Report for Archaeological Monitoing at

WEST SHORE OUTFALL LLANDUDNO

For Dwr Cyrmu

Matthew Jones

L-P:ARCHÆOLOGY

Report for Archaeological Monitoing at

WEST SHORE OUTFALL LLANDUDNO

| Client: | Dwr Cyrmu |
|------------------|------------------------------|
| Local Authority: | Conwy County Borough Council |
| NGR: | (SH) 276200 382300 |
| Planning App: | GC6674 WG Marine Consent |
| Author(s): | M Jones |
| Doc Ref: | LP1518C-AWB-v1.2 |
| Date: | September 13 |

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Abstract

This report details the results of an Archaeological Watching Brief conducted by L - P: Archaeology on behalf of Dwr Cymru.

These works entailed the monitoring of machine excavation associated with the repair of the *W*est Shore outflow pipe in Llandudno.

Monitoring was undertaken by Matthew Jones between 2nd and 26th April 2013 and was carried out in accordance with a written scheme of investigation agreed by Gwynedd Archaeological Planning Service.

No archaeological remains were uncovered during the aforementioned works.

1. Introduction

- 1.1.This report details the results of the final phase of a programme of works carried out by Dwr Cymru in relation to the repair of an existing 700m diameter outflow pipe at West Shore, Llandudno. A desk based study was conducted in 2012 by Jonathan Shipley of AECOM, which identified a number of Medieval features in the vicinity of the pipe and highlighted possible archaeological implications of the proposed works. As such Gwynedd Archaeological Planning Service (GAPS) requested that a watching brief be carried out during groundworks.
- 1.2. The site is located off shore at national grid reference SH 762 383 off the West Shore of Llandudno (FIGURE 1), where known Medieval fish weirs are situated.
- **1.3.**This archaeological results document has been prepared by Matthew Jones of L P: Archaeology on behalf of Dwr Cymru.
- 1.4.The Local Authority is Conwy County borough Council, who take archaeological advice from GAPS. Works were carried out under a marine licence (GC6674) granted on 1st March 2013.
- 1.5.A scheme of works was agreed with GAPS prior to the commencement of site works and was supplied to Costain, the main contractor on-site. All excavation works to the pipeline were carried out under the archaeological supervision of Matthew Jones between 2nd April and 26th April 2013.
- **1.6.**No features or artefacts of archaeological interest were uncovered during the works and the possible Medieval features were not located within the impacted areas immediately adjacent to the pipeline.
- 1.7.L P : Archaeology have allotted an internal site code of LDN/WSO 13 for this site.

2. Planning Background

- **2.1.**Planning Policy Wales, 4th edition (2011) and the associated Welsh Office Circulars 60/96 and 61/96 provides guidance for planning authorities, property owners, developers and others on the preservation and investigation of archaeological remains within a planning context. These documents supplement the Adopted Unitary Development Plan Policies relating to archaeology.
- 2.2.Planning Policy Wales (2011) outlines the Welsh Assembly's planning policies. The historic environment is discussed within Chapter 6. Welsh Office Circulars 60/96 Planning and Historic Environment: Archaeology, and Welsh Office Circular 61/96 Planning and the Historic Environment; Historic Buildings and Conservation Areas, advise on legislation and procedures relating to historic buildings, conservation areas and archaeology.
- **2.3.**In considering any planning application for development the local planning authority, Conwy County Borough Council, is bound by the policies within the Conwy Local Development Plan, revised in 2011.
- 2.4.Relevant policies include;
 - ♦ CTH/1 Cultural Heritage
 - ♦ CTH/2 Development Affecting Heritage Assets
 - ♦ CTH/3 Buildings and Structures of Local Importance
- **2.5.**As works were carried out off shore a marine license (GC6674) was granted by the Marine Consents Unit in advance of works.

3. Geology & Topography

- 3.1.The 1:50,000 scale geology map of the area shows the bedrock as comprising of Lower Palaeozoic Rocks (Undifferentiated) Mudstone. Sedimentary Bedrock formed approximately 417 to 545 million years ago in the Silurian and Cambrian Periods. The drift deposits are represented by marine silts.
- **3.2.** The site is located on the western section of the Great Orme peninsula (FIGURE 1).
- **3.3.**It is low-lying shore environment of flat beaches and sand dunes. The shore line area has been developed with a promenade and shore defences.
- **3.4.**The site area can be divided into two distinct areas, Area 1 where the compound was established at the site of the old Gogarth Hotel, and Area 2 following the alignment of the existing pipeline (FIGURES 2 & 3).

4. Archaeological & Historic Background

4.1. An extensive historic survey of the area was compiled by Jonathan Shipley (2012) and formed the Desk Based Assessment phase of works. It was not felt necessary to duplicate this work and as such a summary of the original work has been included below.

4.2.PREHISTORIC (TO AD 43)

4.2.1. There is significant evidence for prehistoric activity surrounding the study area from the Palaeolithic period through to the Bronze Age from sites on the Great Orme, Pen-y-Ffridd, Corlan Gras Parand Penmorfa. A prehistoric stone axe was recovered from the high water mark in the area of the existing outfall pipe. However, this appears to have been deposited as a result of coastal erosion rather than representing an in situ find.

4.3.ROMAN (AD 43 TO 450)

4.3.1. The Roman period is represented mainly by a collection of finds recovered from the Penmorfa Adit in the eastern part of the study area. These include a coin, pottery, and a proposed Roman causeway

4.4.EARLY MEDIEVAL (AD 450 TO 1066)

4.4.1. The Early Medieval period is represented in the wider area, although there is no evidence for Early Medieval activity within the study area.

4.5.MEDIEVAL (AD 1066 TO 1500)

- **4.5.1.** Within the site area a total of eleven Medieval sites have been identified. Gogarth Grange gardens and the scheduled remains of the Gogarth Abbey which date from the 13th century occupy the area designated for the site compound.
- **4.5.2.** Field systems show Medieval agriculture was present in the surrounding area. In addition to the agricultural remains evidence for fish weirs or fish traps have been recorded on the foreshore area, two of which are located on the line of the outfall pipe, while a third lies slightly further south east near the new breakwater. The importance of the fish weir can be seen from details recorded

from as early as the 13th century when two weirs in the area, named Gorad Maelgwn and Gorad Wyddno, were reported to be worth 40 shillings a year in 1284. Fish traps along the Welsh coast follow two general forms; the first being a simple fence and the second a 'v-shaped' fence which runs into the river or river channel into which woven baskets are placed to catch the fish.

- **4.5.3.** Although difficult to date due to a continuation of use until the 19th century, the documentary evidence suggests an early date for the fish weirs in the study area, while dating of timbers from one of the weirs on the line of the outfall has dated it to 1460.
- **4.5.4.** The fish weirs were examined as part of a thematic study undertaken in 2000. Both sites were visible at the time of survey in 1999, although no evidence of them was seen during the walkover survey as part of this assessment. This may be due to the construction of a breakwater in the intervening period.

4.6.POST MEDIEVAL (AD 1500 TO 1899)

- **4.6.1.** The importance of farming and fishing continued into the Post Medieval period with the copper mining not taking a big role in the economy until the late 17th century.
- **4.6.2.** The site area along the pipeline is thought to have continued as a fishing area during the Post Medieval period.

4.7.MODERN (AD 1900 TO PRESENT)

4.7.1. Problems caused by flooding at West Shore were finally tackled at the closing years of the 20th century when a new breakwater was constructed in the southern half of the study area a short distance from the outfall pipe. This feature appears to have cut into one of the fish traps reported in the area.

5. Aims & Methodology

5.1.AIMS

- 5.1.1. The aims of the archaeological works were:
 - to establish the archaeological date, character and nature of any deposits or features present
 - to fully record any archaeological features or deposits encountered during groundworks
 - to ensure that no undue harm comes to the archaeological features present

5.2.METHODOLOGY

- **5.2.1.** The groundworks were undertaken using an appropriate plant as agreed with GAPS. The plant used during works was a JCB3CX with toothless ditching bucket. This machine was used to remove deposits deemed to be archaeologically neutral.
- **5.2.2.** A suitably qualified and experienced archaeologist monitored all excavation activities to ensure that appropriate care was taken during the removal of all deposits.
- **5.2.3.** Undifferentiated silting and overburden of recent origin was removed in successive spits down to the top of the first significant archaeological horizon.
- **5.2.4.** Where work was carried out in low light environment, artificial lighting was engaged to allow for adequate visibility.
- 5.2.5. The site code LDN/WSO 13 has been allocated by L P : Archaeology. This code was used to label all sheets, plans and other drawings; all context and recording sheets; all photographs (but not negatives); all other elements of the documentary archive.
- 5.2.6. The recording system used follows the Museum of London Archaeological Site Manual. Context sheets include all relevant stratigraphic relationships.

6. Results

- **6.1.**Due to the fragmentary nature of the works, both geographically and temporally, the following results section has been written in the form of a site diary with locations given as chainage measurements based on the contractors site plan (FIGURE 3).
- 6.2. The Archaeological Watching Brief was conducted by Matthew Jones on behalf of L P : Archaeology at West Shore, Llandudno. The works were carried out at two areas (FIGURES 2 & 3). The first involved the stripping of a garden area within the Old Gogarth Hotel. This area was being utilised to create a compound and storage area. The second excavation site was a linear set of works at predetermined points along the main foul and waste water outflow pipe for West Shore.
- **6.3.** A schedule of works was supplied by the contractor which indicated the points where an archaeological presence would be needed on site.

6.4.Timetable

6.4.1. The works were undertaken on the following dates 02/04/2013, 03/04/2013, 08/04/2013, 09/04/2013, 23/04/2013, 24/04/2013 & 26/04/2013.

6.5.Results

Area 1 – Old Gogarth Hotel (02/04/2013 to 03/04/2013)

- **6.5.1.** The watching brief carried out at the Old Gogarth Hotel gardens involved the removal of the top soil and partial removal of the subsoil to an overall depth between 0.32m 0.45m (FIGURE 2).
- **6.5.2.** Two contexts were identified within this excavation area. Context (01) was a loose brown sandy clay as part of the turf soil matrix and context (02) was a lower light brown silty clay subsoil.
- **6.5.3.** The area has been heavily disturbed by years of cultivation and the demolition of the hotel. All artefactual material recovered was either late 19th century or early 20th century in date and the ceramics were mainly household wares with the occasional plant pot.
- **6.5.4.** No archaeological features were identified within this area.

Area 2 – Linear Watching Brief (08/04/13 – 26/04/13)

Dates - 08/04/13

6.5.5. Excavation work was carried out at approximately chainage 1000 (FIGURE 3). Although there was heavy flooding two contexts were identified. Context (101) was beach sand of between 0.28 and 0.37m in depth and context (102) was a darker organic sand recorded to a depth of 0.31m, however the base of deposit was not reached.



Plate 1 - Repair to pipe at chainage 1000

6.5.6. All spoil was checked visually and with a metal detector to aid artefact recovery. No archaeological features or artefacts were identified.



Plate 2 - Upcast spoil, 1m scale.

Dates - 09/04/13

6.5.7. Excavation was carried out around the 800's chainage, with excavation carried out at either side of the pipe. The same context sequence was recorded as above. All spoil was checked visually and with a metal detector to aid artefact recovery, no archaeological features or artefacts where identified.



Plate 3 - Excavation around pipe at chainage 800

Dates - 23/04/13 to 26/04/13

- **6.5.8.** A watching brief was conducted on the placement of metal piles. These where being placed in areas that had already been excavated under archaeological observation so did not yield any new information.
- **6.5.9.** Work was also carried out at the location of the diffuser head. No archaeological features or artefacts were identified.

7. Summary & Conclusion

- **7.1.**Repair and replacement works were carried out by Dwr Cymru along an existing 700m diameter outflow pipe at West Shore, Llandudno. This document contains the results of the archaeological watching brief carried out at the site as requested by Gwynedd Archaeological Planning Service (GAPS).
- **7.2.**The site is located off shore at national grid reference SH 762 383 off the West Shore of Llandudno.
- **7.3.**The fieldwork and this document were undertaken by Matthew Jones of L P: Archaeology on behalf of Dwr Cymru.
- 7.4. Within the Gogarth Hotel Gardens area a total of two contexts were identified during the excavation. A loose brown sandy clay below the turf and a lower light brown silty clay subsoil. The area had been heavily disturbed by years of cultivation and the demolition of the hotel. All artefactual material recovered was either late 19th century or early 20th century in date and the ceramics were mainly household wares with the occasional plant pot. No archaeological features were identified within this area.
- **7.5.**Along the linear pipeline works another two contexts were identified. The upper deposit was a beach sand of between, which overlay a darker organic sand. All spoil was checked visually and with a metal detector to aid artefact recovery. No archaeological features or artefacts were identified during the works around the pipeline.

SOURCES CONSULTED

STANDARDS & GUIDANCE

- POOLE B 2012. Specification for Archaeological Monitoring at West Shore, Llandudno, unpublished archive report for L P: Archaeology
- SHIPLEY J 2012. Archaeological Desk Based Assessment of West Shore Outfall, Llandudno, unpublished archive report for Aecom

FIGURES







WRITTEN SCHEME OF INVESTIGATION APPENDIX 1

Specification for Archaeological Monitoing at

WEST SHORE OUTFALL LLANDUDNO

For Dwr Cyrmu

Blair Poole MSc MIfA

L-P:ARCHÆOLOGY

Specification for Archaeological Monitoing at

WEST SHORE OUTFALL LLANDUDNO

| Client: | Dwr Cyrmu |
|------------------|------------------------------|
| Local Authority: | Conwy County Borough Council |
| NGR: | (SH) 276200 382300 |
| Planning App: | N/A |
| Author(s): | B Poole |
| Doc Ref: | LPI5I8C-SWB-vI.5 |
| Date: | March 13 |

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Figure 2 - Site Location Detail

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Appendix I – Additional Information

1. Introduction

- 1.1.Dwr Cymru have identified a need to repair an existing 700mm diameter outfall pipe at West Shore, Llandudno. The works will entail cleaning of the pipe, replacing a missing section of pipe, severing the link with an adjacent 500mm diameter pipe and repair to areas of the existing pipe.
- 1.2. The site is located off shore at national grid reference SH 762 383 at the West Shore of Llandudno (FIGURE 1), where known Medieval fish weirs are situated.
- **1.3.**Gwynedd Archaeological Planning Service (GAPS) have requested that Dwr Cymru appoint an archaeological contractor to carry out archaeological monitoring during groundworks associated with enabling works for a site compound and repair works to the pipeline.
- 1.4.This project design has been prepared by Blair Poole of L P : Archaeology on behalf of Dwr Cymru in response to GAPS request.
- **1.5.**The Local Authority is Conwy County Borough Council, who take archaeological advice from GAPS, who will continue to monitor works at the site to ensure the correct standards and practices are adhered to.
- 1.6.L P : Archaeology have allotted an internal site code of LDN/WSO 13 for this site.
- 1.7. The project will be directed by Blair Poole of L P: Archaeology. Site work will be undertaken by Matthew Jones.
- **1.8.** All site staff will undergo full site induction upon arriving for any relevant site visit, and all relevant health and safety procedures will be adhered to at all times.

2. Planning Background

- 2.1.Planning Policy Wales, 4th edition (2011) and the associated Welsh Office Circulars 60/96 and 61/96 provides guidance for planning authorities, property owners, developers and others on the preservation and investigation of archaeological remains within a planning context. These documents supplement the Adopted Unitary Development Plan Policies relating to archaeology.
- 2.2.Planning Policy Wales (2011) outlines the Welsh Assembly's planning policies. The historic environment is discussed within Chapter 6. Welsh Office Circulars 60/96 Planning and Historic Environment: Archaeology, and Welsh Office Circular 61/96 Planning and the Historic Environment; Historic Buildings and Conservation Areas, advise on legislation and procedures relating to historic buildings, conservation areas and archaeology.
- **2.3.**In considering any planning application for development the local planning authority, Conwy County Borough Council, is bound by the policies within the Conwy Local Development Plan, revised in 2011.
- 2.4.Relevant policies include;
 - ♦ CTH/1 Cultural Heritage
 - ♦ CTH/2 Development Affecting Heritage Assets
 - ♦ CTH/3 Buildings and Structures of Local Importance

2.5.A marine licence has been granted to carry out the repair works off shore.

2.6.SITE BACKGROUND (AFTER SHIPLEY 2012)

- 2.6.1. The following section is intended as a brief background taken from a Desk Based Assessment carried out on the site by AECOM, on behalf of Dwr Cymru. This is not intended as a detailed historic background, more an indication of the presence of heritage assets in the vicinity.
- **2.6.2.** Prehistoric activity has been identified within a 500m radius of the site, comprising finds from the Palaeolithic onwards. These are centred on the Great Orme, to the north of the site and include individual finds, middens, and hut platforms.

- **2.6.3.** A stone axe was found in the immediate location of the existing outfall pipe and as such finds and features of this period may be uncovered during groundworks.
- **2.6.4.** Evidence of Roman activity is limited in the immediate area. Three sites have been identified to the east of the site in an area where a possible Roman causeway and mining settlement has been suggested.
- **2.6.5.** There is no direct evidence for Early Medieval activity in the immediate vicinity, however the wider area is thought to have been exploited during this period.
- **2.6.6.** There is a great deal of evidence for settlement in the vicinity during the Medieval period, with activity at Gogarth Grange gardens, Gogarth Abbey and evidence of associated land management and agricultural activity. Gogarth appears to be the main point of settlement activity from this period.
- **2.6.7.** Of note are a series of Medieval fish weirs and traps that lie within the site area and are thought to be impacted by the works.
- 2.6.8. Development of the area continued into the Post Medieval period and the majority of the heritage assets identified for the desk based assessment (SHIPLEY 2012) date to this period.
- **2.6.9.** A more detailed historic background will be produced as part of the formal report submitted at the completion of this project.

3. Site Attendance and Aims

- **3.1.**The following groundworks will be monitored by suitably qualified and experienced archaeologists:
 - Groundworks associated with a compound top soil strip
 - Groundworks associated with fencing of a shell midden located at the site
 - All excavation along the existing pipeline, especially where there will be need to excavate below the level of the existing pipeline in order to cut out and repair sections of the existing pipe.
- **3.2.**Works are to be carried out with respect to tidal activity. As such there will be occurrences of operations outside normal working hours.
- **3.3.**Initial site attendance will monitor the topsoil strip for the compound. Further work will be undertaken as a number of return visits to monitor excavations around and below the existing pipeline. This is expected to be carried out in four additional visits. The compound site work is due to commence on 2nd April, with the pipeline works to take place over several episodes over three weeks, commencing 8th April. This will be subject to tide and weather conditions. As this may include night working, adequate artificial lighting must be used. Excavation is to be mechanical using a JCB3CX with toothless ditching bucket.
- **3.4.**The aims of the archaeological works are:
 - to establish the archaeological date, character and nature of any deposits or features present
 - to fully record any archaeological features or deposits encountered during groundworks
 - to ensure that no undue harm comes to the archaeological features present

4. Methodology

- **4.1.**The groundworks will be undertaken using appropriate plant as agreed with GAPS and by hand where appropriate. The plant is to be a JCB3CX with toothless ditching bucket. This will be used to removed deposits deemed to be archaeologically neutral. Where archaeological deposits or features are encountered, hand excavation must take place.
- **4.2.** A suitably qualified and experienced archaeologist will monitor all excavation activities to ensure that appropriate care is taken during the removal of deposits.
- **4.3.**Undifferentiated silting and overburden of recent origin will be removed in successive spits down to the top of the first significant archaeological horizon. Under no circumstances will the site simply be machine excavated without regard for the possible survival of archaeological deposits or features.
- **4.4.**Where work is to be carried out in low light environment, artificial lighting must be engaged to allow for adequate visibility.
- **4.5.**All features are to be recorded stratigraphically, both in plan and section. Features will also be located to national grid co-ordinates.
- **4.6.**Hand cleaning by context will be undertaken to clearly identify the location and extent of any features. All features will be hand excavated to meet the requirements of the project to adequately record the archaeological deposits and associated features or remains.
- **4.7.**Excavation areas will be widened by hand where features extend beyond the boundary of the works in order to properly understand the features. Widening of the excavation area may also be required to allow safe and reasonable ingress and egress for recording purposes, subject to discussion with all parties.
- **4.8.**All finds which constitute Treasure Trove under the 1996 Treasure Act for England and Wales will be reported to the coroner by the finder within 14 days of discovery.
- **4.9.**Relevant specialists will be used if required, however only under agreement by the client.

5. Health and Safety

- **5.1.** This section represents pertinent supplementary information. L P: Archaeology staff will abide by the risk assessment submitted by the groundworks contractor.
- **5.2.** All relevant health and safety regulations will be followed. Safety helmets/boots and high visibility jackets will be used by all personnel as necessary, in addition to any specialist PPE required to safely carry out the works.
- **5.3.**No personnel will work in deep unsupported excavations. Where the installation of temporary support work and other attendance are required, these will be provided as necessary by Dwr Cymru or their groundworks contractor.
- 5.4.The site shall have at least one qualified first aider present at any time and all accidents and injuries shall be reported accordingly to HSE and RIDDOR guidelines. All relevant procedures are held within the full risk assessment.
- **5.5.**All staff and visitors shall undergo a full site induction and will be shown the Risk Assessment. Staff shall sign and date their copies of the risk assessment and visitors shall be required to sign a declaration stating that they shall abide by the site safety guidelines. Copies of these documents are available on request.

6. Recording

- 6.1.A site code has be allocated to the site by L − P : Archaeology, LDN/WSO 13. This code will be used to label (using appropriate materials not adhesive labels) all sheets, plans and other drawings; all context and recording sheets; all photographs (but not negatives); all other elements of the documentary archive.
- **6.2.**The written recording system used will follow the Museum of London Archaeological Site Manual (SPENCE 1994).
- **6.3.**Context sheets will include all relevant stratigraphic relationships and for complex stratigraphy a separate matrix diagram will be employed. This matrix will be fully checked during the course of the excavation. If there is any doubt over recording techniques, the Museum of London Archaeological Site Manual will be used as a guide.
- **6.4.**Individual descriptions of all archaeological strata and features excavated or exposed will be entered onto prepared pro-forma recording sheets. Sample registers, finds recording sheets, access catalogues, and photo record cards will also be used.
- **6.5.** A site location plan will be prepared (OS 1:1250) showing the investigation areas and development site in relation to surrounding locality and street pattern.
- **6.6.**This will be supplemented by a plan at 1:500 (or 1:1000), which will show the location of the excavation trench in relation to the development area. The locations of the OS bench marks used and site TBM will also be indicated.
- 6.7. Detailed plans will be drawn at an appropriate scale, usually 1:10 or 1:20.
- 6.8. The extent of any visible archaeological deposits will be recorded in plan.
- **6.9.**Sections containing significant deposits, including half sections, will be drawn at an appropriate scale, usually 1:10 or 1:20.
- **6.10.**Upon completion of each significant feature a minimum of one section will be drawn. The stratigraphy will be recorded, even if no archaeological deposits have been identified.
- **6.11.**An adequate photographic record will be made of any significant archaeological remains in both plan and section. This will include images illustrating in both detail

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and general context the principal features and finds discovered. The photographic record will also include working shots to illustrate more generally the nature of the archaeological operation.

- 6.12.A register of all photographs taken will be kept on standardised forms.
- 6.13.A Harris Matrix stratification diagram will be compiled on site.

7. Finds and Samples

- **7.1.**All identified finds, artefacts, industrial and faunal remains will be collected and retained. Certain classes of building material can sometimes be discarded after recording if an appropriate sample is retained. No finds will, however, be discarded without the prior approval of the nominated representative of the local authority.
- **7.2.**Unstratified material recovered from the spoil is to be recovered and included with the finds assemblage.
- **7.3.** Material dating to the 19th century shall be retained and included with the finds assemblage.
- 7.4. All finds will be washed and processed to local standards by L P : Archaeology.
- **7.5.**The finds assemblage will be subject to summary analysis, dating classification and storage according to the local standards.
- **7.6.**The following classes of finds will be assessed, in house, by L P : Archaeology:
 - Post Medieval ceramic assemblage
 - Post Medieval glass assemblage
 - Construction material
 - ♦ Wood
- 7.7.Where external finds specialists are required, as determined on site, these finds will be assessed by relevant specialists.
- **7.8.**Marking of finds will include the Museum Accession Number, Finds Number and Context Number. Bulk finds will be bagged in clear self-sealing plastic bags marked with the same Accession Number, Finds and Context Number. Storage will be by standard storage boxes that comply with relevant local specifications.
- **7.9.**The finds assemblage will be retained for deposition with the site archive in the relevant Museum, to be agreed with GAPS. Documentary material including the paper archive, photographic negatives and prints will be stored in boxes to the local standards.

- **7.10.**Photographic negatives will be stored in archival quality polypropylene sleeves with strip divisions, three ring holes, centres 107mm apart and dimensions no greater than, 255mm (from the punched side to the opposite edge) by 300mm. The sleeve should have a white writing strip.
- 7.11.Packaging of all organic finds and metalwork will follow the UKIC/Rescue guidelines, 'First Aid for Finds'. 3rd edition 1998. Any necessary, conservation and treatment of wood or metalwork will be arranged in conjunction with GAPS and specialist conservators.
- **7.12.** All finds and samples will be treated in a proper manner and to the relevant local standards.
- 7.13.Finds will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the guidelines set out in the United Kingdom Institute for Conservation "Conservation Guideline No. 2". Appropriate guidance set out in the Museums and Galleries Commissions "Standards in the Museum Care of Archaeological Collections (1991)" will also be followed, as will the current IFA guidelines.
- **7.14.**Environmental samples will be collected from relevant deposits on agreement with the GAPS such as: riverine silts, pit and ditch fills, deposits overlying floors and contexts relating to refuse disposal, and contexts where organic survival is apparent or suspected. Ongoing communication with environmental specialists will ensure that appropriate samples will be taken during the investigation to satisfy the specialist requirements.
- **7.15.**Ceramic material will be subject to spot dating on site and, where necessary, subsequent analysis will be undertaken in conjunction with the reference types and any series held by any relevant local museums.

8. Reporting

- **8.1.**The report will comprise a written description of the sources consulted and significant features identified. The report will also aid the curatorial service in their determination of any further work that may be required on the site.
- 8.2. The report will include:
 - A concise non-technical summary of the results
 - An explanation of the circumstances of the project, including references to the planning application
 - Location of the site, given to an accurate national grid reference
 - A summary of the sites geology and topography
 - A summary of the historical background of the site
 - A description of the aims and methodology employed during investigation
 - A description of the archaeological data identified supported by scale illustrations and photographic evidence
 - An interpretation of the results
 - A full bibliography
 - A description of the nature, extent and condition of the archaeological finds
 - Summary and conclusion of archaeological works, including comment on the significance of the results both locally and nationally
- **8.3.** A bound copy of the report will be sent to the client, a copy will be sent to GAPS and a further copy sent to the National Monuments Record. A single bound copy and digital version in pdf format will be submitted to the HER and Archaeology in Wales.
- **8.4.**Copyright of all material within the programme shall remain with L P: Archaeology, however the client and the local planning authority will be given a license to use such material for educational, public and research purposes.

9. Archive

- **9.1.**The site code will be used to mark all plans, drawings, context and recording sheets, photographs and other site material during excavation.
- **9.2.**The integrity of the site archive will be maintained. All finds and records will properly be curated by a single organisation, and be available for public consultation. Appropriate guidance set out in the MGC "Standards in the Museum Care of Archaeological Collections" (1992), and the SMA's draft "Selection, Retention and Disposal of Archaeological Collections" (1992) will be followed in all circumstances.
- **9.3.**The minimum acceptable standard for the archival report is defined in the "Management of Archaeological Projects" 5.4 and Appendix 3. It will include all materials recovered (or the comprehensive record of such materials) and all written, drawn and photographic records relating directly to the investigations undertaken. It will be quantified, ordered, indexed and internally consistent. It will also contain a site matrix, a site summary and brief written observations on the artefactual and environmental data.
- **9.4.**United Kingdom Institute for Conservation guidelines for the preparation of excavation archives for long-term storage (1990) will be followed. Arrangements for the curation of the site archive will be agreed with the appropriate museum.
- **9.5.**Pursuant to these agreements the archive will be presented to the appropriate museum within 6 months of the completion of the project (unless alternative arrangements have been agreed in writing with the Local Planning Authority). In addition, written confirmation from the client will be provided for the transfer of ownership.
- **9.6.**A short summary of the results of the work, even if negative, will be submitted to the Archaeology in Wales.

10. Agreement

10.1.This recommended format attempts to define best practice but cannot fully anticipate all contingencies. Material changes are however only to be made with the prior written approval of Dwr Cymru and GAPS.

SOURCES CONSULTED

STANDARDS & GUIDANCE

ENGLISH HERITAGE, 1991. Management of Archaeological Projects

INSTITUTE OF FIELD ARCHAEOLOGISTS, 2006. Guidelines for Archaeological Watching Briefs

- LEIGH D, WATKINSON D (ED.) AND NEAL V (ED.) 1993. First Aid for Finds. United Kingdom Institute for Conservation of Historic & Artistic Works, Archaeology Section.
- MUSEUMS & GALLERIES COMMISSION, 1992. Standards in the Museum Care of Archaeological Collections
- MURPHY, P & WILTSHIRE, P. 1994. A proposed scheme for evaluating plant macrofossil preservation in some archaeological deposits, Circa ea, 11(1), 1-6
- SHIPLEY, J. 2012. West Shore Outfall Archaeological Desk Based Assessment, unpublished archive report for AECOM
- SPENCE, C. 1994. Archaeological Site Manual, London: Museum of London.
- UNITED KINGDOM INSTITUTE FOR CONSERVATION, 1991. Conservation Guideline No. 2
- UNITED KINGDOM INSTITUTE FOR CONSERVATION, 1990. Guidelines for the preparation of excavation archives for long-term storage
- WALKER K 1990. Guidelines for the preparation of excavation archives for long term storage. United Kingdom Institute for Conservation.

WATKINSON, D & NEAL, V. 1998. First Aid for Finds, London: RESCUE.

FIGURES





Llandudno West Beach Outfall Proposed Pipe Cleaning and Reinstatement Method Statement

<u>1.0 Plant Requirements</u> <u>Pumping Equipment</u>

2 x HP water jetting units C/W 150m of jetting hose and jetting head (sprint 200 or similar) with 200 gallon tank capacity

1 x Hydrainer hydraulic 2" high volume pump head and power pack

Access Equipment

1 x tractor/dumper and trailer unit for transportation of pumping and other equipment to worksite 1 x 3SX JCB excavator

Other Plant

Petrol driven circular saw Welding equipment Lifting accessories

2.0 Methodology

<u>Site Set Up</u>

Establish a site compound at a suitable location above the tidal range as agreed by the client. Erect security fencing and appropriate safety signs as required.

Establish any temporary lighting requirements as required.

Mobilise all welfare and storage units to site and set up as agreed with the client.

Mobilise all plant, equipment and materials to site. Materials to be stored appropriately in accordance with statutory requirements COSHH etc.

Preparation of Pipe for Cleaning

At a suitable state of the tide, mobilise the 3SX JCB excavator down to beach to the area adjacent to the 'break' at approximately 761m inshore of the termination point under the control of a banksman/beach marshal.

Set up the excavator adjacent to the pipe break, and excavate the sand from beneath the pipe to a depth of approximately 1m. This is to allow access for operators to work at a comfortable working height in relation to the pipe end.

Set up the excavator at a point 400m seaward of the break under the control of a banksman/beach marshal.

Using the excavator, remove the sand beneath the pipe to a suitable depth to allow access for personnel to work safely beneath the pipe.

Remove marine growth and concretion from around the pipe. Fit cutting guide around circumference of pipe and secure. Measure 1m down pipe, and Remove marine growth and concretion from around the pipe. Fit second cutting guide around circumference of pipe and secure.

Using a Petrol driven circular saw, cut around the underside of the pipe from the 3 o'clock to the 9 o'clock position (the crown being at 12 o'clock and the invert at 6 o'clock) at the first location, following the cutting guide to ensure an even and perpendicular cut. Once this is complete, cut around the underside of the pipe from the 3 o'clock to the 9 o'clock position at the second location. Care should be taken when cutting the underside of the pipe as organic materials within the pipe bore may be ejected during the cutting process.

Using the excavator with a lift capacity of 1 tonne, attach a 2 tonne capacity lifting sling centrally around section of pipe being cut. Take up the weight until the slack is out of the sling.

Using the Petrol driven circular saw, complete the cutting of the pipe over the crown at the first location, and confirm cut is complete using a thin bladed probe. When confirmed, cut the pipe over the crown at the second location.

With the 1m section of pipe now separated from the main outfall pipe, lift out of position using the excavator and lower onto the beach in a safe area under the control of the banksman. This can be removed to the compound area for safe storage on the trailer. The result of the above work is a separate section of pipe 400m in length which can then be prepared for cleaning. For clarity, this can be called section A.

Using the Petrol driven circular saw, cut three number 250mm x 250mm access holes at 100m intervals.

Set up the excavator at a point 300m seaward of the end of section A, adjacent to the swan neck at the termination point under the control of a banksman/beach marshal.

Using the excavator, remove any rock armour from around the pipe, then remove the sand beneath the pipe to a suitable depth to allow access for personnel to work safely beneath the pipe. Remove marine growth and concretion from around the pipe. Fit cutting guide around circumference of pipe and secure. Measure 1m down pipe, and Remove marine growth and concretion from around the pipe. Fit second cutting guide around circumference of pipe and secure.

Using a Petrol driven circular saw, cut around the underside of the pipe from the 3 o'clock to the 9 o'clock position (the crown being at 12 o'clock and the invert at 6 o'clock) at the first location, following the cutting guide to ensure an even and perpendicular cut. Once this is complete, cut around the underside of the pipe from the 3 o'clock to the 9 o'clock position at the second location. Care should be taken when cutting the underside of the pipe as organic materials within the pipe bore may be ejected during the cutting process.

Using the excavator with a lift capacity of 1 tonne, attach a 2 tonne capacity lifting sling centrally around section of pipe being cut. Take up the weight until the slack is out of the sling.

Using the Petrol driven circular saw, complete the cutting of the pipe over the crown at the first location, and confirm cut is complete using a thin bladed probe. When confirmed, cut the pipe over the crown at the second location.

With the 1m section of pipe now separated from the main outfall pipe, lift out of position using the excavator and lower onto the beach in a safe area under the control of the banksman. This can be removed to the compound area for safe storage on the trailer. The result of the above work is a separate section of pipe 300m in length which can then be prepared for cleaning. For clarity, this can be called section B.

Using the Petrol driven circular saw, cut two number 250mm x 250mm access holes at 100m intervals.

<u>Cleaning the Internal Bore of Pipe</u>

At a suitable state of the tide, mobilise the pumping equipment to location of section A pipe using tractor/dumper and trailer. Set up one of the HP jetting units at the end of the pipe break, and the other unit where the section of pipe was removed between sections A and B.

Set up the Hydrainer power pack adjacent to the central hole previously cut into the pipe. Install and secure the discharge hose into the outfall pipe and place the pump head in the water to the south side of the 500mm diameter pipe (a sump may be required for this purpose, this can be dug out using the excavator if required).

Turn on the Hydrainer pumping equipment and ensure that water is being pumped into the outfall pipe. This high volume/low pressure water will enable the liquefied materials to be transported to the open ends of the pipe.

The HP jetting units can then be turned on at each end of section A. The jetting head is designed so that the water pressure forces the jetting head up the pipe, pulling the jetting hose along with it. The rate at which the jetting head progresses through the pipe is controlled by the operator feeding slack hose from the drum reel. The water pressure can also be controlled by the operator at the power pack.

The jetting heads will be allowed to progress through the pipe, and at intervals will be pulled back and forward to ensure that the materials area being adequately liquefied to allow them to be removed by the high volume/low pressure water flow.

When both HP jetting heads have reached the end of their delivery hoses, and if they have not reached the centre point of the pipe, one of the hoses will be drawn back and turned off. This HP

pump will then be remobilised to the access point nearest to the other HP jetting head. The jetting head will then be placed into the access hole so that it is working up the pipe in the same direction as the other jetting head. The HP pump will be turned back on and the HP jetting head allowed to progress inside the pipe. The purpose of this is to allow the first HP head to push materials back to the second HP head, so ensuring materials are sufficiently liquefied to allow them to be washed out of the pipe ends.

The jetting will continue until the water running out of the pipe ends is sufficiently clear to indicate that the pipe bore is free of materials. The HV/LP pumping equipment will be turned off and the jetting equipment withdrawn and turned off.

To prevent sand entering the cleaned pipe bore, a temporary blanking plate with a vent tube will be fitted to either end of the pipe, this will allow the pipe to fill with sea water on the flood tide and expel the trapped air, preventing the pipe sections from becoming buoyant.

The above procedures can then be repeated along similar lines for the section B pipe, where due to its greater length, more use of the access holes for HP jetting may be necessary.

The swan neck can then be cleared of sand using a combination of the HV/LP pumping and HP jetting equipment as required.

All pumping equipment can then be demobilised from the beach to the compound area using the tractor/dumper and trailer unit.

Reinstatement of Pipe

At a suitable state of the tide, mobilise the cut section of pipe taken from between sections A & B using the tractor/dumper and trailer.

Remove the blanking plates and vent tubes from the seaward end of section A and the adjacent end of section B.

Lift the cut 1m section of pipe (spool piece) off the trailer using the excavator and appropriate lifting sling. Fit the Viking Johnson coupling rings to the ends of section A and B and to the spool piece.

Under the control of the banksman, lift the spool piece into position between pipes A and B.

Once in position, rotate the flange rings until the bolt holes on the main pipe sections and the spool piece are aligned. Install the bolts and complete the installation in accordance with the manufacturer's instructions. Tighten bolts to the required torque.

At a suitable state of the tide, mobilise the cut section of pipe taken from between section B and the swan neck using the tractor/dumper and trailer.

Remove the blanking plate and vent tube from the seaward end of section B.

Lift the cut 1m section of pipe (spool piece) off the trailer using the excavator and appropriate lifting sling. Fit the Viking Johnson coupling rings to the end of section B and the swan neck pipe and to the spool piece.

Under the control of the banksman, lift the spool piece into position between the end of section B and the swan neck pipe.

Once in position, rotate the flange rings until the bolt holes on the main pipe sections and the spool piece are aligned. Install the bolts and complete the installation in accordance with the manufacturer's instructions. Tighten bolts to the required torque.

At a suitable state of the tide, mobilise the welding equipment onto the beach using the tractor/dumper and trailer.

Steel inserts can then be welded into the previous cut access holes to seal off the outfall pipe. The insert plates can then be treated with a suitable paint coat against corrosion.

With the works complete, demobilise all plant and equipment from the beach back to the site compound.

OASIS FORM APPENDIX 2

OASIS DATA COLLECTION FORM: Wales

List of Projects | Manage Projects | Search Projects | New project | Change your details | HER coverage | Change country | Log out

Printable version

OASIS ID: Iparchae1-158776

Project details

| Project name | West Shore Outfall | |
|--|---|--|
| Short description of the project | Archaeological monitoring of works along the outfall pipe from Llandudno. | |
| Project dates | Start: 02-04-2013 End: 09-11-2013 | |
| Previous/future work | No / No | |
| Any associated project reference codes | LDN/WSO 13 - Sitecode | |
| Any associated project reference codes | LP1518C - Contracting Unit No. | |
| Type of project | Recording project | |
| Site status | None | |
| Current Land use | Coastland 2 - Inter-tidal | |
| Monument type | NONE None | |
| Significant Finds | NONE None | |
| Investigation type | "Watching Brief" | |
| Prompt | Direction from Local Planning Authority - Planning Policy Wales | |

Project location

| Country | Wales |
|-------------------|---|
| Site location | GWYNEDD MARITIME (BELOW MLWS) West Shore Outfall |
| Postcode | LL30 2AY |
| Study area | 1000.00 Square metres |
| Site coordinates | SH 762000 383000 52 -3 52 55 38 N 003 50 30 W Point |
| Height OD / Depth | Min: 0m Max: 1.00m |
| | |

Project creators

| Name of Organisation | L - P : Archaeology |
|--------------------------|---|
| Project brief originator | Local Authority Archaeologist and/or Planning Authority/advisory body |

| Project design originator | L - P : Archaeology |
|------------------------------|-------------------------|
| Project director/manager | Blair Poole |
| Project supervisor | Matt Jones |
| Type of sponsor/funding body | Water Authority/Company |
| Name of sponsor/funding body | Dwr Cymru |

Project archives

| Physical Archive Exists? | No |
|---------------------------|--|
| Digital Archive recipient | Bangor Museum |
| Digital Archive ID | LDN/WSO 13 |
| Digital Contents | "none" |
| Digital Media available | "Images raster / digital photography","Text" |
| Paper Archive recipient | Bangor Museum |
| Paper Archive ID | LDN/WSO 13 |
| Paper Contents | "none" |
| Paper Media available | "Context sheet","Drawing","Report","Section" |

Project bibliography 1

| | Grey literature (unpublished document/manuscript) |
|----------------------------------|---|
| Publication type | |
| Title | Report for Archaeological Monitoring at West Shore Outfall, Llandudno |
| Author(s)/Editor(s) | Jones, M. |
| Other bibliographic details | LP1518C-AWB-v1.2 |
| Date | 2013 |
| Issuer or publisher | L - P : Archaeology |
| Place of issue or publication | Chester |
| Description | Grey literature report on the results of the archaeological monitoring of repair works on the West Shore Outfall pipe. |
| Entered by | M Jones (chester@lparchaeology.com) |
| Entered on | 9 September 2013 |



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