CONWY WEST SEWAGE DISPOSAL & QUAY PIPELINES - 1994 DEVELOPMENT

Archaeological Monitoring & Recording (Phase II)

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Ymddiriedolaeth Archaeologol Gwynedd Gwynedd Archaeological Trust

REPORT NO. 111

CONWY WEST SEWAGE DISPOSAL & QUAY PIPELINES - 1994

ARCHAEOLOGICAL MONITORING AND RECORDING -Phase II (G1182)

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1. INTRODUCTION

Welsh Water have proposed a scheme for improved sewage facilities for Conwy. The scheme would involve considerable ground disturbance across the length of the quay side area from the Conwy Boatyard to Conwy Road with particularly extensive excavations at the Boatyard site. The Archaeological Curator identified the archaeological implications of the scheme and Welsh Water subsequently commissioned the Gwynedd Archaeological Trust Contracts Section to carry out a programme of work in mitigation.

2. PROJECT BACKGROUND

The work described in this report concludes a series of investigations at Conwy Quay undertaken by GAT in relation to the Conwy West Sewage Disposal and Quay Pipelines project carried out by Welsh Water between 1991 and 1994. Archaeological work carried out prior to November 1993 is described in GAT reports 34, 34a, and 63 and is summarised in GAT report 73. The Phase I development work was undertaken in November and December 1993 and was reported in GAT report 73 in full.

Welsh Water are proposing to build a sewage pumping station in the old Conwy Boatyard Lower Gate Street, Conwy. This will involve the demolition of the existing buildings and the construction of a new pumping station on the site.

In addition, several new pipes will be laid including: a new sea outfall pipe from the pumping station into the estuary, a large 2m diameter storage and supply pipe from the pumping station across the quay to opposite the bandstand, and a 1m diameter rising main which will run from there to Porth Isaf joining a rising main which will run past the Customs House Terrace to join up with an existing rising main in Conwy Road.

A new temporary access road will be constructed from Conwy Road onto the quay and a temporary causeway will be built around the end of the medieval wall which projects into the estuary from Lower Gate Street.

The first phase of this work involved demolition of the Conwy Boatyard, the excavation of trial pits along the foreshore and the installation of the rising main from the bandstand to Conwy Road. The Gwynedd Archaeological Trust was commissioned by Welsh Water to carry out a scheme of archaeological monitoring excavation and recording in tandem with this development work during November and December 1993. This work is now complete and a report was produced (Conwy West Sewage Disposal & Quay Pipelines - 1993, Archaeological Monitoring and Recording - Gwynedd Archaeological Trust report No. 73) and forwarded to Welsh Water and the Archaeological Curator. The Gwynedd Archaeological Trust (Contracts Section) was subsequently commissioned by Welsh Water to carry out archaeological works during February and March of 1994 arising out of the second phase (see below) of the development.

3. THE PROJECT BRIEF

The project brief, prepared by the Archaeological Curator sought to identify the archaeological implications of the Phase II development proposal and specified a programme of work in mitigation. The brief outlined three areas of potential interest within this development requiring archaeological investigation in advance of ground disturbance and/or an archaeological presence during the developer's excavation programme.

i) Archaeological monitoring and recording during excavation for the Large Storage/Pumping pipe (LSP).

ii) A watching Brief to be carried out during preparation for the construction of a Sewage Pumping Station on the site of the former Conwy River Boatyard.

iii) Investigation of foreshore features identified during preceding fieldwork (Phase 1) in advance of the laying of an emergency sea outfall pipe from the site of the new pumping station into the Conwy Estuary. Evaluation in respect of the survival of the town curtain wall beyond its present extent.

Following submittal of the project brief to Welsh Water, GAT was commissioned to prepare a Project Design and Detailed Costings to address the archaeological implications arising from the development. (The full specification is attached as Appendix 1).

4. METHODS AND TECHNIQUES

STAGE 1 - Documentary Search

Supplementary to a detailed desk-based study carried out in Phase 1, photographic evidence became available to GAT from local sources. A series of black and white prints showing various views and activity on the Conwy River and quay side at the turn of the 19th century and during the early 20th century was studied and several photographs selected for inclusion within the project record. Selected prints were enlarged to A4 format by laser copy.

STAGE 2 - Fieldwork

i) Watching Brief on the LSP (TP1 to TP2) and 1050mm Pipe (TP2 to TP3), - Fig 1c.

A watching brief was maintained during the excavation by the contractors of an open pipe trench 3m wide and 5m deep between access shafts TP1 and TP2. The length of the trench (c. 55m) was excavated by tracked Komatsu excavator in 4m sections. Excavation of each section was followed by the insertion of 4m trench boxes to a maximum open length of 12m. The average open length being 8m. Subsequently, precast concrete pipe sections were laid and located before the next trench section was excavated. A second excavator backfilled the trench following the satisfactory completion of the pipe laying operation.

The opportunity for archaeological monitoring of excavated deposits was therefore limited to observation of a 4m section in front of the excavating machine between excavation and the positioning of the next trench box within the open trench. The level of achieved archaeological record was affected by 2 factors in particular. 1) The project design outlined the archaeological response to the development as a 'Grade 2 Watching Brief' consisting of regular inspection of the ongoing work at intervals decided upon by GAT in communication with the contractors. This arrangement proved successful in achieving an adequate intermittent monitoring of stratigraphy disturbed by the trench. 2) Health and Safety considerations in view of the unconsolidated nature of ground to the east side of the trench limited access for visibility to the west side of the trench. Trench stratigraphy was recorded at locations identified in figure 1c with the use of measured sketch sections and scaled black and white and colour photography at 35mm format.

The location of the trench and features of interest were recorded by Electronic Distance Measuring (EDM) survey.

A watching brief was similarly carried out during the excavation for a trench between TP2 and TP3 connecting the scheme to existing services. The trench measured 2m wide, 3m deep and covered a length of c.35m. The stratigraphy within the trench was monitored by regular site visits and stratigraphy/features recorded by black and white and colour photography at 35mm format and sketch sections as appropriate. The trench and areas of interest identified were located by off-set plan.

ii) Emergency Sea Outfall Pipe - Fig 1c.

The development was to include the laying of an emergency sea outfall pipe from the new pumping station eastwards to a discharge point beyond the low water mark opposite Lower Gate Street. The archaeological brief outlined the necessary response to this work as the hand excavation of three 5m x 2m trenches to investigate features identified during the surface survey of the foreshore during Phase I. Timber foreshore features were indicated by a line of irregularly spaced posts (P15-P18) visible on the NE side of Area 2 (see *Fig.1b*) and 2 lines of closely spaced post lines further to the west in Area 2 (P13,14 and stakes, see *Fig.1b*). In addition documentary evidence and a survey of a large spread of collapsed masonry beyond the end of the existing town curtain wall had indicated that the wall originally extended further to the east and terminated in a circular tower.

Investigation of the foreshore features described above was carried out in 2 stages. Initially GAT staff cleared, by hand, approximately 0.20m depth of tidal mud and loose stone from a sample area between P16 and P15 to identify the relationship and implication of the feature and decide upon the response necessary to expose and record the feature. Subsequently it was decided to use a machine to excavate a 1m wide trench immediately to the east and north of the feature to expose its form in elevation and further to place two machine excavated trenches at right angles to the feature to record its relationship to the foreshore stratigraphy (Trench E *Fig 1c*).

Full archaeological recording of the excavated trenches was carried out by GAT staff involving detailed EDM survey, scaled elevation drawings, photography in black and white and colour at 35mm format, and written description. Daily tidal flood waters were removed with the use of a diesel engined water pump.

A trench measuring $5m \times 2m$ by 2m deep (Trench F, *Fig.1c*), was excavated by machine at a point where the emergency sea outfall pipe was to cross the projected line of the original extent of the town curtain wall as identified by the documentary information. The trench was located by tape offsets in line with the pipe corridor. Archaeological recording of excavated deposits involved scaled elevation drawing, written description, and both black and white and colour photography at 35mm format. Tidal flood waters from the open trench were removed with the use of a submersible electric water pump powered by portable engine driven generator.

iii) Sewage Pumping Station Watching Brief (see 'Former Conwy Boatyard' Fig 1c).

Preparation for the pumping station involved the excavation of a large coffer pit $11m \times 16m$ and 10m deep on the site of the former Conwy River boatyard. Archaeological monitoring during Phase I had identified several post-medieval foundations below the boatyard building foundations and a line of driven oak stakes at a significantly deeper horizon in a test pit adjacent to the town wall (see Test Pit B, *Fig.1b*). The watching brief was undertaken to record any further features which might be exposed within the excavated area. Machine work within the coffer pit was closely monitored by GAT to the level of the natural subsoil at a depth of approximately 4m. A photographic record in black and white and colour at 35mm format, written descriptions, and , where appropriate, scaled plans and section drawings were made during the work.

5. RESULTS

i) Watching Brief on the LSP and 1050mm pipe

Stratigraphy excavated within the trench was recorded at eight positions along the line of the trench coded A to H, as indicated on Figure 1c. The following description outlines the results of the archaeological observations made at each available opportunity during the excavation of the pipe trench. As described in section 4, above, the available length of open trench for recording purposes was on average 2 to 4m. The depth of the trench was 5m from the original ground surface. The working corridor for the excavation was c.10m wide and within this area the ground surface level had been reduced by approximately 1m to create a safe working depth. Measurements given are described from the base of the excavated trench to the reduced surface level.

Position A

Between points A and A1 a formal record of stratigraphy was not possible due to disturbance of the trench sides. Therefore the section available for recording was partially obscured and a general impression only was recorded. Concreted orange gravel subsoil was cut at the base of the trench. Overlying this was 0.5m of a firm grey clay without inclusions. Approximately 1.0m of a silvery grey silty clay sealed this deposit and was in turn sealed by a thick band of loose grey brown mixed gravel with inclusions of visibly modern debris to the top of the trench.

Position B

Between points B and B1 1.6m of concreted orange gravel subsoil was sealed by 0.6m of a silvery grey clay with rounded stone inclusion. Overlying this was 0.30m of greyish brown silty sand with a frequent inclusion of shell debris. A 1.5m depth of mixed overburden made up of varying soils, gravels and sands with inclusions of modern and post-medieval waste was present to the top of the trench.

Position C

Between points C and C1 orange gravel subsoil 1.6m in depth was sealed by 0.10m of silvery grey clay. The next layer comprised 0.70m of a loose greyish brown sandy silt. Over this was a thin (0.15m) layer of grey sandy silt containing much shell debris. This was overlain by 0.5m of loose greyish brown mixed shale and fine gravel. The uppermost layer was made up of 0.90m of mixed recent overburden as described above.

Position D

Between point D and D1 concreted orange gravel subsoil was sealed by clean grey clay made up the lower half of the excavated trench. Over this grey clay deposit was 0.20m of black silty sand with inclusions small pebbles and mixed shell debris. Overlying this was 0.20m of loose orange grey gravel similarly with an inclusion of mixed shell debris. Sealing this deposit was 0.10m of greyish brown silty clay. Overlying this deposit was 0.60m of very loose medium gravel. This was sealed by 0.20m of highly compact dark grey gravel silty clay mix containing a significant shell inclusion. The uppermost deposit comprised 0.40m of loose light brown gravel with further shell inclusions.

Position E

The opportunity for detailed recording at position E was not available. However a brief written record was made for stratigraphy between points E and E1 which correlated closely to that observed at position D. That is not repeated here.

Position F

Between point F and F1 0.20m of concreted orange gravel subsoil was sealed by 2.5m of alluvial gravel containing much shell debris. Overlying this was 0.50m of dirty brownish orange clay containing small sub-angular; stones, shell and slate waste. This was sealed by 0.20m of loose brown silty sand. Deposits making up the remaining levels comprised 0.30m of orange brown stony clay with inclusions of modern brick and 0.30m of crushed mortar and stone building waste.

Position G

Between G and G1 stratigraphy in the trench was observed to be similar to that observed at position F. The only significant change being that deposits below the deep alluvial gravel were made up of 0.5m of dark grey almost black silty sand with much rounded stone inclusion overlying the natural subsoil of orange sandy gravel. Deposits overlying these layers are as described above at position F.

Position H

Between points H and H1 0.80m of orange cemented gravel contained occasional large rounded boulders up to 350mm. This was sealed by 0.20m of stony silvery grey clay. 0.30m of small angular stones in a matrix of black silty sand with shell inclusion made up the next deposit. Overlying this was 1.7m of alluvial gravel and shell debris. The uppermost deposit was of mixed yellowish brown sand with lenses of mixed clay sealed by 0.20m of compact dark brown earth.

Position I (TP2) - The Old Quay Wall

Beyond position H excavation of the trench exposed remains of a substantial stone built wall surviving to a height of 2.2m and orientated parallel with Lower Gate Street (see *Plate 1*). Provision for adequate archaeological recording of the feature was agreed between GAT and the contractors on site. This allowed time for photographic and location survey and written descriptions. Any more detailed recording was unnecessary due to previous recording having been achieved during replacement of an adjacent gas main. (See GAT report 74).

The wall, was founded on a bed of irregular sub-angled rubble, roughly mortared and 0.25m deep overlying the concreted orange gravel subsoil. The wall foundation based on this footing comprised a single course of large (up to 800mm) squared stone blocks. The upper wall fabric was of irregularly coursed and shaped, but well faced stone, surviving to a maximum height of 2.2m from the base of the foundation deposit. The top of the feature had been disturbed by the laying of the aforementioned gas main. The bonding matrix of the wall was of a coarse grained lime mortar. In places within the upper half of the wall, a brown hard set 'clay' type material had been pressed into the joints. No foundation cut for the structure was visible in the section on either side of the feature. Deposits fronting the wall were as follows:

Overlying the orange subsoil was 0.25m of clean grey clay. This was sealed by 1.0m of loose yellowish brown sandy gravel with shell inclusions. A thin lense of dark grey sandy silt sealed the gravel deposit and was in turn sealed by a further 0.60m of course gravel bounded by a matrix of dark grey sandy silt. The uppermost deposit was 0.20m of mixed gravel and yellow sand.

Following the recording of the quay wall elevation, the trench was excavated through the wall fabric providing an opportunity to observe the width and nature of the feature in section. The wall measured 2.3m wide with an even rear facing surviving to a height of 1.9m. The wall core material was of irregularly coursed and mortared sub-angular stone throughout its profile. Deposits to the rear of the feature were disturbed by modern surfaces to a depth of 1.1m. No foundation cut for the feature was apparent.

Positions J & K - The 1050mm pipe (TP2 to TP3) Fig. 1c.

During excavation of a trench 2m wide and 3m deep connecting TP2 to TP3 the old quay wall was revealed in two further locations and was seen to curve sharply to the west at a point opposite Porth Isaf.

Between TP2 and Position J, the line of the old quay wall could be seen in the eastern section of the excavated trench. The wall survived to within 0.30 and 0.10m of the road surface. Deposits to the east of the rear facing of the wall were disturbed by various services and evidence for archaeological deposits directly associated with the use of the wall was not available.

Between J and K the old quay wall was observed to curve towards the west, back across the excavated trench and Lower Gate Street. The profile of the feature was recorded with associated deposits at point K. The wall retained the same construction as described above. The deposits on its northern side were as follows:

1.1m of clean grey clay was sealed by 0.8m of light yellow mottled brown clay. Overlying this was 0.20m of dark grey silty clay. 0.40m of dark brown earth mixed with building debris (mortar, brick etc.) overlay this, and was sealed by the recent road make up of 0.40m of hardcore and tarmac. No evidence for a construction cut was noted.

ii) Emergency Sea Outfall Investigations and Watching Brief.

Trench E

In advance of excavation for an emergency sea outfall pipe into the estuary from the former boatyard site, Trench E (see *Fig.1b & c, & Plate 2*) was machine excavated under the supervision of GAT to identify and record what appeared to be an extensive foreshore structure indicated by a series of wooden posts visible on the surface within the tidal zone. Preliminary investigation by hand had revealed that structural stonework was present associated with the posts. The results of the excavation of Trench E are illustrated by plan and elevation on *Figs*, 2a, b, c and described briefly below.

Excavation of Trench E revealed a timber and stone built 'wharf ' some 30m in length running parallel to the town wall and turning sharply to the south in an L-shaped curve to join the end of the wall. The structure seemed to consist of three distinct building phases representing the apparent extension of the feature at various times from the existing shoreline. Phase 1 (see consisted of a well constructed revetment wall of faced dry-stone build. Fig. 2b)The construction terminated as shown in the illustration where it appeared to be associated with a timber revetment of disused railway sleepers (post line P31 Fig. 2a) joining the wall to a point on the town wall. Phase 2 was an extension northwest of this. A revetment of large rounded boulders was butted to the end of the phase 1 wall and extended the feature for 2.4m to the north where the construction took the form of a further revetment of driven railway sleepers capped with at least one course of dry-stonework. This construction was terminated by a large timber pile (P34, Fig.2b & c). The final phase of the feature was the addition from this point of a series of smaller timber piles spaced at approximately 2m centres fronting a stone built In places the stonework only survived as one course and was missing revetment wall. altogether from the western end of the feature. The construction was best preserved at its east end where up to two courses of dry-stone revetment survived.

Identified in the west facing section of the trench at the position indicated in figure 2a was a large collapse of mortared masonry (Section 8, Fig.2c). The deposit, lying just beyond the end of the existing town wall was of a similar nature to the medieval wall construction but with its mortared stone coursing resting in a near vertical position.

Trench F

A trench 5m x 2m x 2m in depth was excavated some 20m beyond the end of the existing town wall at a point where the emergency sea outfall trench was to cross the projected line of the wall (*Fig.1b & c*) estimated from documentary sources,. The excavation revealed only horizons of alluvial silts and gravels (*Fig.2d*). No features of archaeological significance were identified. Evidence of collapsed masonry or loose stone was not present within the trench.

Watching Brief on the Sea Outfall Pipe Trench

Prior to the excavation of a trench for the emergency sea outfall a surface survey was made of the extent of a stone spread visible within the foreshore mud to the east of the existing town wall (*Fig.1c*). The survey identified a sub-oval area of loose stone covering an area some 15m by 20m. Observations made during the excavation of the trench indicated that a large amount of collapsed masonry and some probable in-situ stonework did survive within this area. Collapsed masonry observed in Trench E was revealed in section at points indicated in Figure 2a. The form of the wall material was a conglomerate of intact mortared stonework up to 2m in height and 6m in width.

Archaeological monitoring during the excavation of the trench for the emergency sea outfall pipe identified further collapsed masonry deposits in the north facing section in this area. Immediately to the east of this point, further stonework was located. In this case, however, a 9.5m length of coursed and mortared stonework, was identified, clearly in situ, forming part of a stone built foundation. The eastern and western extent of the feature was indicated by abrupt termination of the masonry in what appeared to be curving facing. The maximum remaining height of the feature was c.1.0m.

iii) Pumping Station Watching Brief (Area 2, Fig. 1c)

Archaeological monitoring during excavation for deep foundations on the site of the former Conwy River Boatyard revealed a succession of alluvial silts, gravels and made ground of a similar nature to those deposits recorded elsewhere within Area 2 (Phase 1). No features or occupation horizons of archaeological significance were present. Post-medieval material in the form of several large worked timbers were recorded as non-structural inclusions within a deposit of dark grey silty clay containing much post-medieval refuse material at approximately 3m depth. At a depth of 3.5m a stony grey clay overlay clean orange gravel clay, the natural glacial horizon.

6. INTERPRETATION AND APPRAISAL OF RESULTS

Excavation for the LSP provided an opportunity for the extensive recording of foreshore deposits at the Lower Gate Street waterfront and further information on the extent and form of a buried stone built quay running the length of Lower Gate Street. The history of the quay and the nature of deposits on the immediate foreshore appear closely interrelated. A clean, grey, sticky, clay was invariably found overlying natural subsoil within the length of the LSP trench. The deposit was also observed to lap the base of the Quay wall. Deposits overlying this layer generally appear to represent a succession of alluvial depositions resulting in loss of depth at the quay side. At some point, the area was subjected to widespread dumping of shore based deposits creating the present shallow gradient waterfront and, in the process, burying the former quay wall.

It appears likely that the decision to abandon use of the quay side was a result of the deposition of large amounts of alluvial gravels, particularly noted at the southern end of the LSP trench where single deposits of up to 1.5m in depth were recorded. A possible cause of this may be the construction of The Conway Road causeway and bridges in the 19th century which brought about significant changes to the local topography of the estuary bed and harbour area.

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Archaeological evidence for the date of construction of the quay wall was not directly available from the limited recording of associated deposits. Documentary map evidence however from the 18th century (specifically, 'Map of Conway Town' - Holland Estate Map 1776, and 'Conway Town and Castle', Pennants Tour of Wales Vol II p.331) shows a 'quay' or 'strand' located in this position. (See GAT report 74, for full documentary study). On the evidence of deposits forming made ground on the foreshore containing inclusions of late post-medieval material only , the quay side appears to have been buried some time in the 19th century.

Investigation on the north side of the town wall identified a late timber and stone wharf structure, clarifying the nature of a series of timber posts which had been recorded as part of a survey of the foreshore during Phase 1 of the project.

The extensive 'wharf' or mooring feature revealed by the excavation of Trench E (see Fig.2a&b) appears, from its construction and use of materials, to date from some time in the 19th/early 20th centuries. Photographic evidence from around the turn of the century of this part of the Conwy foreshore, studied as part of documentary material made available to GAT during the fieldwork (see section 4.1, above), clearly shows activity in this area associated with the mooring of small craft and the position of a large open boathouse adjoining the town wall. Evidence for the boathouse was revealed during the demolition of the former Conwy River Boatyard buildings during Phase 1 of the project (see W1 & W4, Fig.1b in the present report, and GAT report 73.). These features would appear to have been superseded in the early part of this century by the more extensive boatyard development only recently demolished as part of this project.

Documentary reference to a stone tower beyond the present end of the town curtain wall was confirmed by the recording of collapsed masonry of the wall and in situ curving foundations probably of the former tower to the east of the present wall end.

The actual position of the tower (see Fig. 1c) is contrary to that indicated by the documentary evidence which describes: "70 yards of wall and ruins of a large tower... visible in 1835". This would place the tower some 20m further out into the estuary than the structure identified in the present works. Trench F revealed only alluvial deposits and no trace of the ruined wall and tower in the area indicated by the documentary evidence.

Observations made during deep excavation for the Pumping Station in Area 2 (Fig. 1c) revealed a sequence of deposits representing alluvial deposition of marine silts and gravels overlain by various dumps of material presumably designed to claim the area for development in the post-medieval and modern periods. No evidence for significant earlier archaeological horizons or occupation was identified.

7. ACKNOWLEDGEMENTS

Gwynedd Archaeological Trust would like to acknowledge the assistance of Wallace Evans Ltd, main contractors Daniel Pipelines Ltd and Dew Group Ltd, and Mr Cyril Davies for their assistance during the course of the project.

APPENDIX I

Project Design

PROJECT DESIGN FOR ARCHAEOLOGICAL INVESTIGATIONS & RECORDING: CONWY WEST SEWAGE DISPOSAL AND QUAY PIPELINES - PHASE II (G1182)

Prepared for Welsh Water - 11 February 1994

1. PROJECT BACKGROUND

Welsh Water are proposing to build a sewage pumping station in the old boatyard Lower Gate Street, Conwy. This will involve the demolition of the existing buildings and the construction of a new pumping station on the boatyard site.

In addition, several new pipes will be laid including a new sea outfall pipe from the pumping station into the estuary, a large 2m diameter storage and supply pipe from the pumping station across the quay to opposite the bandstand, and a 1m diameter rising main which will run from opposite the bandstand past the Custom House Terrace to join up with an existing rising main in Conwy Road.

A new temporary access road will be constructed from Conwy Road onto the quay and a temporary causeway will be built around the end of the medieval wall which projects into the estuary from Lower Gate Street.

The Gwynedd Sites and Monuments Record has identified the archaeological implications of the project proposal and specified a programme of work in mitigation. The first phase of this work is now complete and the Gwynedd Archaeological Trust (Contracts Section) has been asked by Welsh Water to prepare a project design and costings to satisfy the archaeological implications for the second phase (see below).

2. KNOWN ARCHAEOLOGY

A stone walled hillfort caps Conwy Mountain one mile to the west. A Cistercian abbey was founded in Conwy c. 1192 on what was presumably royal land. A timber hall, later known as Llywelyn's Hall, stood to the west of the abbey church. In 1283 a stone castle was constructed on a rock outcrop overlooking the estuary. A planted borough was appended enclosed by stone walls and containing 122 burgage plots. The abbey was displaced to Maenan but the abbey church was retained to serve the new community. The town saw little development during the later middle ages with many open areas surviving as gardens into the late 18th and early 19th centuries.

The area of the modern quay is delineated by a medieval wall which projects down the foreshore from Lower Gate Street. It is known that this enclosed area also served as a quay in medieval times, providing a protected landing site for supplying the medieval town and castle. There would also likely have been various wharves and jetties projecting from the medieval quay to serve the transport ships.

Trial pit excavations for geological investigations associated with the present project have indicated a considerable buildup of dumped and accumulated material dating from at least the 18th century in the area of the proposed development. However, the depth of these intrusions was limited and no natural or river terrace deposits were identified. Therefore it is possible that this later dumping has sealed the earlier archaeology. One larger test pit excavated adjacent to the medieval wall projecting into the estuary revealed an organic layer located some 1.5m below the present ground surface and containing shaped timbers and bone. It is possible that this represents the remains of some collapsed structure, although unfortunately, no dating material was recovered. This organic layer sealed a layer of thick river clays which could preserve even earlier archaeology or palaeo-environmental remains.

3. PROJECT BRIEF

The proposed development will involve considerable disturbance of the ground from the boatyard right across the quay to Conwy Road. Considering the proximity of important surviving archaeological remains and structures (the town walls and castle), and the known use of this area as a quay in the medieval period, it is quite possible that this disturbance will uncover further archaeological features or deposits of importance. Appropriate archaeological recording and investigations should be undertaken to ensure that all archaeology which is likely to be affected by the development proposals has been adequately recorded. For the Phase II work, the following specific areas of potential archaeological impact have been identified:

i) The Construction of the Sewage Pumping Station

There appears to be little evidence for significant archaeology in this area from the available documentation. In addition, the Phase I archaeological works did not suggest intensive activity or structures in this area.

Actions: For these reasons it has been recommended that a watching brief only be mounted to monitor and record any features or items of archaeological interest which may nonetheless be revealed during the development works. Recording level as appropriate or as possible considering health and safety and access.

ii) The Large Storage/Pumping Pipe

(plus manholes P2, P3 and connecting pipe trench)

The Phase I work revealed a significant organic layer at a depth of 1.5m in the area of the large storage\pumping pipe containing occasional timber both in situ and 'floating', and a deposit of concentrated leather and bone. This layer is some 1m thick and seals a further clay layer which also may contain archaeological or palaeo-environmental remains. Although the Phase I trial trenches sampled only a small percentage of the area to be disturbed for the storage pipe, in general, it would seem that this area is below the medieval shoreline and of limited potential archaeologically. However, the pipe trench cuts back towards Porth Isaf at its S end. A watching brief carried out on the installation of a gas main down from the arch at Lower Gate Street to Porth Isaf revealed an earlier stone quay and it is likely that the storage pipe trench will clip the S end of this structure.

Actions: It is recommended that a watching brief be carried out to monitor and record any archaeological features which may be uncovered by the development works. Section drawings should be maintained of the sequence of deposits across the area of the proposed disturbance where this is compatible with health and safety and access constraints. In addition, where the pipe trench contacts the remains of the quay wall, detailed recording should be carried out of this feature .

iii) Emergency Sea Outfall

A large trench is to be excavated from the new pumping station out into the river estuary for an emergency outfall. This proposed trench appears to run across the projected line of the medieval wall which runs down from Lower Gate Street into the river. It would appear that this wall was originally much longer and was terminated by a stone tower. Rough measurements of this were recorded in 1835 when presumably it was still visible either standing or as ruined foundations. In addition, the line of the proposed pipeline will intersect with a series of driven posts located in the Phase I recording. Actions: Naturally the location and state of survival of the medieval wall is of some interest both for archaeological and engineering reasons. In discussions with Welsh Water, it has been decided that Wallace Evans will arrange for the trench to be excavated for the outfall over the area where it potentially affects the line of the medieval wall. When this trench is due to be excavated the Trust will be informed so that arrangements can be made to have archaeologist(s) present to monitor and record the presence and extent of any surviving masonry. The level of recording will be dependent upon health and safety and access considerations as well as the timing of tides. However, if the masonry is present then as full recording as possible should be carried out.

In addition, two trenches will be excavated each approximately 5m x 2m along the line of the sea outfall to investigate and record the driven timber features identified in the Phase I work. These will, as far as is possible given the constraints imposed by the development programme and the tides, seek to identify the nature, depth, quality and extent of the structures represented by the driven timbers.

3. ARCHAEOLOGICAL PROJECT AIM

The aim of these archaeological investigations is to record in a full and detailed manner the presence/absence, extent, condition, character, quality and date of any archaeological deposits within the whole of the area potentially affected by the development.

4. METHODS AND TECHNIQUES

As recommended by the Gwynedd Sites and Monuments Record acting as the archaeological curator, this specification is designed to comprise a fieldwork stage to be followed by a detailed report:

i) Fieldwork Stage

A limited amount of trial trenching will be undertaken through the excavation of a series of trenches in the area to be disturbed by the sea outfall (see above 3 iii). The exact positions of these trenches will be agreed on site with Welsh Water's representatives. In addition a watching brief will be mounted during the excavations for the large storage pipe on the foreshore and for the new pumping station.

All archaeological trenches will be opened and excavated by machine down to the first significant archaeological horizon. The machine work will be supervised by an experienced archaeologist. Once a significant archaeological horizon has been defined, this will be cleaned by hand and features revealed. The trenches will be hand excavated and recorded according to the normal principles of stratigraphic excavation and all stratigraphy will be recorded even if the trench exhibits no sign of human activity.

Any human remains which may be encountered will initially be left in situ and if removal is deemed necessary, this will comply with the relevant Home Office regulations.

All recording including watching briefs will involve written descriptions on standard Gwynedd Archaeological Trust context forms, plans at 1:20 scale, sections at 1:10 scale where possible or appropriate, scaled black and white photographs and colour slides at 35mm format.

Any finds will be sampled and located three dimensionally if significant and environmental samples will be taken where appropriate.

NB The majority of this work will be sited on the tidal foreshore. This will almost certainly mean that it will be affected by high tides which are likely to fill the trenches and require

pumping and extra work to keep clear as well as shortening the work day. In addition, there is also a health and safety implication requiring that at least two staff be working in any of the trenches at all times.

FIELDWORK STAGES (Summary):

i) Construction of the Pumping Station (ground disturbance) - watching brief - (estimate) six man-days

ii) The Large Storage Pipe (and P2, P3 and pipe)

- watching brief - (estimate) eight man-days

- recording S end of old quay wall- two man-days

iii) The Emergency Sea Outfall

- recording trench over medieval wall projection - 8 man-days

- recording timber structures - 13 man-days (completed)

5. FINAL REPORT

Following the completion of the fieldwork a report will be produced for submission to Dwr Cymru/Welsh Water and The Gwynedd County Sites and Monuments Record. This will detail and synthesise the results of the Phase II investigations and relate them to the results of Phase I. It will comprise:

a) a copy of the agreed Project Design,

b) a plan drawing showing the site and its location in relation to published boundaries and OS datum.

c) plans at an appropriate scale showing trench layout (as dug) and features located as well as, where possible, predicted archaeology

d) other illustrations as appropriate

e) a description of the archaeology revealed including its extent and character, interpretation, and date, and an assessment of its condition and importance (quality and state of preservation)

f) a full bibliography of sources consulted

The report will be compiled using WordStar7 software. The client will be supplied with one hard copy of the report with further copies at cost (a copy of the report can also be supplied on disc if required). A copy will also be lodged with the Gwynedd County Sites and Monuments Record on the understanding that this will become a public document after an appropriate period of time (generally not exceeding six months).

Staff: two Grade: Project Officer Time: 6 man-days

6. DEPOSITION OF ARCHIVES AND FINDS

A full archive including plans, photographs, written material and any other material resulting from the project will be prepared. All plans, photographs and descriptions will be labelled, and cross-referenced, and lodged in an appropriate place (to be decided in consultation with the Sites and Monuments Record) within six months of the completion of the project.

Staff: one Grade: Project Supervisor Time: two man-days

7. PERSONNEL

The work would be supervised by the Trust's Project Manager (Contracts), Mr Roland Flook. The work would be undertaken by one of the Trust's Archaeological Project Supervisors and carried out by fully trained Project Assistants.

8. MONITORING

The Gwynedd County Sites and Monuments Record are responsible for monitoring progress and standards throughout the project. Provision has been made to accommodate field visits by the SMR for monitoring during the trial trenching and once the fieldwork is complete to discuss the results.

9. TIMING

Because of the shortness of the development time scale, The Trust has already commenced certain elements of the work identified above . We would be able to continue to make personnel available to respond to the development schedule should the project design and costings be judged acceptable by the client. The scheduling and duration of the archaeological work stages would, of course, be dependent upon the development programme as well as, to some extent, upon the weather, for which some allowance has been made. However, it should be possible to carry out the programme of work in line with the following schedule:

From January 27 1994

- watching brief on large storage pipe excavations (S of medieval wall)

- investigation and recording of driven timber structures (N side of medieval wall) (completed February 9)

From February 14 1994

- recording of S end of old quay wall in large storage pipe trench

From February 14 1994

- watching brief and recording of contractors' excavation of sea outfall trench above projected medieval wall



Plate 1. East facing elevation of Old Quay wall



Plate 2. Detail of timber and stone wharf, trench E.



