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Summary

The construction works did not impact upon the wreck of the City of Ottawa, the mitigation strategy successfully implemented.

Reduction of silt and the beach did not reveal deposits of any antiquity, tidal action removing any putative remains.

1 INTRODUCTION

1.1 The contractor

Gerry Martin is an independent free-lance archaeological contractor with nearly 30 years experience of commercial archaeology in Britain, Norway and Germany. Gerry Martin Associates Ltd specialises in the expedition of fieldwork projects. These include the field management and direction of large capital projects to execution of smaller watching briefs, evaluations, building surveys and excavations.

All projects are carried out in accordance with PPS 5 (2010) and the guidelines and recommendations issued by the Institute of Field Archaeologists and English Heritage. Gerry Martin has achieved the accreditation level of MIfA (Member) with the Institute of Archaeologists (IfA).

1.2 The Commission

Gerry Martin has been commissioned by Mr Dylan Jones representing Martin Wright Associates Ltd (the client) to prepare a Specification of Works for a Programme of Archaeological Watching Brief Action relating to the reconstruction of the coastal defences at West Rhyl (figure 1).

The watching brief action has been requested by Denbighshire County Council as part of the Environmental Impact Statement.

The development of the study area involves the removal of estuarine silt and beach deposits in order to insert sheet piling and provide the desired formation level.

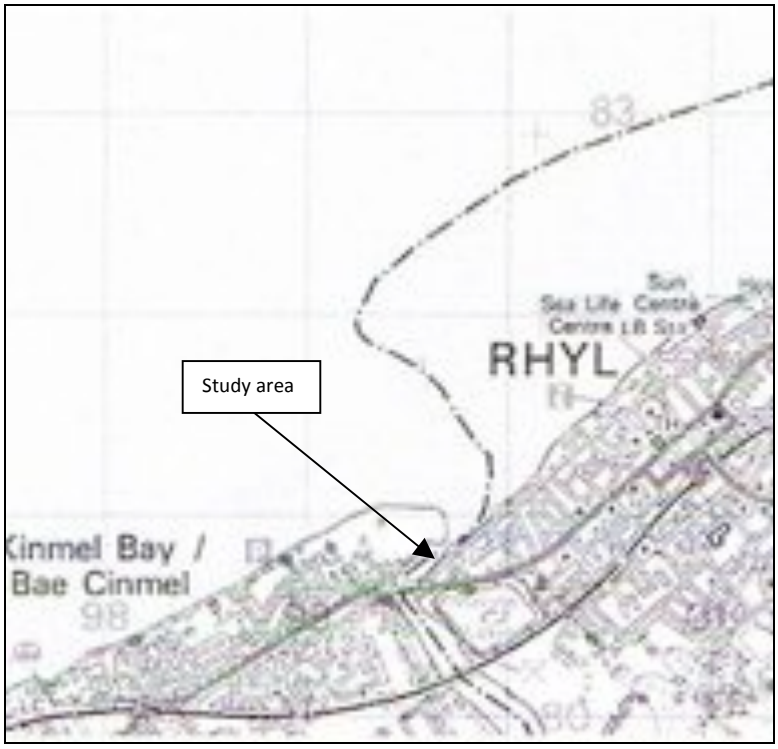

Figure 1. Location of the study area (OS Copyright, Licence no. 100044205)

1.3 In connection with the commission

Because of the archaeological significance and sensitivity of this location, the curatorial planning authority has stated that permission is subject to the "contractor" securing the implementation of a formal programme of archaeological observation and investigation during the forthcoming development.

A scheme of investigation (WSI) was been produced by the archaeological contractor that details the methods and procedures to be employed during the watching brief action. It was submitted to the curatorial authority (Fiona Gale, County Archaeologist Denbighshire County Council) and was subsequently approved.

2. METHODOLOGY

2.1 Project Design

Gerry Martin Associates Ltd were commissioned to undertake the archaeological fieldwork by Mathew Wright Associates Ltd following approval by the curatorial body, Denbighshire County Council.

The watching brief focused upon and examined the following elements:

1. Disturbance of the foreshore through invasive excavation by plant
2. Removal of foreshore deposits that may contain past cultural material
3. Putative palaeo-environmental soil horizons buried by later tidal or estuarine deposits
4. Contact area with the wreck of the *City of Ottawa*

The following report has been assembled to the relevant standards and protocols of the Institute of Field Archaeologists (Standard and Guidance for Archaeological Watching Briefs, 2001), combined with accepted best practice and in accordance with the brief prepared by the curatorial authority.

Fieldwork took place between June 14th and July 13th 2011.

2.2 Archive

The archive has been compiled in accordance with the project design and the guidelines set out by English Heritage (1991) and the Institute of Field Archaeologists (2008).

The archive will be deposited with an appropriate repository and a copy of the report donated to the County Sites and Monuments Record, as requested by the curatorial authority.

3 BACKGROUND

3.1 Location, topography and geology

The study area comprises low-lying tidal mud flats resting above a shingle beach within Foryd harbour. Long shore drift has enclosed the harbour to the north, a small inlet providing access to open water (figure 2). The tidal range can be considerable, up to 4.00m at high tide.

Figure 2. Aerial photograph of the study area

Formal management of the waterfront began in the inter-war period of the 20th century when the 6.00m high promenade forming the sea wall was extended westwards up to the 1930s road bridge.

The widespread low lying area to the south indicates that the mouth of the river was once wider, forming a flood plain.

An advantageous location that may suggest earlier settlement, Rhyl as a town was largely uninhabited with a population of only 300 by the turn of the 19th century. By the 1830s it had become a fashionable watering hole, enlarging during the Victorian period and developing into a favoured holiday resort.

As part of this boom a thriving brick industry was established from 1840 onwards. However, there appears to be little documentary evidence for ship-breaking although a postcard from *circa* 1900 shows craft using the harbour and two large sailing ships (extreme left, figure 3) of which one possesses three masts, similar to the *City of Ottawa*.

Figure 3. Postcard circa 1900 showing study area

West Rhyl is now subject to regeneration after recent economic decline.

4. HISTORICAL CONTEXT

4.1 Desk-based assessment

The study area was extensively surveyed during 2008 by Gifford, Chester (Gifford Report 14533, 2008, 5).

The survey focused on the wreck of the *City of Ottawa* a vessel that rests on the landward side of the banks of the River Clwyd towards the downstream limit of its estuary, grid reference SH 9959 8069 (figure 4). The wreck is located a few metres from the sea wall upon a silty mudflat, exposed at low tide.

The *City of Ottawa* is a historic wreck recorded by the Royal Commission on the Ancient and Historic Monuments of Wales (NPRN Ref 442) and by the regional Historic Environment Record held by Clwyd-Powys Archaeological Trust (PRN Ref 34275).

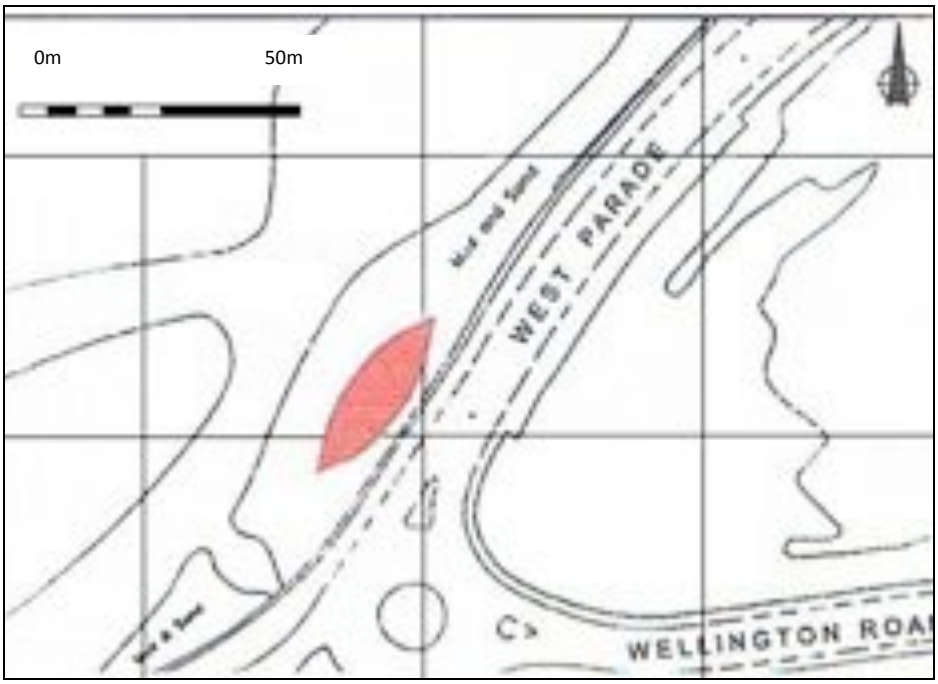

Figure 4. Location of the *City of Ottawa* (after Gifford)

Previous research has been undertaken by the following investigators and institutions.

- A detailed examination of the vessel site and review of historic data conducted by Bryan Smith in 1994.
- A review of the information on the *City of Ottawa* prepared by the Archaeological Diving Unit from St Andrews University and deposited with the National Monument Record maintained by RCAHMW.
- A historical review of the vessel, crew, master, voyages, ownership and arrival at Rhyl undertaken by Ian Brown and Fiona Gale published in the 2007 volume of the *Transactions of the Flintshire Historical Society*.
- A survey of the wreck compiled by Gifford, Chester in 2008.

The *City of Ottawa* was a Canadian three-masted vessel finished in 1860 at the boatyard of J.E.Gringas & Son on the St Charles River, Quebec.

The ship sailed to Liverpool in 1861, offered for sale and registered with Lloyds in 1863. The first documented voyage was between England and Canada in 1863, the vessel completing 36 voyages before its last in 1889.

Up to 1896, its movements are unrecorded but in 1897 the Certificate of British Registry was rescinded and the vessel was used as a hulk containing government stores in the south of England. This function continued until 1906 when Lloyd's List records its safe arrival at Rhyl harbour (Brown and Gale 2007, 103).

Thereafter, the ship appears to have been broken up as the Foryd maintained a ship-breaking industry in the late 19th early 20th centuries.

The vessel occupying an area 50m x 10m was abandoned but the vessels frame has survived and is visible at low tide. It was surveyed in detail during late 2007 by Gifford, its current preferred monument status being preservation *in situ*.

5. RESULTS

5.1 Development proposals

Formed from reinforced and poured concrete, the coastal defences across the harbour frontage are between 60 and 110 years of old but are now showing signs of fatigue and could be breached by an inundation.

The restoration scheme involves reinforcement of the current promenade retaining wall with rock armour and sheet piling from the east of Foryd Bridge through to the training groyne to the east of the River Clwyd.

The £10.6 million scheme will serve as a coastal flood defence as well as a cultural amenity is promoted by Denbighshire County Council and is also funded by the Welsh Assembly and The European Union Convergence Fund is to be completed by summer 2013.

The two invasive elements within the construction programme were identified:

1. Excavation of a 1.50m guide trench that removed erratic stones and rocks from the upper part of the sheet piling configuration

2. Removal of superfluous silt and sand in order to establish a firm finished level that could accommodate a concrete blinding

Both tasks required archaeological monitoring as requested under the terms of the watching brief specification.

To assist the provenance of any observation, the study area was divided into sections (figure 5) that accorded with the construction programme. These construction sections can be summarised as:

- Section A; bridge to outfall requiring silt removal and excavation of the piling trench (blue outline

- Section B; outfall to the end of the silt bar requiring silt removal and excavation of the piling trench whilst monitoring the extant remains of the City of Ottawa (green outline)
- Section C; end of silt to the proposed pontoon requiring excavation of the guidance trench (yellow outline)
- Section D; proposed pontoon to a concrete groyne requiring excavation of the guidance trench (pink outline)
- Section E; concrete groyne to the beginning of the training wall requiring excavation of the guidance trench (brown outline)
- Section F; the training wall requiring excavation of the guidance trench (violet outline)

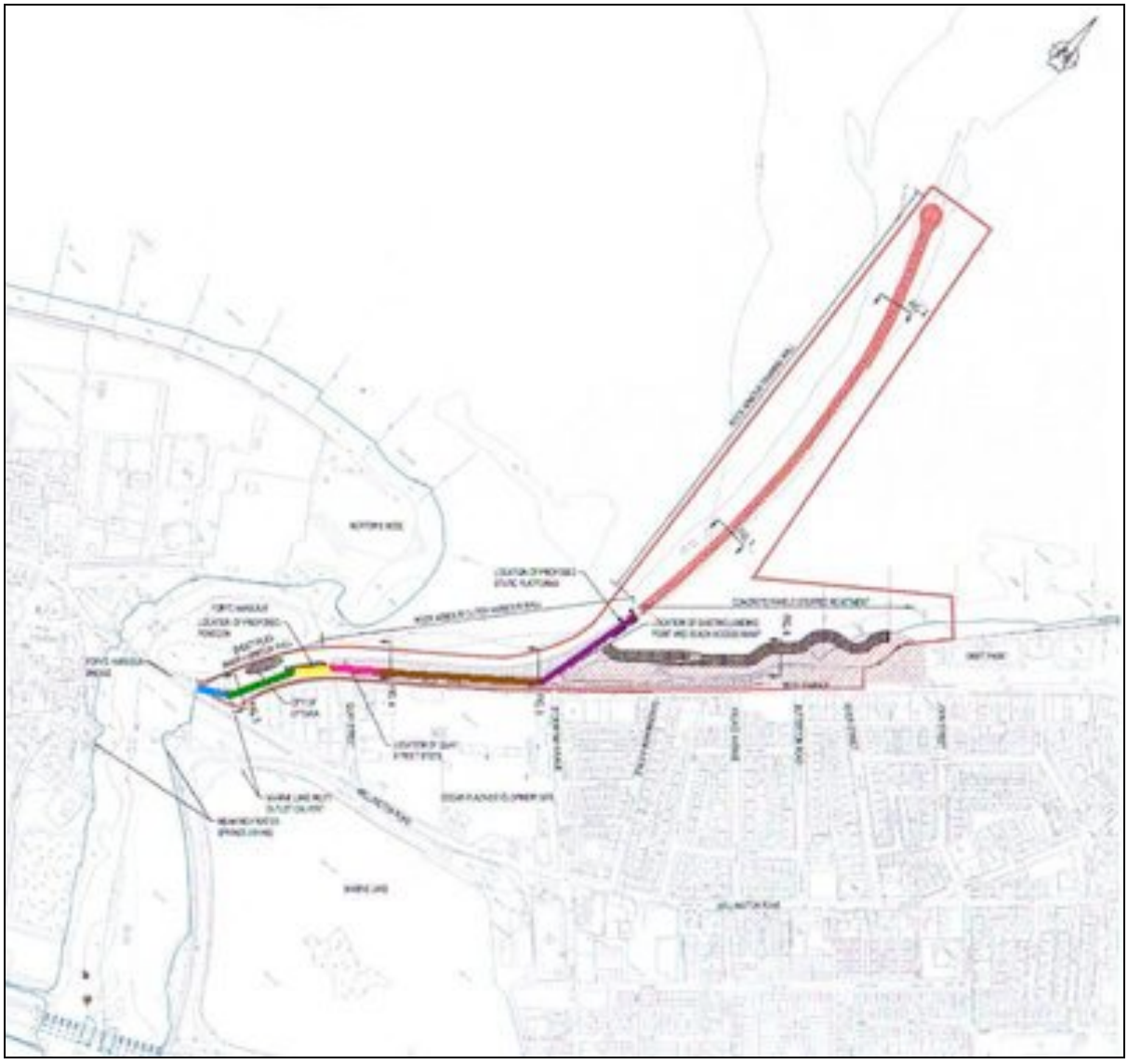

Figure 5. Location of study areas

5.2 Methodology

The objective of the watching brief action is to carry out a formal programme of archaeological observations and investigations during any operations on site that may disturb or destroy archaeological or architecturally informative deposits or remains. The specific aims of the work are to:

- Provide a record of those works associated with the removal of the topsoil
- Provide a record of any significant archaeological or architectural features encountered by intrusive activities

In order to achieve these objectives, a record of all archaeological informative deposits encountered during the ground operations were made consisting of detailed context records on individual pro-forma sheets and field drawings, according to the protocols set out in the GMA manual.

The ground-works were undertaken by hand under archaeological supervision. This action consisted of observation of the spoil removal and monitoring the displaced soil. Revealed sections were checked for any past cultural activity and if necessary recorded according to the protocols of the GMA manual.

The chief limitations facing the archaeological brief were

- Danger from incoming tides
- Wet and unstable mud flats and silts
- Unstable trenches collapsing from inundation
- A narrow working easement between the sea wall and the shore-line
- The radial arm of the excavating machine
- Hazardous petro-chemicals or effluent remaining within the silt

In order to maintain a safe working environment, it was advisable to remove the archaeologist from direct contact with these potential hazards.

The archaeologist was situated on the promenade and possessed a clear view of the ongoing works.

As deposits of potential interest emerged, then a pre-arranged signal with the driver was made via the site foreman in order to examine the bulk content. These deposits or artefacts were lifted by the machine and left in a safe location for further examination and documentation by the attendant archaeologist.

The archaeologist did not work unattended in the construction area, an area that was subject to deep excavation and comprised unstable ground.

In preparation for the presence of any putative ancient soil horizons, the following criteria were assessed before samples could be collected

- Depth of the trench
- Integrity of the trench sides
- Clear egress into the trench
- Rate of incoming water
- Integrity of the sample; whether it has been adulterated or there is extraneous material within

Utilising this methodology, it ensured that the archaeologist worked in a safe environment whilst undertaking their work within the “real-world” limitations of the construction programme.

5.3 Results

Section A

The area was stripped of its silt, a dark grey banded silt with possible organic material and hydro-carbons (grey shade, figure 6), between the eastern bridge abutment and to the west of an outfall pipe. As the silt probably contained effluent and petrol, its toxicity prevented close examination.

The accumulated material was up to 1.00m overlying a hard pebble beach (figure 7) with deposition occurring relatively recently as street furniture and other modern detritus was recovered.

No deposits pertaining to the wreck of the *City of Ottawa* or of any cultural antiquity were encountered, the area being archaeologically sterile.

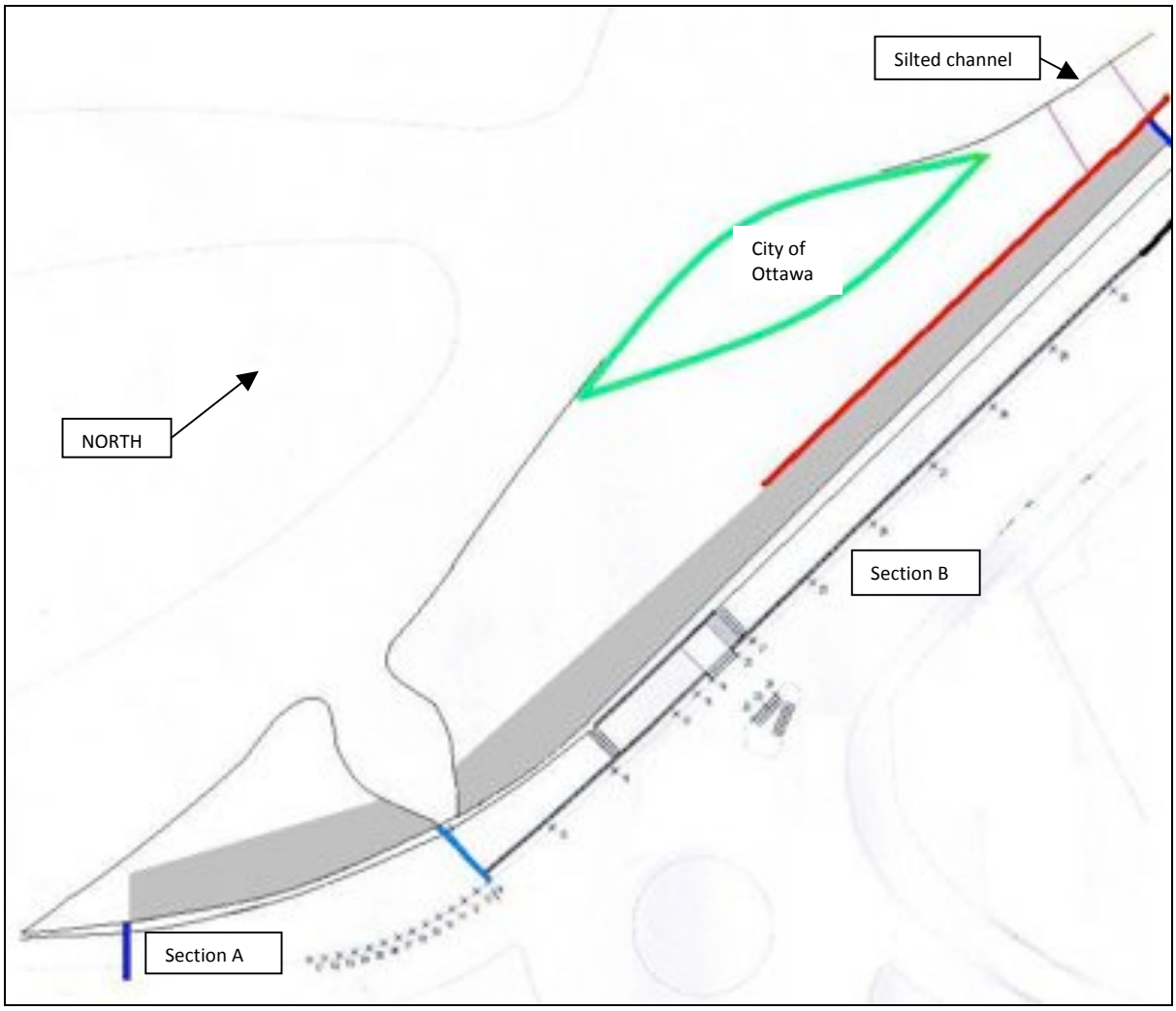

Figure 6. Plan of removed deposits in Areas A and B

Section B

The overburden (grey shade, figure 6) comprised modern silt containing oysters forming slurry to a depth of approximately 0.50m (figure 8). Within this material were modern traffic cones and other informally deposited detritus and street furniture.

Figure 7. Section A showing excavated silt

Figure 8. Silt removed western end of Section B

The slurry covered interleaving bands of grey and yellow sand (figure 9), the slurry accumulated since the arrival of the City of Ottawa, adjacent to the study area.

Figure 9. Section B, Overburden above beach

Figure 10. Section B, removing silt near the wreck

Probable remnants of the ships fittings were encountered, the result of chance loss whilst the hulk was stripped *circa* 1906. These included a cable that was sawn into a 0.84m length, a possible hand rail (figure 18) and a tube or pipe. Presumably, these artefacts were lost in the muddy confines of the beached hulk and were not deemed worthy of recovery by the breakers.

The natural topography and probably pre-1900 beach horizon was formed from coarse golden sand and gravel observed in the guide trench for the sheet piling (red outline, figure 6).

The abrasive qualities of this material and the effects of tidal scouring had reduced former beds of cockle shells to a desiccated lamina. This action indicated that the study area was a dynamic inter-tidal zone that consisted of fluvially lain sands and gravel and that any putative palaeo-environmental remains could not survive this action.

A small channel (figure 6) approximately 1.00m in depth and 4.00m in width possibly existed at the northern limit of area B. Filled by dark grey silt, this natural feature probably pre-dated the 1930s promenade.

The groundworks successfully avoided the extant wreck of the *City of Ottawa* leaving its remains *in situ* (figure 10) although a number of scattered and discarded artefacts attributable to the *City of Ottawa* were recovered. These artefacts are discussed below (section 5.4).

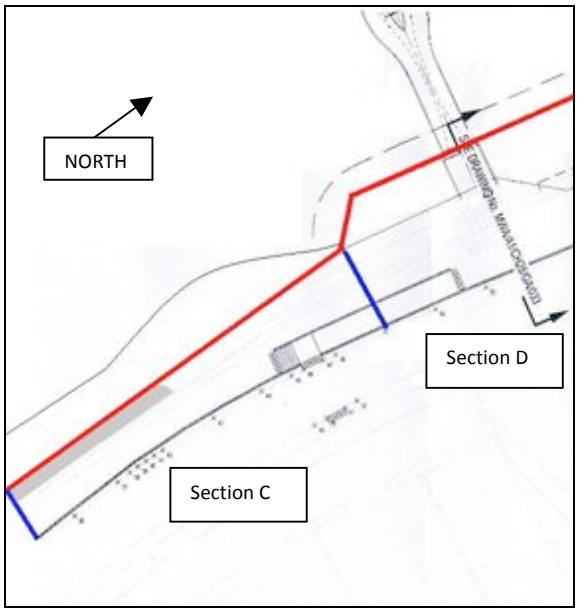

Figure 11. Section C

Section C

The silt encountered in Section B continued into the western portion of Section C (grey shade, figure 11). No cultural material of any antiquity was recovered from this deposit

The guidance trench for the sheet piling (red outline, figure 11) was excavated to a depth of approximately 1.50m. The trench rapidly collapsed and was inundated by water. Observations showed a shingle beach that developed into coarse, clean golden sand, probably part of a former sand bar (figure 12). No cultural activity was encountered although very occasional 19th century brick and 20th century concrete emerged probably the result of sinking into soft ground.

Figure 12. Section C, beach gravel

Figure 13. Section D, guide trench with gravel

Section D

As with Section C, the guidance trench for the sheet piling was excavated to a depth of approximately 1.50m (red outline, figure 14). The trench rapidly collapsed and was inundated by water. Observations showed a shingle beach that developed into coarse, clean golden sand probably part of an earlier sand bar (figure 13). No cultural activity was encountered although very occasional 19th century brick and 20th century concrete emerged probably the result of sinking into soft ground.

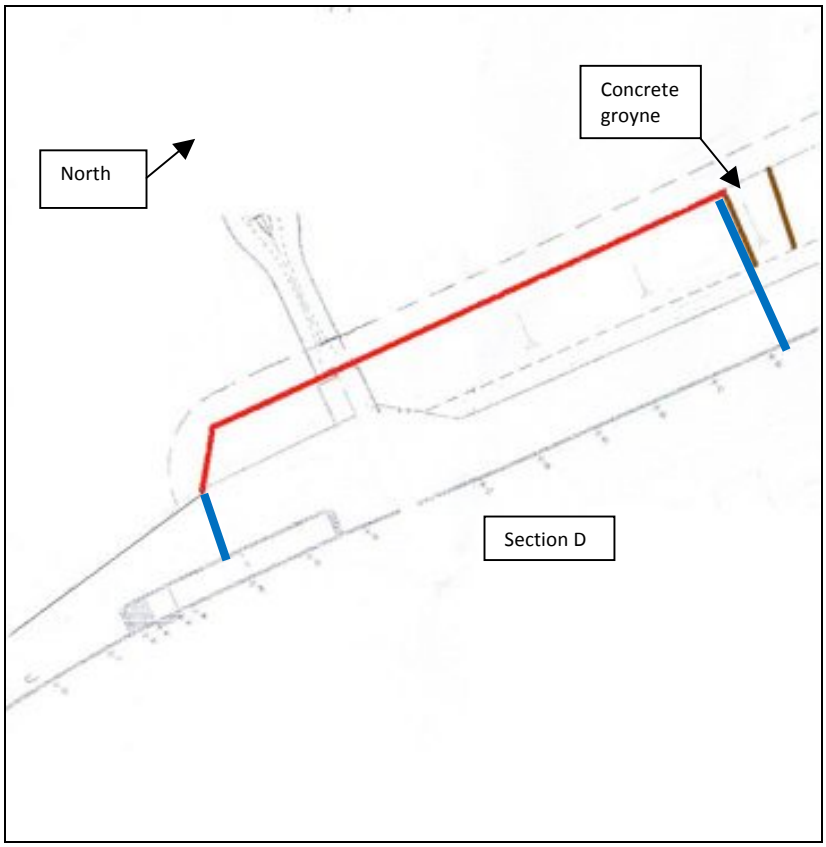

Figure 14. Section D

Figure 15. Section E

Figure 16. Section F

Section E

A minimal watching brief involving the excavation of a guidance trench (figure 15) was required for this area as it was clear from previous examination of the adjacent area that the location was archaeologically sterile.

Observations in this area confirmed the shingle beach encountered in Section D. No buried ancient ground surfaces were present.

Section F

A minimal watching brief involving the excavation of a guidance trench (figure 16) was required for this area as it was clear from previous examination of the adjacent area that the location was archaeologically sterile.

Observations in this area confirmed the shingle beach encountered in Section D. No buried ancient ground surfaces were present.

5.4 Finds

In Section B, the mechanical grab recovered a number of artefacts from the silt that are probably associated with the City of Ottawa although there remained no direct contact with the wreck.

These artefacts were given a brisk clean, photographed, documented and assessed for further examination.

As no precise provenance or secure identification could be afforded, there existed little purpose or merit with their continued curation.

The finds are listed below, identified by their photograph number.

- 59. A copper strip, 4.45m x 0.04m and 5mm in thickness bearing a bevelled profile (figure 17). There existed nail holes at 0.20m intervals. This item appears to be some form of banding possibly attached to the hull, but could be some form of finish to a wooden hand rail
- 60. An iron or steel cable, 0.84m in length and 22mm in diameter. At one end was a hexagonal nut 35mm in width whilst the other end was sawn indicating that the cable had been dismantled for salvage, this piece presumably lost in the mud as a chance loss.
- 61. A timber, 0.86m x 0.13m and 60mm in thickness. There was no sign of treatment to the wood e.g. dowelling, rebates, nails etc. The timber was hand-worked, possibly a ships rib
- 62. A bent cylindrical rail 1.81m x 35mm in diameter with flat discs 65mm in diameter at each terminal (figure 18). The disc terminals bore four screw holes that probably connected the rail to a mount
- 63. An iron bar, possibly cut at both ends, 1.37m x 20mm in diameter
- 64. Rectangular worked wooden post 2.30m x 0.25m and 200mm in thickness
- 69-71. A chain, probably part of a modern harbour anchor
- 72-74. An iron bar 2.30m x 40mm with a fitting at one end
- 83-89 and 101-102. A cast iron bar 1.71m x 50mm with a fitting at one end
- 90-94. Timber 0.92m x 0.14m bearing a worked plank attached to a post containing a square iron nail
- 95-98. Timber post, pile or log 0.54m x 0.18m
- 105-108. An iron pipe, 0.80m x 50mm in diameter
- 109-111. An pipe, 0.90m x 50mm in diameter
- 114-116. A worked timber 1.03m x 0.13m and 70mm in thickness
- 121-124. An iron spike 0.49m x 0.09m attached to another unidentified iron object, covered in accretion and rust
- 150-151. A timber beam fragment 1.40m x 0.15m and 100mm in thickness but with no evidence of joints

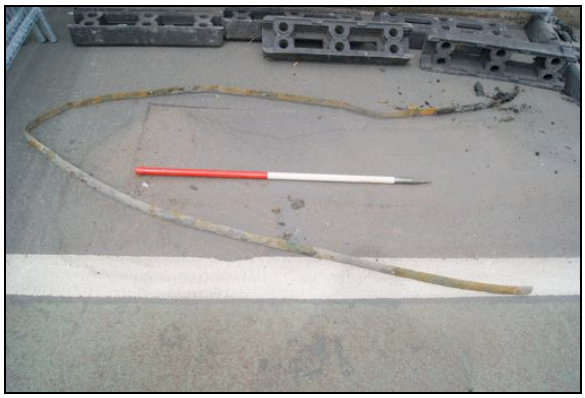

Figure 17. Copper banding (59)

Figure 18. Handrail (62)

5.5 Discussion

Based on the observations encountered, the study area appears to be archaeologically sterile apart from the proximity of the historic wreck, *City of Ottawa*.

The work undertaken during the watching brief is summarised in the following table.

SECTION	TASKS	COMMENTS	CONCLUSION
A	Removal of silt in order to establish finished level	Modern slurry and silt	Archaeologically sterile
B	Removal of silt in order to establish finished level	Chain uncovered and modern timber box abuts sea wall	Archaeologically sterile
B	Removal of silt in order to establish finished level	Brick and 19th to 20th C pottery recovered	Archaeologically sterile
B	Removal of silt in order to establish finished level	Possible robbed ships fittings	Archaeologically sterile
B	Removal of silt in order to establish finished level	Modern slurry and silt	Archaeologically sterile
C	Excavation of guide trench for sheet piles	Trench unstable, but cut modern silts and natural gravels	Archaeologically sterile
D	Excavation of guide trench for sheet piles	Trench unstable, but cut modern silts and natural gravels	Archaeologically sterile
E	Dumping of rock onto the beach	Minimal ground reduction, rock dumped	Archaeologically sterile
F	Dumping of rock onto the beach	Minimal ground reduction, rock dumped	Archaeologically sterile

Due to the tidal and deposition process it was apparent that stratigraphic security could not be achieved. Therefore, it is likely that cultural artefacts are liable to be *ex situ* and have limited value in assessing former land use and associated past cultural activity.

Clearance of silt has proven that a former past harbour facility is unlikely to exist whilst the existence of palaeo-environmental conditions associated with past human settlement, when sea-level was appreciably lower, either did not exist in this vicinity or that marine processes had transformed the local environment, leaving no trace of remote past human activity.

The wreck of the City of Ottawa was not been compromised by ongoing construction activity, its condition appearing to be currently stable albeit exposed to aerobic conditions.

6. ARCHIVE

The archive has been compiled in accordance with the project design and the guidelines set out by English Heritage (1991) and the Institute of Field Archaeologists (1994, 2001 and 2007).

The archive will be deposited with the local museum and a copy of the report donated to the County Sites and Monuments Record, as requested by the curatorial authority.

7. ACKNOWLEDGMENTS

I am grateful to Anne Thompson, the project co-ordinator and heritage consultant for her help and assistance with the brief and previous research undertaken by Gifford; Dylan Jones and Bill Fishwick, (Martin Wright Associates Ltd), the client for their collaboration and guidance on this project and to the ground workers in particular for their co-operation and tolerance.

Finally, I would like to thank Richard Woolley and Kate Griffiths for undertaking the watching brief stoically under variable weather conditions. Michael Castle assisted the fieldwork at short notice, whilst Gerry Martin conducted the watching brief for the first fortnight.

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