Menai Strait, with the upper sediments reduced in salinity suggesting disconnection from the Strait. Given that the building of the castle was begun in the 1290's and digging of the moat was still underway in 1312-1315 AD there must have been a period (during its construction) when it was not connected to the sea but almost certainly periodically flooded (as a result of precipitation), which could in part account for a freshwater to slightly brackish element in the basal fills, although perhaps not as much as half a metre.

5 CONCLUSION

The Gwynedd Archaeological Trust evaluation trench was located across the route of the proposed culvert to investigate the former moat (now infilled) on the east side of Beaumaris Castle, with the aim to identify the former moat location, profile and infill deposits, as well as any other archaeological activity that may be present.

The evaluation concluded the following:

- The moat edge was located 20.0m from the curtain wall of Beaumaris Castle;
- The edge of the moat was identified 1.1m below ground level and was clearly defined with a slope of 45° to vertical, which levelled off after reaching a depth of 0.9m, with a slight downward gradient leading towards the centre of the moat;
- The basal profile was confirmed by auger survey to be essentially flat, with a depth of between 2.34m and 2.46m below ground level;
- A total of seven infill deposits were identified within the moat that were present between 1.1m and 2.0m below ground level. The composition of the deposits suggested natural silting. The infills were subsequently sealed by a 0.90m thick subsoil deposit that in turn was sealed by the topsoil;
- The infills were partly truncated by a drainage cut that included a ceramic drain, of probable nineteenth century origin; this drainage feature was sealed by the subsoil, suggesting the subsoil was of later origin and may have been a landscaping deposit. The subsoil in turn had been cut by further ceramic drain pipes.

No dateable artefacts nor animal bone were recovered from the moat infill. An auger transect across the evaluation area and a core sample of the moat fills were completed by *The Environmental Archaeology Consultancy* for the Gwynedd Archaeological Trust as part of the evaluation phase and revealed that the moat had an essentially flat bottom to its profile and that it had contained at various times both fresh water and sea water. It is likely that this section of moat was excavated between 1316 and 1321 (Baynes 1927: 53) following the construction of the castle outer curtain.

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Coastal Engineering UK Ltd *Beaumaris Flood Alleviation Works: Castle Meadow Proposed Culvert Longsections* Drawing **66/1310 CES316/05-2 A**

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RCAHMW Guidelines for Digital Archives Version I

Trench Location

Gwynedd Archaeological Trust

Figure X: Location of proposed trench, Castle Meadow, G2347

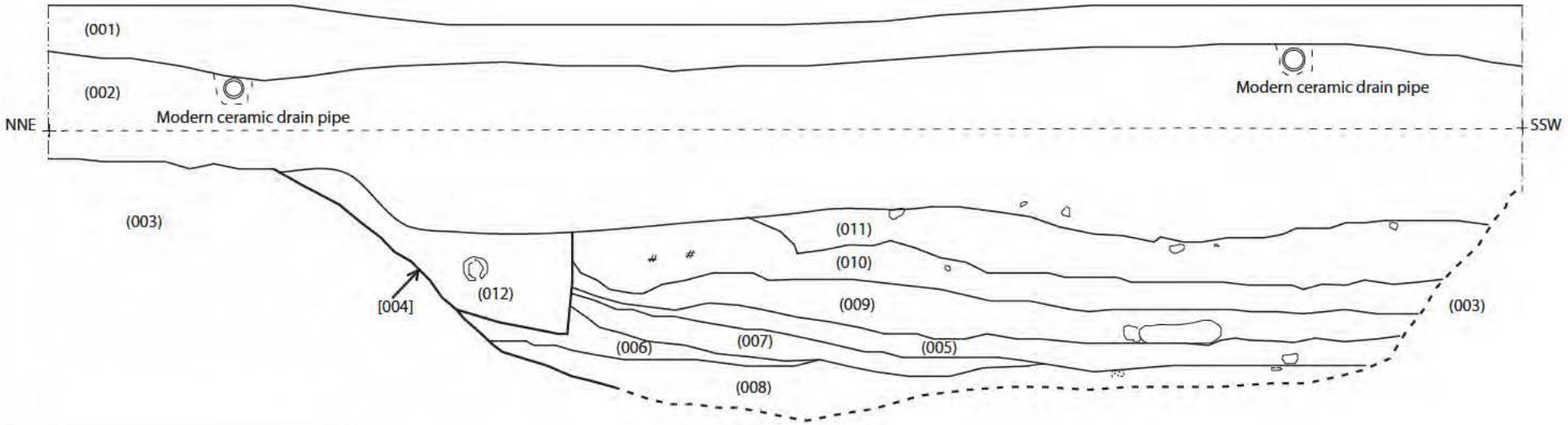
Existing culvert route
Proposed culvert route
Scheduled area

N

Trench corner co-ordinates:
1 E 260,793.46 / N 376,233.85
2 E 260,801.36 / N 376,235.15
3 E 260,801.68 / N 376,233.17
4 E 260,793.78 / N 376,231.87

Date: 22/06/2015
Author: NMC
Office:
Drawing: G2347/ TL1
Scale: 1:1250@A3

0 12.5 25 50
metres



Key:

Context (001) - Top soil
Context (002) - Sub Soil
Context (003) - Natural
Context (004) - Cut of moat
Context (005) - Clay sandy layer
Context (006) - Gravel and sandy layer
Context (007) - Dark grey silty layer
Context (008) - Black marine silt layer
Context (009) - Sandy silt layer
Context (010) - Grey silt layer
Context (011) - Light bluish clay layer
Context (012) - Modern drain pipe

#_# Charcoal flecks

Stones

Figure 2: Northwest facing section of Gwynedd Archaeological Trust evaluation trench

Plate 01: View of north facing section of evaluation trench. Scale 2 x 1m.

Plate 02: View of western end of north facing section of evaluation trench. Scale 2 x1m.

Plate 03: View of central portion of north facing section of evaluation trench. Scale 2 x 1m.

Plate 04: View of eastern end of north facing section of evaluation trench. Scale 1 x 1m.

Plate 05: View of evaluation trench from the west. Scale 1 x 1m.

Plate 06: View of evaluation trench from the east. Scale 2 x 1m.

Plate 07: View of auger samples being taken from the base of the moat.

Plate 08: View of core samples being taken from the western end of the evaluation trench.

APPENDIX I

Gwynedd Archaeological Trust Project Design for Archaeological Evaluation, July 2015.

BEAUMARIS FLOOD ALLEVIATION SCHEME (G2347)

PROJECT DESIGN FOR ARCHAEOLOGICAL EVALUATION:

Castle Meadow, Playground Area and Gunner`s Walk

Prepared for

Ymgynghoriaeth Gwynedd Consultancy

July 2015

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

Approvals Table				
	Role	**Printed Name**	**Signature**	**Date**
Originated by	Document Author	John Roberts		07/07/15
Reviewed by	Document Reviewer	John Roberts		07/07/15
Approved by	Principal Archaeologist	John Roberts		07/07/15

Revision History			
Rev No.	**Summary of Changes**	**Ref Section**	**Purpose of Issue**
1	Edit to introduction based on client's feedback; revised insurance details	Para. 1.0; Para. 6.0	reissue to client further to edit
2	Edit based on GAPS feedback	All	Reissue to GAPS for approval

-

BEAUMARIS FLOOD ALLEVIATION SCHEME

PROJECT DESIGN FOR ARCHAEOLOGICAL EVALUATION

Prepared for *YGC (Ymgynghoriaeth Gwynedd Consultancy)*, July 2015

CONTENTS

1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) has been commissioned by *Ymgynghoriaeth Gwynedd Consultancy* (YGC) to undertake an archaeological evaluation (trial trenching) in advance of proposed culverting works associated with the flood alleviation scheme at Beaumaris, Ynys Môn (NGR 260788 376228).

The proposed culvert is located on client drawing CES316/05 Rev C (Castle Meadow Culvert Drainage Plan - Figure 01). The trial trenching approach was agreed in a meeting held on the 12th June 2015 between Cadw, Gwynedd Archaeological Planning Services, YGC and GAT. The aim of the evaluation is to inform the planning decision for the proposed culvert.

The flood alleviation areas are located within a culturally sensitive area due to the wealth of heritage receptors within and around the town which is dominated by Beaumaris Castle. The Castle represents the pinnacle of late 13th century defensive engineering and as such is a Scheduled Ancient Monument (AN001), Grade I Listed Building and forms part of *The Castles and Town Walls of Edward I in Gwynedd* World Heritage Site. The town also lies within the boundary of the Isle of Anglesey Area of Outstanding Natural Beauty (AONB) and the Penmon Landscape of Outstanding Historical Interest (Ref: Penmon HLW (GW) 15 33).

The trial trench will be located across the route of the proposed culvert to investigate the former moat on the east side of Beaumaris Castle. This area has been landscaped and is presently used as a garden area, children`s playground and a putting green, and lies a few metres to the west of a bowling green. The evaluation will aim to identify the former moat location, profile and infill deposits, as well as any other archaeological activity that may be present.

Beaumaris has experienced flooding, both pluvial (from rain runoff) and coastal flooding in recent years, which was most recently recognised in December 2012 when coastal flooding, caused by a high spring tide plus a small surge combined with easterly winds caused overtopping of the whole of the Beaumaris coastal frontage between the Green and Gallows Point, causing flooding of the A545 coastal road into Beaumaris from Menai Bridge and the Green.

The Beaumaris Flood Alleviation Scheme consists of a suite of measures which act to reduce pluvial and coastal flooding in the town. Some measures are currently being

implemented in the town, which include raising the height of the existing sea defences along the A545 between Gallows Point and the slipway east of Townsend Bridge.

The proposals include a new surface water culvert to be installed in the field to the east of Beaumaris Castle (Castle Meadows). The new culvert (1050mm diameter) will connect to an existing 750mm culvert, which picks up town drainage, in the cattle drinking area, a natural dip in the field (Figure 01: the new culvert route represented in red, the existing culvert in blue). The new, larger culvert will run parallel to the existing flood relief culvert, buried to a depth of approximately 2m. The culvert will follow the edge of the castle moat and then turn south, where it crosses through a hedgeline, running to the west of the bowling green and to the east side of a miniature golf course. The culvert would then cross under the A545 where it would run across the green and outfall into the Menai Strait. In addition, a new section of culvert will be laid to join the existing 900mm and 750mm culvert to the cattle drinking area, which will have a new intake structure to capture flood water in the field.

To date, GAT has prepared an archaeological assessment of the flood alleviation areas (GAT Report 1149) that was submitted to support planning application 12C444B/FR, and subsequently a Historic Impact Assessment (HIA) that was prepared to assess the impact of the scheme on heritage receptors in the area (GAT Report 1200).

Prior to the current programme of works, the groundworks for the existing 750mm culvert (Figure 01) were monitored by the Gwynedd Archaeological Trust (GAT Report 869, September 2010). The archaeological mitigation was completed as a watching brief that monitored the entire culvert length (760.0m); this included monitoring the excavation of the easement corridor and the pipe trench. As indicated in Figure 01, the existing culvert route ran from the north of the castle and then along the eastern side of the castle, continuing south into the Green. The watching brief identified a culverted stream to the north of the castle and that the Green had been levelled and largely infilled in the 19th century. Along the east side of the castle it was assumed ahead of works that the culvert route would run close to or along the line of the former castle moat (which was no longer extant on this side). The watching brief did not identify the moat edge but did identify infill, suggesting the culvert trench was located within the moat. No natural soils were identified within the depth of the trench, which revealed varying clay and silt deposits, those lower down being blue in colour. The moat was extant on this side in Speed's map of 1610, but not on 18th century maps or images, suggesting it was filled in during this period. In the early 19th century an archway was knocked through Gunners Walk, and a path built through it around the castle. The arch was infilled and the path removed when the west and north side of the moat (and castle

dock) was excavated after the castle was taken into Guardianship in 1925. The moat was not excavated out to the full width of the original moat. On the east side the moat was not excavated out at all, and this area was used for pleasure gardens and subsequently the present playground. Animal bone was identified by GAT during the 2010 culvert watching brief from the upper levels of the moat, suggesting rubbish was dumped here during the silting up of the moat.

The current evaluation forms part of a larger works programme for the flood alleviation scheme. Further archaeological works within this area and the remaining flood alleviation areas, as identified in GAT Assessment Report 1149, will be discussed in separate project designs.

The scheme will be monitored by Cadw and the Gwynedd Archaeological Planning Services (GAPS). Whilst the evaluation trench is not located within the Scheduled Ancient Monument (SAM) zone (Figure 01), Cadw will need to be part of the monitoring process due to the proximity of the trench to the castle and the SAM and the possibility that schedulable archaeology may be encountered.

The content of this design must be approved by Cadw and GAPS prior to the start of works.

Reference will be made to the guidelines specified in the Chartered Institute for Archaeologists *Standard and Guidance for Archaeological Evaluation* (Chartered Institute for Archaeologists, 2014).

2 METHODOLOGY

2.1 Introduction

The evaluation trench will be completed by 2No GAT personnel. All plant, security and welfare will be provided by the existing groundwork contractor engaged for the flood alleviation works (*Amey*). The trench zone will be secured for the duration of the works and will remain under *Amey* CDM (Construction/Design/Management) regulations.

The work is currently scheduled for July 2015, with a minimum estimate of 2No days to excavate the trench. Additional time may be required to record encountered archaeological and palaeoenvironmental activity. The client, GAPS and Cadw will be informed of the initial results and expectant time duration to complete the evaluation.

The trench location is indicated on Figure 01. The trench will be located perpendicular to the existing culvert and will be positioned across the proposed culvert route. The existing culvert carries surface water runoff, not sewer or combined flows, and is owned and maintained by Ynys Mon Council; GAT is currently informed (YGC pers comm.) that there are no specific Dwr Cymru requirements for opening the trench against the existing culvert. The NGR co-ordinates for the trench are included on Figure 01; these coordinates will be inputted into a *Trimble GNSS/R6/5800* GPS by GAT to allow for accurate locating of the trench (<10cm accuracy) prior to excavation. The trench will be excavated by machine under GAT direction; this will include excavation of any moat infill encountered. The GAT team will be responsible for examining, cleaning and recording all exposed sections and archaeological features and artefacts encountered. Specific methodology for ecofacts is discussed below.

The proposed trench length is 10.0m and width is 2.0m. The limit of excavation as defined by GAT will be the archaeological horizon or the glacial horizon, whichever is encountered first. In this instance, the aim of the evaluation is to identify the impact of the proposed culvert route on the former moat and it is expected that the trench will encounter moat infill and the moat outline. The moat infill may include natural infilling and deliberate backfilling/landscaping. The excavation depth may require the use of safety measures to allow safe working by GAT; the scope of this will be dependent on the archaeology encountered and the CDM requirements enforced by *Amey,* and may include shoring and/or a wider stepped trench. It is also expected that water ingress will be encountered and appropriate measures will be taken to remove water if this impedes the evaluation process; this may include the use of water pumps, supplied by the site contractor. All requirements will

be incorporated into the GAT dynamic risk assessment protocols, including updated risk assessments and method statements (RAMS).

Note: Any variation to the size of the excavation area, including expansion of the trench to accommodate safe working, will need to be agreed in advance with client, GAPS and Cadw.

Note: if any potential nationally important remains are identified with the confines of the evaluation, fieldwork will cease to allow GAPS/Cadw to be notified and a suitable response defined. Nationally important remains may include the moat, associated activity and/or specific recovered artefacts.

The contractor (*Amey*) will be responsible for backfilling and re-instatement of the site on completion of the works by GAT.

Due to the location and nature of the works, it is expected that there will be public interest in the archaeological works. The GAT proposals for public engagement are:

1. On the ground informal public engagement from our site team during works, as it is very likely members of the public will walk up and ask about the works;
2. A formal information point at the site for the public to read – format and content to be agreed by all parties;
3. Liaison and information share with the head custodian at Beaumaris Castle, Mike Williams, so he can inform the public in the Castle; this would tie in with the public viewing the works from the Castle walls;
4. Using social media to promote the works – following all client requirements and agreed format.

2.2 Site Specific Methodology

The following methodology will be applied:

- The trench will be excavated by machine in controlled layers. Topsoil, subsoil and subsequent layers/deposits will be stored in separate bunds, based on site contractor requirements. The machine will use a toothless bucket for the duration of the evaluation.
- All archaeological features/deposits encountered will be manually cleaned and examined to determine extent, function, date and relationship to adjacent features/deposits. Sample excavation rates of archaeological features will be at least 25% for long linear features, 50% for post holes and pits and 100% for significant discrete features and burials. If the moat and associated fill are identified, then a minimum of 50% of the moat infill will be excavated in the first instance; this would equate to a 1.0m wide excavation of the infill. This will allow an initial evaluation of infill content and depth and an opportunity to determine the scope of any ecofact analysis. This will also assist with making an appropriate decision as to health and safety requirements for deep excavation. A decision can then be made as to whether this percentage should be increased to allow for the recovery of further information.
- The evaluation trench and any identified features and contexts will be recorded using GAT pro-formas and photographed using a digital SLR camera set to RAW format, with a resolution of 10.2 megapixels (camera model: Nikon D40X).
- A complete table of metadata with details of each image, including descriptions and directions of shot will be produced using Microsoft Access.
- Images will be converted to TIFF and JPEG format for archiving
- The extent of any identified archaeological activity and any features therein will be located using survey grade (not handheld) GPS with <10cm accuracy (model: *Trimble GNSS/R6/5800*). Appropriate photographic scales will be used where possible.
- A drawn record will be completed for all relevant features and/or exposed sections. This will include sections and plans where required at either 1:10, 1:20 or 1:50 scale. All recording will be completed in accordance with site health and safety requirements applied by *Amey*.
- Adobe Photoshop CS5 will be used for any post processing work required.

2.3 Environmental Samples

The sampling strategy will be undertaken in accordance with the principles set out in Environmental Archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation (English Heritage, 2011).

Relevant archaeological deposits will be sampled by taking bulk samples, comprising a minimum of 10.0 litres per context, or 100% of smaller contexts, for flotation of charred plant remains.

Waterlogged archaeological deposits will be sampled by taking bulk samples, comprising a minimum of 10.0 litres per context, or 100% of smaller contexts, for the recovery of macroscopic plant remains.

Samples will be processed on completion of the fieldwork programme and in line with a further archaeological works strategy agreed with Cadw, GAPS and YGC and as part of a MAP2 compliant post-excavation programme. The samples will be processed by the GAT nominated palaeoenvironmental specialists.

If the moat infill is identified and a suitable section is exposed, then recourse may also be made to take a monolith sample of the section. This may create a opportunity to recover palynological samples from infill. This will be considered as further archaeological works and will involve contact with an appropriate palaeoenvironmental specialist as to an appropriate methodology, and the submission of a further works design detailing the approach, for approval by all parties. The nominated specialist is listed in para. 2.8.

2.4 Small Finds

The vast majority of finds recovered from archaeological excavations comprise pottery fragments, bone, environmental and charcoal samples, and non-valuable metal items such as nails. Often many of these finds become unstable (i.e. they begin to disintegrate) when removed from the ground. All finds are the property of the landowner; however, it is Trust policy to recommend that all finds are donated to an appropriate museum where they can receive specialist treatment and study. Access to finds must be granted to the Trust for a reasonable period to allow for analysis and for study and publication as necessary. All finds would be treated according to advice provided within *First Aid for Finds* (Rescue 1999). Trust staff will undertake initial identification, but any additional advice would be sought from a wide range of consultants used by the Trust, including National Museums and Galleries of Wales at Cardiff. Any subsequent analysis and assessment of recovered artefacts will be discussed in an appropriate further works design incorporated into the MAP2 post-excavation process.

Note: the landowner is Ynys Mon Council. GAT will contact the landowner for agreement regarding the transfer of artefacts, initially to GAT and subsequently to the relevant museum (Oriel Ynys Mon). A GAT produced pro-forma will be issued to the landowner where they are given the option to donate the finds or to record that they want them returning to them once analysis and assessment has been completed. If artefacts are transferred to Oriel Ynys Mon, this must be in accordance with the Oriel Ynys Mon – Guidelines for the preparation and deposition of archaeological archive (2012; cf. Appendix B).

2.4.1 Unexpected Discoveries: Treasure Trove

Treasure Trove law has been amended by the Treasure Act 1996 and 2002. The following are Treasure under the Act:

- *Objects other than coins* any object other than a coin provided that it contains at least 10% gold or silver and is at least 300 years old when found.
- *Coins* all coins from the same find provided they are at least 300 years old when found (if the coins contain less than 10% gold or silver there must be at least 10. Any object or coin is part of the same find as another object or coin, if it is found in the same place as, or had previously been left together with, the other object. Finds may have become scattered since they were originally deposited in the ground. Single coin finds of gold or silver are not classed as treasure under the 1996 Treasure Act.
- *Associated objects* any object whatever it is made of, that is found in the same place as, or that had previously been together with, another object that is treasure.
- *Objects that would have been treasure trove* any object that would previously have been treasure trove, but does not fall within the specific categories given above. These objects have to be made substantially of gold or silver, they have to be buried with the intention of recovery and their owner or his heirs cannot be traced.

The following types of finds are not treasure:

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

All finds of treasure must be reported to the coroner for the district within fourteen days of discovery or identification of the items. Items declared Treasure Trove become the property of the Crown, on whose behalf the National Museums and Galleries of Wales acts as advisor on technical matters, and may be the recipient body for the objects.
The National Museums and Galleries of Wales will decide whether they or any other museum may wish to acquire the object. If no museum wishes to acquire the object, then the Secretary of State will be able to disclaim it. When this happens, the coroner will notify the occupier and landowner that he intends to return the object to the finder after 28 days unless he receives no objection. If the coroner receives an objection, the find will be retained until the dispute has been settled.

2.6 Human Remains

Any human remains will be left *in-situ*, covered and protected, and both the coroner and GAPS, Cadw, the client (YGC) and landowner (Ynys Mon Council) 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 from the *Ministry of Justice* under Section *25* of the Burials Act 1857 for the removal of any body or remains of any body from any place of burial. If required, an osteologist will be to provide advice on the excavation, recording and sampling strategy to be employed during the exhumation of burials, particularly with regards to the collection of special samples for scientific analysis, including stable isotope and any other relevant techniques. Any strategy employed will be defined in an appropriate Further Archaeological Works Design and incorporated into the MAP2 compliant post-excavation programme.

2.6 Further Archaeological Works

Further archaeological works includes additional time and resourcing on site to investigate and process extensive archaeological activity not within the scope of the current project design and not covered within the methodology defined in para. 2.2. Further archaeological works may necessitate the production of a new project design and the submission of new cost estimates to the client during fieldwork and as part of the MAP2 compliant post-excavation process.

The application of a further archaeological works design (FAWD) will be dependent on the establishment of a threshold of significance over which a FAWD might be triggered. The requirement for an FAWD will be determined in conjunction with GAPS and Cadw through established communication lines and the monitoring process.

The recovery of artefacts and bulk sample ecofacts are covered within the current design. The post-excavation analysis and assessment of recovered artefacts and ecofacts and the use of appropriate specialists will be included within the further archaeological works process, in line with phases 4 and 5 of MAP2 (English Heritage, 1991, *Management of Archaeological Projects*). Specialist advice may be sought during the evaluation process, in advance of an FAWD, to determine an appropriate method for recovering arefacts and ecofacts.

The FAWD will be instigated through GAT produced documents that will include:

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

2.7 Monitoring Arrangements

GAPS and Cadw will need to be informed of the project start date and of the subsequent progress and findings. This will allow the GAPS and Cadw time to arrange monitoring visits and attend site meetings (if required) and enable discussion about the need or otherwise for FAWDs (if required) as features of potential archaeological significance are encountered. The archaeological evaluation will commence in July 2015. If this is subject to change then GAPS and Cadw will be notified.

2.8 Nominated Specialists

The nominated specialists who will be contacted for artefact and ecofact advice and services are:

- Metalwork and slag: Dr Tim Young, Cardiff University
- Conservation: Phil Parkes, Cardiff Conservation Services
- Pottery: Julie Edwards (Chester Archaeology)
- Animal Bone: Dr. James Rackham (Environmental Archaeology Consultancy)
- Palaeoenvironmental: Dr. James Rackham (Environmental Archaeology Consultancy)

2.9 Data processing and report compilation

The results of the evaluation will be included in a GAT produced report. An initial report will be submitted to all parties within four weeks of fieldwork completion. This will either be a draft final report or a MAP2 compliant interim report, should there be a requirement for specialist analysis and assessment of recovered artefacts and/or ecofacts.

Immediately upon completion of the finalised report, the report and any data or other documentation produced shall be integrated into the site archive, following all procedures defined in the GAT internal document on archiving (reproduced as Appendix C)

Archiving shall be undertaken in accordance with the requirements of *Standards and Guidance for Archaeological Evaluation* (CIfA 2014) and *Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials* (CIfA 2014). The submission of archive information to the Historic Environment Record, the Royal Commission on the Ancient and Historical Monuments of Wales and Oriel Ynys Mon, will be in accordance with their standards, as defined in para. 3.

The final report will include photographs of the evaluated area. Illustrations will include location plans for the evaluation trench, section drawings and any individual features which may be found. Historical maps, when appropriate and if copyright permissions allow, will be included. Note: if archaeological activity is identified, then a Primary Reference Number will be required for inclusion in all reporting. The Primary Reference Number is a unique identifier prepared by and used by the Historic Environment Record. GAT is responsible for sourcing Primary Reference Numbers from the Historic Environment Record.

The report will include the following sections as a minimum:

- Summary
- Introduction
- Aims and purpose
- Specification
- Methods and techniques, including details and location of project archive.
- Evaluation results
- Summary and conclusions
- List of sources consulted.

3 DISSEMINATION AND ARCHIVING

The following dissemination procedures will be applied on completion of the project:

- one hard copy and one digital copy to the client;

- one hard copy and one digital copy each for GAPS and Cadw;

- one hard copy and one digital copy will be sent to the Historic Environment Record Archaeologist for the area (HER, Gwynedd Archaeological Trust, Craig Beuno, Bangor, Gwynedd LL57 2RT);

- Submission of digital information to the Historic Environment Record, located at the Gwynedd Archaeological Trust will be based on the DRAFT Standard and Guidelines for Spatial Data (Gwynedd Archaeological Trust 2014a) and DRAFT Historic Environment Record Guidelines for Archaeological Contractors (Gwynedd Archaeological Trust 2014b). This will include the approved report(s) and digital support data, including GIS (MapInfo format). In line with the regional Historic Environment Record (HER) requirements, the HER must be contacted at the onset of the project to ensure that any data arising is formatted in a manner suitable for accession to the HER. At the onset, the HER Enquiry Form provided by the HER, will be completed and submitted.

- Submission of digital information to the Royal Commission on the Ancient and Historical Monuments of Wales shall be undertaken in accordance with the RCAHMW Guidelines for Digital Archives Version 1 (2015; cf. Appendix A). Digital information will include the photographic archive and associated metadata.

- Submission of paper and material archive to Oriel Ynys Mon will be in accordance with the Oriel Ynys Mon *Guidelines for the preparation and deposition of archaeological archive* (2012; cf. Appendix B).

- Dependent on the results of the fieldwork a summary note or a specific article will be included in the Council for British Archaeology Wales publication *Archaeology in*

Wales. This shall be agreed with GAPS, Cadw and client in advance of publication along with all publication content.

4 PERSONNEL

The project will be managed by John Roberts, Principal Archaeologist GAT Contracts Section. The 2No archaeologists on site will comprise a project officer and project archaeologist. The project officer will be responsible for field management duties, including liaison with GAPS, Cadw, client and landowner. Both the project officer and project archaeologist will undertake the fieldwork, as defined in para. 2.2 and will have joint responsibility for maintaining the site archive. The project officer will be responsible for liaising with any specialists and for preparing any further archaeological works designs; the project officer will also be responsible for submitting the draft final report or interim report. The project manager will be responsible for reviewing and approving the report, which will then be submitted as per the arrangements defined in para. 3.

5 HEALTH AND SAFETY

The Trust subscribes to the SCAUM (Standing Conference of Archaeological Unit Managers) Health and Safety Policy as defined in **Health and Safety in Field Archaeology** (2006).

The GAT field team will be CSCS certified. Copies of the site specific risk assessment will be supplied to the client and site contractor prior to the start of fieldwork. Any risks and hazards will be indicated prior to the start of work via a submitted risk assessment. All staff will be issued with required personal safety equipment, including high visibility jacket, steel toe-capped boots and hard hat.

6 INSURANCE

Public Liability
Limit of Indemnity- £5,000,000 any one event in respect of Public Liability
INSURER Aviva Insurance Limited
POLICY TYPE Public Liability
POLICY NUMBER 24765101CHC/000405
EXPIRY DATE 22/06/2016

Employers Liability
Limit of Indemnity- £10,000,000 any one occurrence.
The cover has been issued on the insurers standard policy form and is subject to their usual terms and conditions. A copy of the policy wording is available on request.
INSURER Aviva Insurance Limited
POLICY TYPE Employers Liability
POLICY NUMBER 24765101CHC/000405
EXPIRY DATE 22/06/2016

Professional Indemnity
Limit of Indemnity- £5,000,000 in respect of each and every claim
INSURER Hiscox Insurance Company Limited
POLICY TYPE Professional Indemnity
POLICY NUMBER
HU PI 9129989/1208
EXPIRY DATE 23/07/2016

7 SOURCES CONSULTED

Coastal Engineering UK Ltd, *Drawings:* 66/1310_05_03 *to* 66/1310_05_10C

Coastal Engineering UK Ltd, *Project ref:* 66/1310 Drawing No: CES316/05-1 Rev C

Chartered Institute for Archaeologists *Standard and Guidance for an Archaeological Evaluation* (Chartered Institute for Archaeologists, 2014).

English Heritage, 2011. Environmental Archaeology: A guide to the theory and practice of methods, from sampling and recovery to post-excavation, 2nd Edition;

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

Evans, R. 2013. *Proposed Flood Alleviation Scheme, Beaumaris: Archaeological Assessment* Gwynedd Archaeological Trust Report 1149

Jones, M and Davidson, A. Rev. 2010. *Beaumaris Drainage Work, Beaumaris, Anglesey: Archaeological Mitigation*. Gwynedd Archaeological Trust Report 869

Oriel Ynys Mon GUIDELINES FOR THE DEPOSITION OF ARCHAEOLOGY (2)

Parry, I. 2014. *Proposed Flood Alleviation Scheme, Beaumaris: Heritage Impact Assessment* Gwynedd Archaeological Trust Report 1200

RCAHMW Guidelines for Digital Archives Version I

FIGURE 01

Site Location – Reproduction of Coastal Engineering UK Ltd, Project Ref: 66/1310 Drawing No: CES316/05-1 Rev C

Proposed Trench Location

Gwynedd Archaeological Trust

Figure X: Location of proposed trench, Castle Meadow, G2347

Existing culvert route
Proposed culvert route
Scheduled area

N

Trench corner co-ordinates:
1 E 260,793.46 / N 376,233.85
2 E 260,801.36 / N 376,235.15
3 E 260,801.68 / N 376,233.17
4 E 260,793.78 / N 376,231.87

Date: 22/06/2015	
Author: NMC	
Office:	
Drawing: G2347/ TL1	
Scale: 1:1250@A3	© Crown copyright and database rights 2013 Ordnance Survey 100023412

0 12.5 25 50
metres

APPENDIX A

RCAHMW GUIDELINES FOR DIGITAL ARCHIVES VERSION I, 2015

19/03/2015

RCAHMW GUIDELINES FOR DIGITAL ARCHIVES

VERSION 1

GARETH EDWARDS

This document is based on:

RCAHMS Guidelines for Archiving of Archaeological Projects version 13, 2013

And is informed by:

Archaeology Data Service Guides to Good Practice
http://guides.archaeologydataservice.ac.uk/

RCAHMW
Guidelines for Digital Archaeological Archives

Maintained by the Royal Commission, the National Monuments Record of Wales (NMRW) is the national collection of information and archives concerning the historic environment of Wales from the earliest times to the present day. It comprises a repository of both hard-copy and digital records, including photographs, drawings, text reports and other material relating to the archaeology, architecture and industrial heritage of Wales. The NMRW collects and preserves this material for the future, with the intention of making it available to the public for study and research. Please see our website for further details about our organisation http://www.rcahmw.gov.uk/HI/ENG/Home/[1] and our Collecting Policy http://www.rcahmw.gov.uk/HI/ENG/About+Us/Policies/Collecting+Policy/[2] .

These guidelines are designed to be used by those producing digital archaeological archives, or archives with a digital component, intended for preservation in the NMRW. Equally, these guidelines can be used by those preparing previously produced digital archives for donation to the NMRW. An archive comprises the complete documentary record of an archaeological project. The aim should be to produce a comprehensive record of work undertaken, and the archive should be structured to allow the information to be understandable and readily accessible by those unfamiliar with the project. Considering the potential for reuse of information at the planning stages of a project onward will aid in the production of a complete and coherent archive. NMRW staff will be happy to answer any questions about the deposit of archive material.

It is in the nature of digital archives that standards evolve in line with changing technologies and we intend to update these guidelines to keep abreast of this. Please see our website http://www.rcahmw.gov.uk/HI/ENG/Search+Records/Standards/[3] to ensure that you have the latest version of this guidance document. We do not currently have prescriptive standards for many specialist survey outputs (e.g. LiDAR, 3D Laser scanning, etc.) and processes creating big data. Please contact us to agree requirements for such archives.

NMRW reserves the right to refer archives back to producers for further work where adequate basic standards of organisation, description and format have not been met.

If you wish to discuss depositing digital records with RCAHMW, or require further information on the suitability of your archive for deposit, formats of record, metadata or configuration of the archive, please contact:

Gareth Edwards, Archive and Library Team Leader, RCAHMW gareth.edwards@rcahmw.gov.uk

Content

Content selection criteria will vary from project to project, however it is imperative that:

[1] The Royal Commission on the Ancient and Historical Monuments of Wales Website, RCAHMW, 19/03/2015

[2] The Royal Commission on the Ancient and Historical Monuments of Wales Website, RCAHMW, 19/03/2015

[3] The Royal Commission on the Ancient and Historical Monuments of Wales Website, RCAHMW, 19/03/2015

- All texts and supporting images that may comprise a final report or publication must form the core of the deposit.
- Any supporting graphics that are embedded into a final report but which are also available in higher resolution or uncropped must be included as separate items.
- All raw (unprocessed) data relating to various specialist survey activities should be included where possible.
- If unprocessed data is not available in digital form, and provision cannot be made to scan it electronically, it can be supplied to NMRW as hardcopy. Adobe Portable Document Format (PDF/A-1a or PDF/A-1b) files are accepted. However, any constituents that go to make up the PDF file (*e.g.* TIFF files, Microsoft Word document) should be documented and supplied as well.

Duplication must be avoided wherever possible:

- Do not provide data items in more than one file format if their content is identical, unless the original format is known to be at risk or not currently accepted by NMRW.
- When submitting digital images do not include duplicate, near duplicate or extraneous images. NMRW reserves the right to weed and delete such files.
- Where a document exists in several versions, only supply the final (non-draft) version with the assemblage.
- Written correspondence (electronic or scanned hardcopy) relating to the project should not be included *unless* it represents a primary aspect of the project's brief or adds value to the assemblage.
- No material should be included that may be interpreted as being defamatory or libellous to any living person.

Information required

In addition to the digital materials deposited, it is also necessary to supply documentation for the deposited archive. There are three categories of documentation that should accompany a digital resource:

- Archive information Form
- File information Form; and
- Technical documentation (where appropriate)

These are available electronically from our website in MS Excel format and should be returned to NMR in that format, in a folder named 'metadata'. Examples of completed forms are included as appendices to these guidelines. If producers already have similar metadata, covering the required data elements in an acceptable format, this can be supplied, but only through prior agreement with RCAHMW.

Archive Information

We require general information about the archive and the background to its production, together with information on the site or sites involved, and a summary of the archive's contents. This form is relevant to both hard copy and digital archives, or combinations of both. **Appendix A** gives an

example of a completed form. All fields are mandatory unless otherwise marked. One form should be completed for each archive.

File Information

- **Appendix B** gives an example of a completed form used to record basic file details for each item in the archive. All fields are mandatory unless otherwise marked.
- A form should be completed for each group of file types (e.g. Autocad files, .TIFFS, etc.) and the header to the form gives the general information about these, each individual file should then be listed and described below this. (See **Appendix B** examples below).

- All data files must have a logical, single unique file reference which is recorded exactly consistently in the form (see **File and Directory Naming** below).

- Ensure you complete and submit this electronically.

Technical Documentation

Technical documentation is information about items, or groups of items, within the archive which will enable the data to be understood and reused by others (for instance, it may constitute a text document describing all the data tables in a database, detailing how they relate to each other). Technical documentation also encompasses documentation relating to third party material that may be embedded within the resource being deposited. Technical documentation (if applicable to your data) should be submitted with the archive in electronic form only.

Technical documentation can be highly specialised in nature and its format or elements will vary depending upon the type of data to which it refers. As a basic requirement, technical documentation, where necessary, must be sufficient to allow archive items, or groups of items, to be accessed, understood and reused by future users of the archive.

NMRW does not use or record formal data elements for technical documentation. A copy of depositors' technical documentation is stored with the archive and supplied to users when requested. It is the depositor's responsibility to ensure that the technical documentation is accurate and complete – NMRW will not verify or validate complex technical documentation.

A good source of practical advice for provision of technical documentation is the Archaeology Data Service (ADS) series of *Guides to Good Practice*. General guidelines relating to technical documentation for archaeological excavation and fieldwork are available at: http://guides.archaeologydataservice.ac.uk/g2gp/Main[4]. The guide covers technical metadata under the relevant chapters on each data type. Where producers are unsure if technical documentation is required or need further information, they should take specialist advice.

[4] Archaeological Data Service Website, ADS, 19/03/15

Formats and Conventions

Media Formats

Digital archive files will be stored, uncompressed on an archive server, but in order to transfer them to us, the NMRW currently accepts digital archive in the following common media formats: CD-R; CD-RW; DVD-R; DVD-RW; and external hard disk. Alternatively, archive can be delivered by attachment to email or made available for download via a secure web-based file sharing application such as OneDrive, where it may be convenient to package and compress complex archives using file compression software, (e.g. WinZip, GZip, etc.)

NMRW cannot routinely accept deposition of digital archive using: Iomega Zip discs; DLT, DAT, TK50 or QIC tape cartridges; CD-DA, CD+G, CD-I or CD-Text discs; unusual/outdated (*e.g.* 8" and 5.25") magnetic discs; or solid state storage devices. In limited circumstances we may be able to accept such formats for legacy data, but please contact us in the first instance.

NMRW would prefer to receive media formatted under (or for) the Microsoft Windows platform.

Avoid adhering gummed or sticky labels to the surface of CD-ROM. Use a water-based, non-permanent soft-pointed marker to write the Unit name, project code, site name and date on the CD-ROM rather than the CD Case or wallet.

File Formats

Wherever possible, depositors must supply digital material in file formats that are listed in **Appendix B**, Recommended Formats. If this is not possible, contact the NMRW Archive for advice. This appendix provides a list of required file formats for a range of data types relating to archaeological and architectural activities.

Where the original format used is bespoke, very newly developed and/or not widely accepted, it is essential that items are also supplied in a more common format to ensure they are useable and retrievable. Depositors therefore, may supply a single item in more than one format. Please indicate the duplication in the File Information Form (use the Description column), together with details of any data loss observed between format versions. Please consult with us for advice on surrogate digital formats.

File and Directory Naming

NMRW has a few special requirements for file and directory naming other than those imposed by popular operating systems. File directory names should be easily understood by those outside of the project, and whilst there are no formal requirements for the internal arrangement of, or maximum levels of nesting within, an archive's directory structures, levels of nesting should be kept to a minimum, should be logical, and should not contain duplicate files.

It is essential that:

- Each project directory should contain a folder named 'metadata' and this should contain the completed electronic copies of the metadata forms supplied by NMRW.
- The period character ('.') is not used in directory names, and is reserved for separating the file extension from the name.
- The space character should not be used in file or directory names (replace with the underscore character).
- Directory and file names may be upper, lower or mixed case.
- Filenames should be logical, unique, be kept as short as reasonably possible, and be entirely consistent with the file name as recorded in the File Information metadata.

- When naming files with consecutive numbers use the same number of characters throughout (i.e. for 1-100, use 001 to 100 otherwise this causes us difficulties).

Archive Ownership and Intellectual Property Rights

- NMRW requires that depositors transfer the physical ownership of archive material to the organisation via a signed Deposit Agreement to aid its successful curation, an electronic copy of this form is included as **Appendix C** of this document
- It is essential that the Intellectual Property Rights (including Copyright) of the archive are established, and any special conditions attached to material made clear at the time of deposition with NMRW.
- Intellectual Property Rights can be transferred to NMRW as part of the Deposit Agreement. If a depositor wishes to retain Intellectual Property Rights for the material they have created then this may be noted on the Deposit Agreement form, but depositors must allow NMRW to disseminate material as per their advertised terms and conditions.
- In the event of an organisation holding copyright ceasing to exist, notification of this should be made to NMRW, as soon as possible, with details of any new arrangements.

Appendix A

Archive Information Form

Project Information		
Organisation Name		
Trowel Archaeology Ltd.		
Project Name		
Pen Caer Evaluation		
Project Code	***HER Event PRN***	***Project Dates***
TA0213	303897	June - July 2013
Project Manager		***Type of Project (i.e. Watching Brief, Evaluation...)***
Dai Rhaw		Evaluation and Excavation
Sponsor/Client		
Cadw		

Site Information		
Site Name (and Address if appropriate)		
Pen Caer Hillfort, Aberffug		
NGR	***NPRN (NMRW site number, if known) or HER PRN***	***Site Classification (i.e. Hut Circle)***
NS 598 651	NPRN 94568	Hill Fort

Archive Contents – Digital Material (please provide metadata on appropriate form)	
Method of Transfer and quantity	6 CDs
Size (specify if KB, MB or GB)	1.8 MB

File Information Form

Organisation/individual depositing the material	Name of project, Originator Project Code (if available)	Date form compiled
Trowel Archaeology Ltd.	Pen Caer Evaluation TA0213	29/06/2013
Operating system Vendor	**Operating system Name**	**Operating system Version**
Microsoft	Windows 2000	Version 4.0
Software Name (Vendor + application name + version)	**File Extension**	**Total Number of files submitted of this type**
AutoCAD2000	DWG	1
Hardware/Capture Devices : Make	**Model**	**Type**

Filename	Path (depositors pathway structure)	Description of file's content	Linked file(s) *This field is optional*	Technical documentation files *This field is optional*	Notes *This field is optional*
TA0213-Report-001.dwg	TA0213/report_illustrations	Plan of outer rampart, Fig. 1 in finished report.	TA0213/report_illustrations/TA0213-Report-010.pdf	TA0213/report_illustrations/Technical_Documentation/Outer_Rampart_Plan.doc	Component of full finished plan, see file under 'Technical Documentation'.

Organisation/individual depositing the material	Name of project, Originator Project Code (if available)	Date form compiled
Trowel Archaeology Ltd.	Pen Caer Evaluation TA0213	29/06/2013
Operating system Vendor	**Operating system Name**	**Operating system Version**
Microsoft	Windows 2000	Version 4.0
Software Name (Vendor + application name + version)	**File Extension**	**Total Number of files submitted of this type**
Adobe Photoshop 12	.TIF	105
Hardware/Capture Devices : Make	**Model**	**Type**
Nikon	D80	Digital Camera

Filename	Path (depositors pathway structure)	Description of file's content	Linked file(s) *This field is optional*	Technical documentation files *This field is optional*	Notes *This field is optional*
TA0213-Photos-001.tif	TA0213/photography	Trench 3, from south-west, showing burnt layer.			.
TA0213-Photos-002.tif	TA0213/photography	Trench 3, from north, showing post hole.			.
TA0213-Photos-003.tif	TA0213/photography	Trench 4, from south, showing post hole.			.
Etc.....					

Notes for File Information Form

Please give as much detail as possible for each field for each file being deposited. If you do not have the information to complete all fields please indicate this e.g. 'Microsoft Fox Pro, Version information unknown'. Complete a different header section and begin a new list if the details relevant to the file(s) being listed change (e.g. if a set of files are produced through a different operating system or application)

1. **Filename** - Please provide the file name exactly consistent with that used for the file (do not use 'spaces' in file names if possible, use underscore/dash etc.)
2. **File extension** - Please indicate this clearly (upper or lower case)
3. **Path** - Please indicate pathway within the archive folder supplied to us, as designated by data manager
4. **Description of file content** – What you would expect to see when you open the file e.g. Elevation of West front showing blocked doorway
5. **Linked files** – Names of any files upon which this file depends for content, but which are not embedded in the file itself. Include path info if required.
6. **Technical Documentation Files** - Name of any file that documents the internal structure or content of this file and give technical information on its configuration or use.
7. **Notes** – Allows for input information not shown anywhere else.

REQUIRED FILE FORMATS

Appendix B

The following table lists all file formats that NMRW is currently capable of accepting. Other formats may be acceptable under certain circumstances, but producers must contact the NMRW Archive if you wish to submit data in formats other than those listed below.

		File Format	Additional Documentation (if relevant/available)/Notes
Text	*Preferred*	Adobe Portable Document Format ISO Standard for Archiving (PDF/A) - .pdf Microsoft Word - .doc	• Documents must not be locked to editing or password protected. • HTML, XHTML – include any relevant CSS files • XML – include relevant schema/DTD/XSLT
	Accepted	Adobe Portable Document Format - .pdf Microsoft Word - .docx OpenDocument Text - .odt TXT, HTML, XHTML, XML, SGML	
Images (see below for further details)	*Preferred*	Tagged Image File Format (Uncompressed) - .tif	• **Uncompressed .tif files are required as mandatory for any new work. We will only accept .jpg files from historic archives where .tiffs are not available.** • Captions must be included for all image files • Images must be at least 1200 pixels along longest edge. • Images must have a resolution of at least 72dpi.
	Accepted	Joint Photographic Expert Group - .jpg JPEG2000 - .jp2 Tagged Image File Format (Compressed) - .tif Portable Network Graphics - .png	
CAD (Vector Graphics)	*Preferred*	Scalable Vector Graphic - .svg Adobe Illustrator - .ai AutoCAD - .dxf	• Relationships to other files • Captions must be included for all graphics files
	Accepted	CorelDraw - .cdr AutoCAD - .dwg	
Spreadsheets	*Preferred*	Comma Separated Value - .csv Excel - .xls	• Column/Rows should have clear labels describing their contents • A key should be provided for any codes with the data • Spreadsheets must not be locked to editing or password protected
	Accepted	Microsoft Office - .xlsx OpenDocument Spreadsheet - .ods	
Databases	*Preferred*	Microsoft Access - .mdb Delimited Text	• A data dictionary should be included where available • For delimited text the delimiters should be listed • Databases must not be locked to editing or password protected
	Accepted	Microsoft Access - .accdb OpenDocument Database - .odb	
GIS	*Preferred*	ESRI Shapefile - .shp, .shx and .dbf ESRI Geodatabase - .xml	Information should be provided on: • The purpose of the GIS • The function of each layer • Coordinate system used • Method of capture • Data source • Scale/resolution • Assessment of data quality • Date of capture
	Accepted	Flat file data as Microsoft Excel, Comma Separated Values or Microsoft Access formats - .xls, .csv or .mdb MapInfo - .mid and .mif	
Geophysics	*Preferred*	Raw xyz data: .txt, .csv, .xyz Rendered Images: .tif	For raw xyz data: • Location of the survey • Conditions • Instrumentation For rendered images: • Details of data processing and interpretation
	Accepted	Rendered Images: .jpg, .png (see above)	
Video	*Preferred*	Mpeg-1, Mpeg-2	• Shorter clips of submitted video films should also be submitted for dissemination purposes. • Shorter clips should be web optimised where possible.
	Accepted	Mpeg-4	

Digital Images Guidance

Ensure that the images you are submitting are of the highest standard for you equipment and *at least* between 300 and 400 dpi (dots per inch)/ppi (pixels per inch).

Photographs must all be in uncompressed TIFF format when producing new photography (we will accept JPEG files only for existing archives, where no TIFF files are available).

Minimum file sizes for all digital images should be 1-2 MB but ideally images should be larger than this.

Image quality is also an important factor when selecting images to deposit. All photographs should be sharp and well exposed, and duplicates should be weeded.

Notes:

There are three main file formats used by digital cameras to create images; JPEG, TIFF and RAW, the most common being the JPEG file format. On some digital cameras it will be the only file format available, although more sophisticated digital cameras will allow you to choose between JPEG, TIFF and RAW. For new survey work, where cameras do not produce TIFFs directly, images should be output as RAW files and converted to uncompressed TIFF format. Images must not be produced as JPEGs and subsequently converted to TIFFs. As previously stated, we will accept JPEG files only for existing archives, where no TIFF files are available.

Uncompressed TIFF file format is the preferred choice for archiving images as it keeps the original quality of an image over time.

Do not submit RAW files, these are hardware dependent files and cannot be supported for future access.

The preferred settings outlined above have been chosen to allow content to be stored at an archive standard and also to allow reproduction at a scale suitable for printing and display purposes.

Most cameras give a quality option within the menu of Small, Medium and Large. In order to produce high quality images, you will need to set your camera on the Large or Medium option in order to give an image of 5-10 Megapixels.

Comisiwn Brenhinol Henebion Cymru
Royal Commission on the Ancient and Historical Monuments of Wales
CBHC RCAHMW
Cofnod Henebion Cenedlaethol Cymru
National Monuments Record of Wales
Noddir gan Lywodraeth Cymru
Sponsored by Welsh Government

ARCHIVES DEPOSIT AGREEMENT

Deposit		
Acc. No	**Date**	**Ref**
Depositor		
Name		
Address		
Postcode	**Email Address**	
Tel. No	**Fax No**	
Details of Deposit		
Title		
Description		
Quantity and Condition		
Provenance		
Restrictions and Copyright		

Details of Deposit Agreement

As the Owner/Depositor acting on behalf of the Owner (delete as appropriate) I certify that the above information is correct and that I have read and understood the terms and conditions of deposit on the reverse of this form. I hereby agree to:

☐ Gift the above item(s), with the copyright, to the Crown under the authority of the Archivist at the National Monuments Record of Wales, Royal Commission on the Ancient and Historical Monuments of Wales. The item(s) are offered as absolute and unfettered gifts to be placed within the public archive and made available to the public as per the terms and conditions overleaf.

☐ Deposit the above item(s) on loan to the National Monuments Record of Wales, Royal Commission on the Ancient and Historical Monuments of Wales under the authority of the Archivist under the terms and conditions overleaf, retaining copyright but allowing the Royal Commission to licence and administer the copyright on my behalf.

☐ Deposit the above item(s) on loan with the National Monuments Record of Wales, Royal Commission on the Ancient and Historical Monuments of Wales under the authority of the Archivist, as per the terms and conditions overleaf. I wish to retain copyright and be contacted each time an enquirer wishes to use the item(s) other than for private research.

Signature (Depositor)	**Name** (BLOCK CAPITALS)	**Date**
Signature (Archivist)	**Name** (BLOCK CAPITALS)	**Date**

Royal Commission on the Ancient and Historical Monuments of Wales
Plas Crug, Aberystwyth, Ceredigion SY23 1NJ
Tel: +44 (0)1970 621200 Fax: +44 (0)1970 627701 Email: nmr.wales@rcahmw.gov.uk Website: http://www.rcahmw.gov.uk

TERMS AND CONDITIONS OF DEPOSIT

General

1. The deposited items are accepted upon the following terms except as may be expressly varied in writing by the parties hereto which variation should be appended to this agreement.

2. For the purpose of this agreement the Royal Commission on the Ancient and Historical Monuments of Wales (hereafter referred to as the RCAHMW) shall act through its Archivist with respect to any consent, notice, approval, requirement or any other action of the RCAHMW referred to under this agreement or through such other officer of the RCAHMW as may from time to time be determined and all notices and communications from the Depositor to the RCAHMW under this agreement shall be addressed to that Officer.

3. All deposited items may be examined, inspected or exhibited at the discretion of the RCAHMW with or without charge but the RCAHMW shall not by virtue of deposit be obliged to make items available for inspection or for any other purpose.

4. All copyright in any deposited item shall be retained by the Depositor where the Depositor is entitled. The Depositor may assign or gift the item and the copyright, where entitled, to the RCAHMW which agreement between the parties should be noted overleaf.

5. All deposited items may be made available or copied to third parties for the purposes of private research and study and copies of all items may be made available by RCAHMW for non-commercial purposes via the World Wide Web at the absolute discretion of the RCAHMW.

6. The RCAHMW shall store the deposited items in such conditions as it sees fit in its absolute discretion and shall not be liable to the Depositor in any circumstances for any loss or damage to the deposits from whatever cause howsoever arising.

7. The RCAHMW shall be at liberty to mark the records with any mark of reference or index.

8. The RCAHMW shall be at liberty to carry out any repair or conservation work as it shall in its absolute discretion determine and shall not be liable for any damage so caused.

9. The RCAHMW reserves the right to return items to Depositors if such persons can be traced following reasonable enquiry.

Withdrawal

10. All Depositors shall be entitled to remove temporarily deposited items for three months in any period of up to twelve months. All endeavours will be made to meet such requests without delay but Depositors should, whenever possible, give prior warning to the RCAHMW and the RCAHMW shall not by virtue of this condition be responsible to produce any deposited item earlier than 21 days following the receipt of written notice of withdrawal.

11. Deposited items may be withdrawn from the RCAHMW for periods longer than three months in any twelve months or absolutely but upon such withdrawal the Depositor shall be liable to the RCAHMW for the costs and charges accrued at the time of withdrawal in respect of the cost of cataloguing or producing a calendar of the deposited items, the cost of all conservation work carried out in connection with the deposited items and a charge in respect of the costs of storage. RCAHMW may, at its discretion, waive any or all of these costs and charges.

Confidential Items

12. If requested by the Depositor, deposited items which are confidential will only be made available for public inspection, research or other purposes with the agreement of the Depositor during the period of 30 years from the date of creation of the item or such longer period as may be agreed by the RCAHMW.

Cataloguing

13. Catalogues or calendars of deposited items prepared by the RCAHMW (if any) can be supplied to Depositors free of charge (2 copies) but otherwise shall be the property and the copyright of the RCAHMW and shall be made available to the public and others upon such terms as the RCAHMW may determine.

Insurance

14. If the Depositor wishes the items on deposit to be insured against any risks whatsoever the Depositor shall be responsible to take out such insurance and shall be responsible to discharge the costs thereof. In such circumstances while the items are deposited the RCAHMW's interest should be noted on the policy.

Depositor or Persons Claiming through the Depositor

15. For the purpose of this agreement the Depositor shall mean the person, persons or body upon whose authority records are deposited with the RCAHMW, or other person claiming to be the owner of the deposited items or the authorised agent of the owner as may be recognised under condition 16. The Depositor shall supply to the RCAHMW their full name and address to which all communications may be sent and shall promptly inform the RCAHMW of any change in their address and shall if requested by the RCAHMW produce to the RCAHMW any evidence certificate or other documentation which will establish their ownership of the deposited items.

16. The RCAHMW shall not be obliged to recognise persons claiming to be the Depositor as defined in condition 15 except where satisfactory evidence of such title or the validity of such claim has been shown to the satisfaction of the RCAHMW or such other solicitor or barrister instructed by the RCAHMW. Such persons claiming by virtue of acquisition of ownership from the original Depositor should inform the RCAHMW promptly of their acquisition of such title whereupon the RCAHMW shall when satisfied as aforesaid amend the list of Depositors accordingly.

17. Where for any purpose arising under these terms of acceptance or otherwise the RCAHMW wish to contact the Depositor in connection with any deposited item it shall be sufficient for the RCAHMW to write to the Depositor for the time being recognised by the RCAHMW in accordance with clause 16.

18. In the event of the RCAHMW being unable to contact the Depositor despite reasonable enquiry then in relation to all matters where the consent or agreement of the Depositor is required the Depositor shall be deemed to have given such consent or agreement and in the event of the RCAHMW wishing to terminate its retention of any deposited item the RCAHMW shall be at liberty to dispose of the deposited item as it sees fit including destruction in appropriate cases. It should be noted that destruction will only be considered when all other possibilities have been exhausted, including offering the deposited items to another appropriate repository.

APPENDIX B

ORIEL YNYS MON GUIDELINES FOR THE DEPOSITION OF ARCHAEOLOGY, 2012

Oriel Ynys Môn
Guidelines for the preparation and deposition of archaeological archive

1. Introduction

The storage and curation of an archaeological archive is time consuming and costly. In order to maximise the Museum Service's available storage space and ensure that the archives can be easily accessible, the following guidelines for depositing archaeological archives have been introduced.

Anglesey Museums Service is prepared to accept material from archaeological fieldwork undertaken on the Isle of Anglesey provided the following conditions are met. However, Anglesey Museums Service reserves the right to refuse any archaeological material that has been retrieved without regard for these conditions and standards of fieldwork and archive generation defined by the Institute for Archaeologists (IfA), CyMAL and Cadw.

2. Archaeological Archive Standards

2.1. Location of fieldwork

The fieldwork site shall fall within the boundaries of the county of Anglesey.

2.2. Contact prior to fieldwork

Arrangements should be made with Anglesey Museums Service during the project proposal stage with details of the requirements of title transfer and copyright to the museum. In response to this Anglesey Museums Service will make available local standards for the submission of an archaeological archive where needed. Once confirmed and arrangements made for the deposition of the archive, Anglesey Museums Service will allocate the archive a unique museum identity number (accession number). Anglesey Museums Service will only retain the finds and environmental archive, along with supporting paper and digital archive where necessary. Arrangements should be made with the RCAHMW for the deposition of the paper, photographic and digital archive.

2.3. During fieldwork

The Museums Service will ensure that the condition and security of the archive material is maintained by the archaeological contractor during fieldwork.

2.4 Contact following fieldwork

After the completion of fieldwork and during the Assessment of Potential for Future Analysis stage (Phase 3 MAP2) the archaeological contractor should contact Gwynedd Museum Service with a reasonably quantified list of the material to be contained within the archive so that space can be made available for it. An expected date of deposition should also be agreed at this stage. During the subsequent stages of this project the Museum Service should be kept fully informed.

2.5 Deposition agreements
Before an archive can be accepted by Anglesey Museums Service, the depositing organisation or individual must complete and sign a museum entry and acquisition form and agree to any special conditions the Museums Service might wish to attach to the deposition. A complete inventory of the archive must accompany the entry form by the depositing organisation or individual. The Museum will ensure the correct storage and care of the archive after donation.

2.6 Ownership of finds
The ownership of material within the archive should be fully documented and the title transferred to the Isle of Anglesey County Council in perpetuity at the time of deposition. The acquisition form for the transfer of title of the finds archive must be signed for by the archaeological contractor undertaking the fieldwork provided that written agreement has already been given by the landowner for the archaeological contractor to deposit the archive as they see fit. It is the responsibility of the organisation or individual undertaking the fieldwork to obtain the consent of the landowner in writing for finds and donations within the receipt of the museum. Anglesey Museums Service will only accept donated material and will only consider a loan arrangement for exhibition purposes or other exceptional circumstances.

2.7 Intellectual Copyright
The Museum Service reserves the right to research, study, display, publish and provide access to an archive in its care.

2.8 Incomplete Archives
There should be a presumption against splitting any archaeological archive. If any part of the finds or environmental archive is to be deposited elsewhere it should be fully documented and clearly stated in advance of deposition. Any material which has been discarded lost or destroyed should be recorded. Any items that have been removed from the archive for conservation or specialist identification and analysis should be returned to the archive before it is handed over to the Museums Service.

2.9. Selection, retention and disposal of material
Any decision to dispose of any part of the archive should be made prior to deposition and agreement between the depositor, the Museums Service and any relevant specialist. Decisions should be made on the basis of the Museum's Acquisition Policy, IFA guidelines and SMA 1993 guidelines. It is important that material finds retained for long-term storage are relevant to the interpretation of the site.

The Museums Service will not accept unprocessed environmental or slag samples or any highly unstable items.

2.10. Cost
The Museums Service does not currently charge for storage or curation of the archaeological archive which meet the requirements of this document. The Museums Service will not cover costs of transporting the archaeological archive.

3. Preparation of the finds archive

All archaeological material should be deposited in a stable condition. Waterlogged material should be conserved and brought to a stable, dry state before deposition.

3.1 Preparation

All finds, samples and other records should be physically prepared (e.g. cleaned and marked), numbered, packed and listed prior to deposition. Primary conservation, including x-ray of metalwork, investigative cleaning and stabilisation should be completed before the finds are deposited with Anglesey Museums Service. A full record of any specialist conservation work, which has been carried out on any individual item or all or part of the archive should be presented with the archive.

3.2 Packing

All finds should be boxed in archive quality boxes to conform with the Museums Service standard size of 370mm x 290mm x 250mm (height). Group/bulk finds should be boxed by material type. The contexts contained in the box should be clearly labelled on the outside of the box with the site name, site code and find number/accession number. Re-sealable polythene bags of appropriate size should be used for the storage of non-sensitive material types.

All potentially unstable finds, such as metalwork, glass etc should be packaged within an airtight polyethylene boxes containing self-indicating silica gel which is equal to approximately one third of the volume of the box, as well as a humidity card. Artefacts should be separated from the silica gel with material such as acid free tissue. Delicate finds should be packaged in archive sound foam.

Finds boxes should be marked with the site name, code and museum identity (accession) number.

3.3 Organisation

Finds bags should be arranged in numerical order using the museum acquisition number.

3.4 Documentation

The depositor should provide two copies of an inventory listing the contents of the archive. All finds in the deposited archive should be listed in a digital format to be compatible with the Museums Service system. Any databases should also be provided with initial consultation with the Museums Service.

These minimum standards for the management, documentation and care of collections are designed to ensure legal, intellectual and physical protection of the archaeological archive.

November 2010

APPENDIX C

Photographs and other digital data: a guide to production and archiving (GAT internal document, 2014)

Photographs and other digital data: a guide to production and archiving

Version 2.3, October 2014

CONTENTS

Photographs and other digital data: a guide to production and archiving

INTRODUCTION

Gwynedd Archaeological Trust, like most organisations, is relying more and more on digital data. Much of that data provides the primary record for archaeological sites and it is our duty to ensure that it is produced and archived to appropriate standards. This is particularly important for digital photographs that now form the only photographic record for many projects.

This document aims to provide a comprehensive guide to taking, downloading and archiving digital photographs and archiving other digital material. Archiving digital data should obviously go hand in hand with archiving finds and paper records

FOLDER STRUCTURE

When setting up a project it is important from the start to make sure that there is a place for everything and everything is in its place. All project information must be kept on the P Drive and not on personal computers unless there is a very good reason to do so. It is very important that all information is in one place and all staff can access it when they need to.

All project staff can create sub-folders within a project folder as long as these follow the structure described above. The lead staff member on each project can create the main folder for that project.

No other folders should be created on the P Drive without consultation with John. All files should be put in project folders and not elsewhere unless there is a good reason.

A project folder should be set up on the P Drive and all data (other than photographs) should be kept there. For different phases of a project create folders within the main project folder not new independent folders. Keeping folders tidy and clearly labelled is critical for anyone else taking over the project or needing to find anything. It is particularly important to keep the final versions of reports (both full pdfs and text) clearly separate from earlier versions. There is an example of a folder structure at P:\Projects Active\G0001, folder template V2.

The structure will obviously have to be altered for different projects but please use this as guidance and subtract or add sub-folders as necessary following the general character of the structure. **NB. You are strongly encouraged to add sub-folders as appropriate to your project, especially in the fieldwork folder.** However please note that there is a folder for data that will be relevant through all phases of the project, this includes survey data, Mapinfo workspaces and the main HER database. Also note that **scans of field records** etc are to be put into an **archiving folder** not in the folder for the specific phase of work. This makes them easier to find for archiving.

Please feed-back to Jane any problems or issues with this folder structure. If there is something that everyone dislikes it can be changed.

File names

The back-up system now in use has problems coping with addresses for files that are over 256 characters long. When creating file names and additional sub-folders please make sure the name is not unreasonably long. This does not mean that you have to abbreviate everything or use file-names that make no sense to anyone else. It is really useful if your file name gives some indication about the contents of the file so that it is easy for other people to find. File names of up to **20** characters are unlikely to cause a problem but try not to exceed this.

PHOTOGRAPHS

Formats

There are three main formats that might be used to produce digital photographs: TIFF, RAW and JPG. Each has their own advantages and disadvantages.

TIFF files are recommended for long term storage as this is a lossless, open-source, well-supported format. This is the preferred format of digital images, however file sizes are very large and many cameras cannot produce TIFFs. All image files sent to other bodies for long term storage will be converted to TIFFs before sending but the current policy is for the Trust not to hold TIFFs itself. This policy will be kept under review.

RAW files are the camera manufacturers designated files (Nikon RAW files end in .NEF) and are initially downloaded and processed using the manufacturer's software. These are not acceptable for archiving as the software to read them may become obsolete but they contain much more information than a JPG allowing more image editing and processing. At present these are to be the preferred format for GAT photographs and will be stored long-term on the GAT system but will be converted to TIFFs for off-site archiving.

JPG files are the ones that are most often used in reports etc and will generally be created by conversion from the RAW files.

Taking photographs

Selecting the appropriate format

GAT policy is now to take RAW (NEF) files as standard in all projects. Set the camera to take RAW plus a low resolution JPG.

Choosing and setting up your photograph

Take care when taking photographs, badly taken photographs that do not show the necessary detail are not worth taking. Don't just automatically photograph a single feature. Does it make more sense within the context of neighbouring features? Do you need a shot of a group of features? As each photograph adds to the time it takes to archive them unnecessary photographs should be avoided, although this should not put people off from taking general shots to put sites into a landscape context.

Feel free to take working shots or general photos, especially if something unusual is happening. Normally these are taken by supervisors or the site director but they may be busy so if you have the cameras record the event. Site photographs are used for many purposes: publication, talks, websites, outreach, etc. Consider taking some photographs suitable for these purposes.

Consider if a photograph is necessary. A pre-excavation shot of a feature may not be worthwhile if that feature is just a brown splodge, but if it has stones it might be worthwhile, especially if it is decided just to sketch the stones. In general only take one photo of each shot. If you are unsure whether it has come out zoom into the image on the camera and check. If it is poor quality delete it and try again. However if it is hard to see the image on the camera, in bright sun etc., a safety shot may be necessary. Always delete any failed or accidental shots straight away.

For standard archaeological shots ensure the feature is clean and soil, tools etc. are removed from the frame. If the soil is dry spray it with water so the colour shows well.

Consider the lighting. Try to avoid taking photos with dark shadows across. If it is not possible to avoid then set up a sheet or other means to shade the whole feature. Building recording will often require lights and a generator. Consider what might be needed and arrange to use or hire the appropriate equipment. On excavations general avoid using a flash if possible. If it is dark but you have to get a photo try one shot with the flash and one without.

If light levels are low use a tripod. The digital camera can function in low light levels but there is an increased risk of out of focus shots. A tripod should be available on all sites in winter. Building recording should use a tripod as standard.

For most site photographs a scale and board **must** be used. Chose appropriate sized scales. If using more than one scale ensure they are placed so that they appear at right angles through the view finder. Frame the shot so that at least one scale is parallel to the frame of the photograph.

Make sure that neither the photo board nor the scales are obscuring an important part of the shot.

On the **photo board** write the **site code**, the main **context** numbers and mark a **north arrow** using a compass. In most cases the cut number of the feature or features are the only context numbers needed, but the photograph may be of a group of features or of a layer in which case the appropriate numbers would be used. Do not list all the fill numbers for a section or add numbers of features or deposits that are not the main focus of the photograph. If you have too many numbers on the board it will not be readable on the photograph.

Place the board quite close to the camera and prop the board up if necessary so it can be easily read. If using a chalk board avoid photographing in the rain when the writing will be washed off the board.

Taking the shot
Generally the digital camera used will be an SLR camera, so what you see through the view finder is the picture taken by the camera. It is designed for the view finder to be used to compose photographs, not the screen.

Every time you turn the camera on check the screen. If the battery symbol is only 1/3 full tell your supervisor to ensure the battery is charged as soon as possible.

As soon as you have finished taking photographs turn the camera off and replace the lens cap.

Use the AUTO setting or if there is low light but you do not want to use a flash use the flashless setting (zig-zag arrow with line through in a circle). Setting 'P' will work as well.

Adjust zoom lens to frame shot as required.

Press shutter button half-way down to allow camera to adjust for auto-settings and auto-focus. When red light shows in central rectangle the nearest object is in focus. If you keep your finger pressed down you can move the camera to change the composition while keeping the exposure and focus set for the object initially aimed at.

Press the button down fully to take photograph.

To view photograph press button to left of screen with arrow in rectangle. Press dots to left and right of the 'OK' button to scroll through shots. Use dustbin button to delete unwanted photos, but be careful not to delete any other photos by accident.

If you are competent at photography and want to use the manual or other modes consult the camera manual. Switch camera back to automatic when you have finished.

As soon as you have finished taking photographs turn the camera off and replace the lens cap.

Recording photographs

Like finds without a context photos without information are almost worthless. On all excavations and watching briefs photo registers must be filled in and should be as full as possible.

On assessments and other small projects, depending on the complexity of the project and the quality of the individual's memory, it may be possible to save time on site by not completing a paper photo record but putting all the information directly into the photo database (see below). Clearly this will only work when there is one person involved in the project and if the database is completed very soon after the photographs are taken. If this short-cut is used the database must be completed as soon as possible and not forgotten or delayed about as it will be impossible to reconstruct later.

It is possible to set the camera numbering system to 1 at the start of a project but deleting photos leaves gaps in the numbers. It is generally best to follow the consecutive numbers on the photo register and ignore what is on the camera. Regular downloading and renumbering will catch any errors before they become problematic.

In building recording and most assessments it is important to know where a photo was taken from. Use a paper map or building plan on site to record the location the photo was taken from and the direction it was taken in. A fair digital copy of this must be produced and archived with the photos as a PDF.

Photo register
Fill in the photo register fully, especially ensure that a description of the feature is given and not just the context number. Always include the drawing number of a section so that it can be identified.

Photo No.	Site sub-div	Description	Contexts	Scale/s	View from	Initials	Date
Maintain continuous number sequence for each camera	Trench/area/ chainage	Describe shot, specify type of feature etc, don't just use context number	List all relevant context numbers	Scale length and number of scales (e.g. 2x1m)	Direction from which you have taken the photo	Your initials	Date

Down-loading

Excavations
On an excavation the digital photographs should be downloaded to the site computer **every day**. The photographs are renamed with the site code and photo number as below and are checked against the photo registers to ensure the number on the photograph corresponds with that in the register. At this stage any failed or unnecessary photographs can be deleted and the quality of the photographs can be checked.

Once renamed the photographs are backed up onto a USB drive. When the photographs have been successfully renamed and backed-up the images on the camera should be deleted. However, do not delete them before this as renaming can occasionally go wrong and the easiest solution is to download the photographs again and start from scratch.

As often as possible and **at least once a week** the photographs should be transferred to the **U-drive** in the Trust office. These form the archival record copies and the images on the site computer are then a back-up.

Photos on the U drive must not be altered in any way. To use the photographs copy the required images to another directory and alter the copy.

The images on the USB drive can then be deleted ready for the next batch of photos.

Obviously if downloading can be done regularly in the office the photos can be saved directly to the U drive. A procedure for downloading, numbering and checking must be agreed with the project manager before the start of a project. Time must be costed for this.

Assessments/watching briefs etc.
Photographs should be downloaded on to the **U-drive** as soon as you return to the office and renamed as below.

The photographs on the U-drive form the archival record copies and **must not be altered in any way**. To use the photographs copy the required images to another directory and alter the copy.

Where to put the photo files

On the U drive create a folder for your project. Create a folder for RAW/NEF files and another folder for JPEGs. Download your files and put them into to their corresponding folder.

If at this point you find out that you have only taken photos in the RAW format then you can batch create JPEGs with the ViewNX2 software (see below). However, this should be done after the files have been renamed so as to save you having to do this twice.

Converting photographs

If you have only taken the photographs in RAW then JPEGs need to be produced. Conversely if you have only taken JPEGs then there is nothing that can be done. Either way you should change the setting on your camera immediately to make sure that in future both Raw and Basic JPEGs are taken.

You should rename the RAW files as below before conversion.

To create JPEGs from the RAW files then you need to install ViewNX2 which can be found at: T:\Programs\View_NX2-32bit.exe (choose either the 32Bit or 64Bit version depending on your computer, if in doubt install the 32bit one). Open up ViewNX2 and navigate to the folder where the RAW files that need to be converted are stored. Once the folder is selected the right pane should show thumbnails of all the photos within the folder. Select all the photos and then click on 'Convert Files' at the top right (you may have to maximise the window to see this).

In the 'File Format' window select JPEG, and move the scroll bar fully to the left on the Quality setting so that 'Highest Compression Ratio' is shown. Under 'Save In' select the folder that you want the JPEGS to be stored in (do not use the same folder as the RAW files). No other settings need to be changed. Click on 'Convert' and the JPEG files will be created. You can now extract the metadata as below and then transfer the files onto the U-drive.

Deleting duplicates

Files are money and we cannot afford to store or archive unnecessary files.

Do not take duplicate shots unless absolutely necessary. Always delete failed shots and mis-shots straight away. If light levels are low or there are other problems that mean you cannot be sure of getting a good shot it may be necessary to take more than one, but the duplicates will have to be deleted once the photos are downloaded.

With an assessment or other small project where you haven't written a paper photo record the duplicates can be deleted before renumbering. Where there is a site photo record and especially where photo numbers are cross referenced to context sheets etc renumber all the photos, including the duplicates and create the photo database. Delete the duplicates as you are filling in the database and note in the database the shots that have been deleted.

Renaming photographs

Files should be given meaningful names and not just left with the camera's automatic filename. It makes most sense to use a continuous sequence of numbers to identify individual shots. These must be related to a paper photo register kept in the field.

Both RAW and JPEG file of the same image must have the same file name (with a different ending). As they are produced on the camera this will be the case, just make sure that the new names given are also the same.

File naming systems should be planned in advance and should use standardized conventions/terms (i.e. GXXXX-001, GXXXX-002 etc; PRN_XXX-001, PRN_XXX-002 etc). File names should not include spaces and full stops and other punctuation is best avoided.

Different phases of a project might be distinguished, e.g. GXXXX-mitigation-001, allowing more than one sequence of numbers to be used but the ideal is to have a single sequence of numbers for each project.

Do not rename photographs by hand as this takes a very long time. There is a program that does the job well as long as the photographs are numbered in the sequence in which they are taken, as is normal in a photo register.

Install the program 'A.F.5 Rename your files 1.1' on to your computer from T:\Programs\File tools\af5v11.exe

Open the program and add the files to be renamed by clicking 'ADD' and browsing for the files (you can also drag and drop the files into the program). This can handle quite a lot of files at once but it does have its limits so if you have hundreds of files to rename you will find that you have to do them in batches.

Before you do anything else go to the 'EDIT' menu and click on 'Sort Filename' and 'By Filename'. This is very important as there is a weakness in the program that means that without doing this the files do not necessarily come through in order, and the order is critical for correct naming of the files.

Set up the 'Rename to' fields.

For each field you can set up a variety of types but **<none>**, **String** and **Counter** are the useful ones. **<none>** is used when you don't need a field; **String** is for alphanumeric fields, and **Counter** adds sequential numbers to the filename. Below are two examples, but set up the most useful system for your project:-

Filename to be composed of site code and shot number

Set first field to **string** and in 'Value' below type site code followed by a comma or -, e.g. 'G1701-'
Set next field to **counter**. In 'Value' type the number range you need to use. This will usually start at 01 and should extend to more than the number of files to be renamed. However, as the filename itself will be alpha-numeric the files will not stay in the correct order for future use unless an appropriate number of zeros are included, e.g. if the total number of photos for a project will be less than 100 your number range can be 01-99, but if it exceeds 100 use **00**1-999. Similarly increase the numbers of zeros if you anticipate exceeding 1000 or 10000 photos.
Resulting filename = G1701-001.jpeg

When everything is ready press '**RENAME'**.
Check the files in their directory to ensure everything has gone OK. If so exit from the program.
If things have gone wrong clicking 'RENAME' a second time will take the filenames back to what they were originally.

Trouble shooting

The main problem that occurs, especially with excavation photographs, is that the photo register does not correspond to the actual photos taken. One too many or one too few shots have been taken, or photos have been voided from the register and not deleted from the camera or vice versa, or shots are out of order compared to the register. This throws the whole sequence of numbers out. Some time will be necessary to put the photos in the same order as the register and to rename them.

Use the A.F.5 program to rename sequential batches of photographs to get them to the correct numbers. BUT this tends to result in you trying to rename a file with a name that already exists. The program will not do this. To get round this use an extra field set to **string**. You can type 'a' in the value or leave it as 'mytext'. This allows double numbering to exist for the short time necessary to get everything renumbered, when you can go through and remove the extra text, again using the program.

If renaming the files and checking them against the register is not done regularly these problems can build up until they are quite daunting to sort out, whereas making sure 40 shots or so are correct is not difficult.

Generally the photo file names should be changed to correspond to the photo register rather than the other way round as the photo register numbers will appear on context sheets etc. and changing them will confuse the whole system.

Metadata

It is important to record what each photograph is of and to link that information to the image file. This just means that you need a digital photo register rather than a paper one and that one of the fields must be the filename of the photograph.

Below is an example of an Access database set up for an assessment project.

Gxxxx												
File reference	Project name	Project phase	Site sub-division	PRN	Contexts	Description	View from	Scale (s)	Type	Date	Originating person	Originating organisation
G2098_006.jpg	G2098 Penrhyn Quarry	Assessment	Area A	1706	1522, 1523	Possible Hut Circle 18	N	2m	Photograph	13/07/2010	Dave McNicol	Gwynedd Archaeological Trust
G2098_007.jpg	G2098 Penrhyn Quarry	Assessment	Area A	1707	1524, 1525	Possible Hut Circle 19	N	2x2m	Photograph	13/07/2010	Dave McNicol	Gwynedd Archaeological Trust
G2098_008.jpg	G2098 Penrhyn Quarry	Assessment	Area A	1707	1525	Possible Hut Circle 19	N	1m	Photograph	13/07/2010	Dave McNicol	Gwynedd Archaeological Trust
G2098_001.jpg	G2098 Penrhyn Quarry	Assessment	Area B	1705	1520	Possible Hut Circle 16	S	1m, 2m	Photograph	13/07/2010	Dave McNicol	Gwynedd Archaeological Trust
G2098_002.jpg	G2098 Penrhyn Quarry	Assessment	Area B	1705	1520-4	Possible Hut Circle 16	S	1m, 2x2m	Photograph	13/07/2010	Dave McNicol	Gwynedd Archaeological Trust
G2098_003.jpg	G2098 Penrhyn Quarry	Assessment	Area B	1704	1519	Hut Circle 17	W	2m	Photograph	13/07/2010	Dave McNicol	Gwynedd Archaeological Trust
G2098_004.jpg	G2098 Penrhyn Quarry	Assessment	Area B	1704	1519	Hut Circle 17	W	2m	Photograph	13/07/2010	Dave McNicol	Gwynedd Archaeological Trust
G2098_005.jpg	G2098 Penrhyn Quarry	Assessment	Area B	1706	1522, 1523	Possible Hut Circle 18	N	2m	Photograph	13/07/2010	Dave McNicol	Gwynedd Archaeological Trust

A template for this database can be found at P:\Project Management\Current Templates\Photo & Metadata\Gxxx Photo and metadata database.mdb. Copy this to your project folder on the U Drive and change the file and table name to your project code. To make the form work the link between the table and form will need changing. Ask if you don't know how to do this.

You can add any fields appropriate to your project and remove any that are not appropriate but always include the File Reference field.

The most important thing is that the file reference in the database is **exactly** the same as the file name on the correct photo, including the correct file ending. There is a simple way of getting this information quickly into the database (see below). The number should also relate correctly to photo numbers recorded on context sheets etc. If there are numbering problems and photos have to be renumbered or if separate databases are amalgamated to create a single database this must always be held in mind. If there is any discrepancy sort it out straight away.

Inputting the Metadata:

Once you have renamed your files and are ready to start inputting the metadata into the Access database then there is a quick and easy way to get a large amount of the information into the database without repetitive typing:

You should already have ViewNX2 installed but if not install it from T:\Programs\View_NX2-32bit.exe (choose either the 32Bit or 64Bit version depending on your computer, if in doubt install the 32bit one).

Open ViewNX2 and browse to find your photos. Select all your photos. Go to "File", "Export file and camera information". Give a useful name to the file and in "save as type" select CSV. A CSV file will be saved containing lots of information from the files.

An Excel spreadsheet has been created with the same headings and order of fields as the Access photo database (P:\Project Management\Current Templates\Photo & Metadata\Photo database creation aid.xlsx). Open a copy of this and copy in your file names from the CSV file and the dates into the correct columns. The date comes through with the time. To get rid of the time in Excel select the date column, and click on 'Find & Replace'. In the 'Find what' field type in ' *' minus the ' (so space then star), and leave the 'Replace with' field blank. Click on 'Replace All'. This basically deletes the time stamp from this field but leaves the date intact.

Use the Excel spreadsheet to fill in all the repetitive fields. In Excel (unlike Access) you can select a whole column and copy a single entry into it in one go. If you want you can also fill in the Description etc in Excel.

Select all your filled-in fields in Excel (not the column headings) and copy into Access. In Access select the row marked with a star and paste. A pop up should appear saying that you are about to paste 'x' amount of records, click on 'yes'. If it all works OK then delete the Excel file.

To speed up the inputting of the other fields you can also use a quick shortcut for repetitive entries: For example, within the 'Originating Person' field you may have two or more entries, lets say Dave McNicol and Iwan Parry. Rather than typing this in each field or even copy and pasting each field individually you can type a number such as '1' for Dave McNicol and '2' for Iwan Parry, and once all the records have been entered, select the column and use the 'Find & Replace' function to replace '1' with Dave McNicol and '2' with Iwan Parry etc.. This method can also be used within the description field where you can use 'p/h' and replace it with 'posthole' for example.

This may sound a bit complicated, but once you know how to do this it is very simple and saves **a lot** of time. Ask for a demonstration if in doubt.

ARCHIVING DIGITAL DATA

Introduction

Gwynedd Archaeological Trust is not an archiving organisation and digital archiving in particular cannot be done adequately within the Trust as this requires secure computer systems and active curation to maintain data despite changes in formats and the risk of degradation.

The Royal Commission for Wales has joined with the Scottish Royal Commission to provide a secure, active archiving facility for digital data. At the moment this service (unlike that provided by the Archaeological Data Service (ADS) is completely free and it is important that we make use of it. It has the additional advantage that photographs and reports can be made accessible to the public through the RCAHMW's Coflein website.

GAT therefore has an in-house archiving system for holding information for Trust use but all important data should be properly archived for long term storage by RCAHMW or potentially in future by ADS.

The following gives guidance on both elements.

In-house archiving

HER
One of the main products of any project is information to up-date the Historic Environment Record (HER). The project should be set up so that PRNs are obtained and included in reports (all reports, not just assessments) and that reports are written to HER standards. Including the data into the HER is both a type of archiving and a means of dissemination. A rapidly updated HER aids work on both Cadw and commercial projects.

PRNs are to be obtained from the HER (Angharad) for any new sites identified during a project (note down what PRNs are used for which projects on P:\Project Management\PRN Allocation\PRN allocations.accdb). This may negate the use of feature numbers within a project report. All reports should include PRNs and be written to HER standards.

To enable the easy and quick input of sites into the HER create a database for all sites including the following as a minimum:

Project no
PRN
Site name
Broadclass
Site type
Period
NGR
Form
Description
Unitary Authority
Community Council
1:10K map sheet
Easting
Northing

A database that can be used as a template can be found at P:\Project Management\Templates\Sites to input into HER database\Sites to input into HER database template.mdb

In Shared\Archived Projects on Shared create a folder for your project. Copy into that the 'sites to be input into the HER' database and a copy of the complete and final report in PDF format (reduce the size of the report by printing as a PDF and setting the print quality to 300dpi). We are aiming to produce PDFA reports but guidance for this is still being worked on. Also include a Word copy of the final text. For both versions of the report make sure cost information has been removed.

For commercial projects the report should not be put onto the Shared drive until the client has agreed that the report can be released to the HER as the Shared drive is essentially open to public access and is part of the HER.

Other in-house archiving: where to put things and when
When you complete a project or a distinct stage of a project (i.e. the assessment phase) the digital archive needs to be collected together and placed in the Archive folder within the Project folder on the P drive. The photographs should already be on the U-drive. The digital archive should include any complete surveys, databases and other digital data worth archiving. Add the filenames and details of all these to your metadata/photo register database for the project but that database should stay on the U-drive with the photographs.

When the report is ready to be released into the public domain give a paper copy to the HER and place a PDF of the full report and a copy of the text in Shared\Archived Projects on Shared (as above). Don't put any illustrations not incorporated into a report or any other odd bits and pieces in the Archived Projects folder.

Make sure this includes your 'sites to be input into the HER' database as well as the report. Inform HER that the database and report is there and that the information can be released to the HER.

When all stages of a project are completely finished the digital archive can be sent to the RCAHMW. If different stages of a project have different project codes they can be treated separately (e.g. an assessment has a different code to an excavation following it), but if all the work is done under a single code wait until the whole project is finished before sending off the archive as below.

Archived Projects on P
Once the Archive folder has been checked and all appropriate files have been added the completed project folder should be moved to the "Archived Projects on P" folder. Check through the folder and delete any duplicate files or working files that are not required now the report is complete. Before deleting any images check that all images are embedded in report illustrations. If you don't know how to do this or what it means then ask John. It is useful to have versions of illustrations with full layer structure in case they are needed for future projects. So if you have reduced your illustrations for inclusion in the report keep the full versions.

In particular no photographs that should be on the U drive should be left in the folder. Any bulk copies of photos from the U drive should be deleted, once any links to illustrations have been checked. It is recommended that photographs are not bulk copied in this way into project folders to start with.

Make sure that all files are in the correct place in the folder structure so that they can be easily located in future.

Long term digital archiving
Our digital data is currently being actively curated through RCAHMW and needs to be sent off once a project is finished and can be released into the public domain. Sending a PDF of a report fulfills our obligation to lodge a copy of reports with the Royal Commission.

Consider what data is worth long term archiving. Include full site surveys, databases and copies of reports, as well as photographs.

Surveys should be in DWG format. Databases in Access format as .MDB files and reports as PDFs. For excavations scanned field drawings may be worth archiving.

Some files such as project design and database for HER input may be copied into the Archive Projects folder at allow access by others but should not be included in the data finally sent for long term archiving.

All digital data requires metadata. Add any files to be archived to your metadata/photo register database. Give full filename with ending and a description of what the file includes and its function.

It is important in both digital and paper records to make sure your records can be understood in future by someone who knows nothing about the site. Is the site code clearly indicated on all records? For AutoCAD surveys include a description of the layers used and any notes necessary to understand and use the survey. For databases, especially specialist ones where codes have been used as short-hand for characteristics of artefacts ensure there is a key describing those codes. Preferably include this within the database as a small table. For all other material make sure it is clear what it is, how it should be used and why it has been kept.

Contact Gareth Edwards at RCAHMW to let him know how much material you will be sending through.

Contact details: Gareth Edwards (Information Manager, RCAHMW)
E-mail: gareth.edwards@rcahmw.org.uk
Telephone: 01970 621223
Address: Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW),
Plas Crug,
Aberystwyth,
Ceredigion
SY23 1NJ

Copy all the digital archive from both the Archive Projects folder and from the U-drive on to CDs, and post to Gareth. Check with him that everything has copied alright, works and can be managed by him. **Beware** – Gareth will put the photographs on the Coflein website as well as the reports. Make sure no embarrassing photos get included in the archive.

Photos
Photos should be sent to RCAHMW in TIFF format for archiving. Converting RAW files to TIFFs for storage on the GAT computers would take up too much space so files should be converted immediately before saving the data to a CD or USB drive to send to RCAHMW. The TIFF versions should be deleted from all GAT computers as soon as the CDs have been produced. If you leave the TIFFs on the computer overnight they will get saved to the Backup and will start clogging that up. If the TIFFs need to be stored for a short time put them on the portable hard drive that is available either from Andrew or Jane.

Use ViewNX2 to batch convert NEF files to TIFFs (See above for how, just change the file format).

Remember that your photo record database will need altering if all the filenames have JPEG endings, so that they have TIFF endings when the database is sent off.

On small evaluations and watching briefs where photographs include nothing of lasting archaeological value it has been decided that full archiving is not necessary. These will be kept on the U drive and not sent for long term archiving.

KEEPING TRACK OF PROJECTS

Many projects can run for years and are worked on by several people so it is important to know what has been done and when. There is now a **project database** that is used to track projects. When you complete a significant stage in a project, e.g. send off a draft copy of a report to DC, send off the finished report, archive material, please note this in the database to be found at P:\Project Management\Project Database\MAIN PROJECT DATABASE.mdb.

This is for use by everyone running projects, both contract and Cadw projects. If nothing else fill in the boxes showing what has happened to the report and archive.

To keep track of archiving use the archive database \\192.168.0.201\shared\Archiving\DATABASES\ARCHIVING DATABASE.mdb. Especially where

digital archives are sent away please keep a note of what has been sent, when and by who in the “Final Archiving” table.

APPENDIX II

Gwynedd Archaeological Trust Context Register

Context Number	Type	Filled By	Fill Of	Description
001	Layer	-	-	Topsoil overlying playing areas.
002	Subsoil	-	-	Soil below the topsoil overlying the moat deposits, re-deposited soils.
003	Layer	-	-	Natural layer of silty sand containing frequent stone.
004	Cut	005-011 inc.	-	Outer cut for the castle moat, at the eastern side of the castle.
005	Fill	-	004	Sandy clay layer.
006	Fill	-	004	River gravel mixed with sand.
007	Fill	-	004	Dark grey silt layer.
008	Fill	-	004	Very dark grey/black layer of silt containing shell.
009	Fill	-	004	Sandy silt layer.
010	Fill	-	004	Grey silt layer.
011	Fill	-	004	Light bluish grey clay layer.
012	Cut and Fill	-	-	Cut and fill of modern drain.

APPENDIX III

Gwynedd Archaeological Trust Artefacts Register

Finds Number	Context No	Material	Description
001	(002)	Pottery	1x large sherd of Post-Medieval pottery (circa. 17-18th cent).
002	(002)	Pottery	1x medium sized sherd of Post-Medieval pottery. Possibly Buckley. Inner and outer glazed.
003	(002)	Pottery	1x medium sized sherd of Post-Medieval pottery (circa. 17-18th cent). Glazed on inner side and black in colour.
004	(002)	Pottery	1x medium sized sherd of Post-Medieval pottery (circa. 17-18th cent). Glazed and brown in colour.
005	(002)	Pottery	1x medium sherd of Post-Medieval pottery (circa. 17-18th cent). Outer glazed and dark brown in colour.
006	(002)	Pottery	1x medium sized sherd of Post-Medieval decorated pottery. Possibly a bowl or a plate. Glazed on surface and medium brown in colour

APPENDIX IV

Gwynedd Archaeological Trust Digital Photographic Record Register

File reference	Project name	Project phase	Description	View from	Scale (s)	Type	Date
G2347_001	G2347 Beaumaris Flood Alleviation Scheme	Evaluation	Pre-ex location shot	SW	-	Photograph	06/10/15
G2347_002	G2347 Beaumaris Flood Alleviation Scheme	Evaluation	Pre-ex location shot	ENE	-	Photograph	06/10/15
G2347_003	G2347 Beaumaris Flood Alleviation Scheme	Evaluation	Working shot	ENE	-	Photograph	06/10/15
G2347_004	G2347 Beaumaris Flood Alleviation Scheme	Evaluation	Working shot	SSE	-	Photograph	06/10/15
G2347_005	G2347 Beaumaris Flood Alleviation Scheme	Evaluation	Working shot showing existing 1050 pipe	ESE	-	Photograph	06/10/15
G2347_006	G2347 Beaumaris Flood Alleviation Scheme	Evaluation	Working shot showing existing 1050 pipe	SE	-	Photograph	06/10/15
G2347_007	G2347 Beaumaris Flood Alleviation Scheme	Evaluation	North facing section of evaluation trench	N	2x1m	Photograph	07/10/15
G2347_008	G2347 Beaumaris Flood Alleviation Scheme	Evaluation	North facing section of evaluation trench - western end	N	2x1m	Photograph	07/10/15
G2347_009	G2347 Beaumaris Flood Alleviation Scheme	Evaluation	North facing section of evaluation trench - central area	N	2x1m	Photograph	07/10/15
G2347_010	G2347 Beaumaris Flood Alleviation Scheme	Evaluation	North facing section of evaluation trench - eastern end	N	2x1m	Photograph	07/10/15
G2347_011	G2347 Beaumaris Flood Alleviation Scheme	Evaluation	Post-ex shot of evaluation trench	E	2x1m	Photograph	07/10/15
G2347_012	G2347 Beaumaris Flood Alleviation Scheme	Evaluation	Post-ex shot of evaluation trench	W	2x1m	Photograph	07/10/15
G2347_013	G2347 Beaumaris Flood Alleviation Scheme	Evaluation	Profile of eastern edge of moat	NNE	1x1m	Photograph	07/10/15
G2347_014	G2347 Beaumaris Flood Alleviation Scheme	Evaluation	End section of trench	NNW	1x1m	Photograph	09/10/15
G2347_015	G2347 Beaumaris Flood Alleviation Scheme	Evaluation	End section of trench	SSE	1x1m	Photograph	09/10/15
G2347_016	G2347 Beaumaris Flood Alleviation Scheme	Evaluation	End section of trench - south end	WSW	1x1m	Photograph	09/10/15
G2347_017	G2347 Beaumaris Flood Alleviation Scheme	Evaluation	End section of trench - north end	WSW	1x1m	Photograph	09/10/15
G2347_018	G2347 Beaumaris Flood Alleviation Scheme	Evaluation	General post-ex shot	W	-	Photograph	09/10/15
G2347_019	G2347 Beaumaris Flood Alleviation Scheme	Evaluation	General post-ex shot	ENE	-	Photograph	09/10/15

APPENDIX V

Gwynedd Archaeological Trust Site Matrix

Site Matrix

(001)	Top soil.
(002)	Sub soil layer with inclusions of pottery.
(012)	Modern drain pipe.
(011)	Bluish grey clay moat fill
(010)	Grey silt moat fill
(009)	Sandy silt moat fill
(005)	Sandy clay moat fill
(007)	Dark grey silt moat fill
(006)	Silted sand and gravel mixed moat fill
(008)	Black marine silt moat fill. Presence of sea shells found in this layer
[004]	Cut of moat
(003)	Natural

APPENDIX VI

Environmental Archaeology Consultancy Report

Beaumaris Castle Moat
Auger Survey and sediment sampling

The evaluation trench through the eastern moat at Beaumaris Castle did not bottom (Fig. 1) the moat so an auger survey was conducted along the floor of the evaluation trench to establish the full depth of the moat sediments. In addition to the auger survey it was decided to take a core sample through the moat silts at the deepest (west) end (Fig. 2) and a bulk sample from the basal 20cm of the moat for potential macrofossil study.

The auger points were laid out at 0.5m intervals using a hand tape and subsequently surveyed using a GPS. A total of eight boreholes were laid across the five metre floor of the trench. The deposits were augered using a 20mm diameter, one metre long gouge auger. The deposits were logged in the field. The site overlies diamicton of Devensian Age (http://mapapps.bgs.ac.uk/geologyofbritain/home.html?) so the glacial clays that floor the moat were easily recognised from the silts infilling it.

Fig. 1. The evaluation trench in the moat looking west towards Beaumaris Castle.

As part of the fieldwork a core sample was taken at the west end of the evaluation trench through the thickest moat deposits (Fig. 2) from the base of the backfilling deposits to the floor of the moat. This was taken in two overlapping 110mm diameter plastic earth pipes whose ends were sealed to prevent the core drying out. Additionally a bulk soil sample was taken from the basal 0.2m of the moat silts beneath the section near the west end of the trench just in front of Core 2 in Fig. 2.

The core sample was split, cleaned, photographed and described (Fig. 4). A series of pollen sub-samples were taken from the cleaned surface at 4cm intervals and are now stored in a fridge to prevent deterioration. The cores were wrapped in clingfilm and stored. A small one litre sub-sample of the bulk sample was processed over a 250 micron mesh sieve and the retained organic and mineral fractions scanned for macrofossils remains.

Results

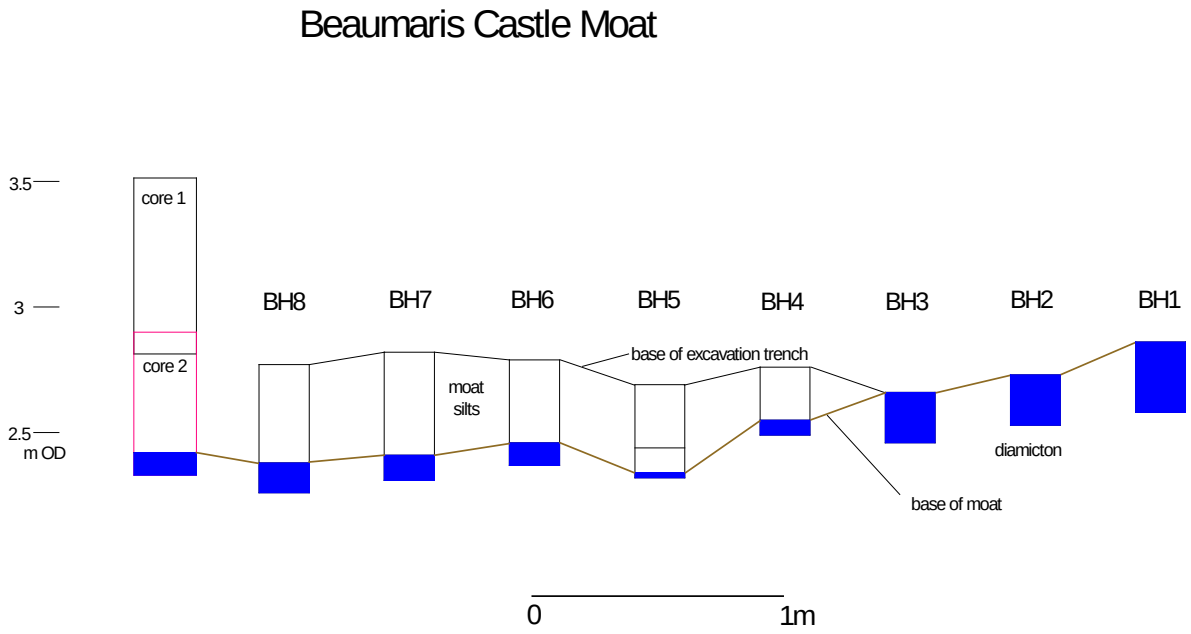
The remaining moats silts in the floor of the trench turned out to be quite shallow (Fig. 3). The deposits in boreholes BH1, BH2 and BH3 at the east end of the trench were all diamicton or disturbed diamicton (glacial till), the deposits that underlie and formed the floor of the moat. The maximum depth of silts on the floor of the excavation trench was 0.41m in BH7 and boreholes BH5 to BH8 and the core sample indicate a broadly flat moat floor at between 2.34 and 2.46m OD (Fig. 3). The variations in level evident in Fig. 3 on the floor of the moat probably reflect the uneven surface produced by hand digging.

Fig. 2. The two cores driven in to sample the moat silts. The upper 'fill' deposits were excluded.

The fills of the moat largely comprise fine grained slightly organic silts with some visible organic fragments and occasional small twigs and small roundwood. Occasional large pebbles indicate debris probably thrown in. The deposits are unoxidised in the lower 0.7-0.8m of the moat silts and the evidence for banding (Fig. 4) suggests episodes of sedimentation perhaps indicating periods of silt deposition from terrestrial (the stream valley to the north) and marine sources. The upper unsampled part of the moat deposits are silts

disturbed by soil processes, probably backfill and also disturbance and backfill associated with the earlier water pipe due for replacement (debris immediately behind Core 1 in Fig. 1).

Fig. 3. Diagramatic Section of the moat deposits and floor in the base of the evaluation trench



The one litre sub-sample produced a range of debris including plant detritus, moss, seeds, insect fragments, shells and fish bone. A brief scan of these finds indicate a marine element including tellens, probably *Scorbicularia plana* a bivalve common in saltmarsh channels and estuaries, foraminifera, cockle shell fragments, *Hydrobia ulvae* a species of estuaries and saltmarsh. Other unspecific aquatic elements include fish bones and ostracods, while freshwater conditions are suggested by the presence of midge larval heads (Chironomidae).

With the base of the moat at 2.34m OD and a modern tidal range of over 6m the moat would have been tidal if connected to the sea. The marine elements in the bulk sample certainly suggest this and previous work on the ostracods (Kontrovitz and Henry 2004) proposed basal sediments (2.6-2.15m depth) of fresh to slightly brackish water followed by brackish or marine at 2.15 to 1.3m depth suggesting a connection with the Menai Straits, with the upper sediments reduced in salinity suggesting disconnection from the Straits. Given that the building of the castle was begun in the 1290's and digging of the moat was still underway in 1312-1315 AD (Smith pers comm.) there must have been a period (during its construction) when it was not connected to the sea but almost certainly periodically flooded (as a result of precipitation), which could in part account for a freshwater to slightly brackish element in the basal fills, although perhaps not as much as half a metre.

Conclusions

The moat has an essentially flat bottom at between 2.34 and 2.46m OD. There is a 0.7-0.8m depth of unoxidised silts in the base of the moat, a further 0.3-0.4m of undisturbed silts above this, with the latter capped by friable (earthworm worked) disturbed silts and later backfill deposits that must have dried out seasonally in the past. These latter deposits have very limited potential but the 1.1m of undisturbed silts below will contain a sequence reflecting the changing saline and freshwater conditions in the moat and a picture of the local environment around the castle.

0-4cm empty through compression

4-16 dark brown (&.5YR 3/2) very slightly sandy organic silt – friable

—

16-34 very dark greyish brown (10YR 3/2) slightly organic silt – wood/twig at 32cm

—

34-49 very dark greyish brown (10YR 3/2) silt – less organic than above

—

49-57 very dark grey and very dark greyish brown (10YR 3/1 and 3/2) mixed colour silts and organic silts – top of unoxidised deposits

—

57-70 very dark grey and very dark greyish brown (10YR 3/1 and 3/2) fine organic silt with occasional visible organics/wood fragments

—

70-88 black fine organic silt

—

88-94 very dark grey (10YR 3/1) fine organic silt

94-101 black (10YR 2/1) organic silt with fine sand

101-117 black (10YR 2/1) organic silt

117-118 dark grey (10YR 4/1) sandy silty clay –base of moat

118-127 greyish brown (10YR 5/2) sandy clay – diamicton

Fig. 4. Cleaned cores through the moat silts

The survival of shells, ostracods, foraminifera, insect, plant macrofossils and almost certainly pollen afford the opportunity to address in detail the environmental changes in the moat and surrounding area during the period the sediments formed. Elements of the organic remains would allow the opportunity to radiocarbon date the different levels to give a chronology to any changes. With biological and historical evidence (Smith pers. comm.) for a connection with the Menai Straits it would be of interest to establish whether this was present when the castle was first constructed in the late 13th and early 14th century, or was later added when the castle had other roles, and also when it was finally disconnected. If the latter occurred post 1600 AD then it is likely that the radiocarbon dates will not be able to tie this down with any accuracy or confidence owing to the shape of the calibration curve during this period.

The core should afford sufficient material for the analysis of most of the biological elements should this be pursued, while the bulk sample from the basal levels will give a much larger assemblage of material from the primary deposits associated with the early use of the castle.

We have few pollen sequences from medieval deposits closely associated with settlements, and although we traditionally view this period as lacking any major changes, recent work is showing continued woodland clearance, expanding arable, the arrival of crops such as hemp and rye, and early plantations, all of which contribute to our broader understanding of the landscape during this period.

Acknowledgements
I should like to thank Spencer Smith and Mike Lynes for their assistance on site and the supply of the survey data and information on the construction period of the castle. The cores were split, cleaned and photographed and the sub-sample processed by Trude Maynard of the Environmental Archaeology Consultancy.

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Environmental Archaeology Consultancy

14th December 2015

Appendix - Borehole logs

BH1	
0-28cm	yellowish brown (10YR 5/4) pebbly slightly clayey sands with some iron staining – moat floor (disturbed diamicton)
BH2	
0-20cm	pebbly sandy clay – moat floor (diamicton)
BH3	
0-20cm	pebbly sandy clay – moat floor (diamicton)
BH4	
0-21cm	black (10YR 2/1) very fine humified organic silt- top 4cms slightly sandy with occasional pebbles
21-27	sticky slightly stoney clayey sand – moat floor (disturbed diamicton)
BH5	
0-25cm	black (10YR 2/1) and very dark grey (10YR 3/1) slightly sandy organic silt
25-35	very dark grey (10YR 3/1) very dark grey slightly organic fine silt
35-37	sharp boundary above – brown (10YR 5/3) stoney clayey sands (disturbed diamicton)
BH6	
0-33cm	very dark grey (10YR 3/1) slightly banded fine organic silts with visible organics, with paler bands of dark grey (10YR 4/1)
33-42	brown (10YR 5/3) slightly stoney sandy clay (diamicton)
BH7	
0-41cm	banded black (10YR 2/1) and very dark grey (10YR 3/1) fine organic silts with visible organics and bands of dark grey (10YR 4/1) silts. Visible organics including small twigs
41-51	brown (10YR 5/3) stoney sandy clay (diamicton)
BH8	
0-40cm	banded black and very dark grey (10YR 2/1 and 3/1) fine organic silts with paler patches and visible organics – sharp boundary below
40-51	slightly stoney and gritty sandy clay (diamicton)

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