

REPORT

Lowestoft South Beach Coastal Protection Works Phase 2

Final Report

Client: Waveney District Council

Reference: I&B/PB1539/304514/R002/F03

Revision: 03/Final

Date: 14 September 2016



HASKONINGDHV UK LTD.

Rightwell House
 Rightwell East
 Bretton
 Peterborough
 PE3 8DW
 Industry & Buildings
 VAT registration number: 792428892
 +44 1733 334455 **T**
 +44 1733 262243 **F**
 royalhaskoningdhv.com **W**

Document title: Lowestoft South Beach Coastal Protection Works Phase 2

Document short title: Lowestoft South Beach Final Report
 Reference: I&B/PB1539/304514/R002/F03
 Revision: 03/Final
 Date: 14 September 2016
 Project name: Lowestoft South Beach Urgent Coastal
 Project number: PB1539
 Author(s): Victoria Cooper

Drafted by: Victoria Cooper

Checked by: Sarah Mounce

Date / initials: 02/06/16 / SM

Approved by: Tamzen Pope

Date / initials: 01/07/16 / TEP

Classification

Open

**Disclaimer**

No part of these specifications/printed matter may be reproduced and/or published by print, photocopy, microfilm or by any other means, without the prior written permission of HaskoningDHV UK Ltd.; nor may they be used, without such permission, for any purposes other than that for which they were produced. HaskoningDHV UK Ltd. accepts no responsibility or liability for these specifications/printed matter to any party other than the persons by whom it was commissioned and as concluded under that Appointment. The quality management system of HaskoningDHV UK Ltd. has been certified in accordance with ISO 9001, ISO 14001 and OHSAS 18001.

Executive Summary

The northern end of Lowestoft South Beach has been eroding slowly since around 2000 but from late 2012 the erosion rate increased. With the severe weather of winter 2013, even more damage was caused which led to plans being developed to protect the South Beach promenade and seawall from further storm damage. Phase 1 of the scheme, comprising the construction of a rock defence structure, was completed at the end of 2014. In 2015-16 Waveney District Council (WDC) carried out Phase 2 of the works which included a new vehicle access ramp, further rock structures on the beach, beach nourishment and the replacement of copings and repairs to the sea wall.

The Phase 2 works were subject to a programme of archaeological works set out in a Written Scheme of Investigation including:

- An archaeological watching brief to monitor the presence of any potential heritage assets (archaeological deposits/remains) during the enabling works prior to the construction of the detached T-Ramp rock structure;
- Exclusion zones to prevent damage to or disturbance of the wreck of the *Lily of Devon* and the Statues of Triton; and
- A finds reporting protocol to reduce any adverse effects on potential heritage assets by enabling contractors working on the Lowestoft South Beach Coastal Protection Works to report unexpected archaeological discoveries.

This document represents the final report setting out the results of archaeological mitigation carried out during the course of the works and demonstrating compliance with Planning (DC/15/0926/RG3) and Marine Licence (L/2014/00246/10) conditions.

Table of Contents

| | | |
|--|--|-----------|
| 1 | Project Background | 1 |
| 2 | Heritage Statement Summary | 1 |
| 3 | Consent Compliance | 4 |
| 4 | Results | 6 |
| 4.1 | Archaeological Exclusion Zones | 6 |
| 4.1.1 | Lily of Devon | 6 |
| 4.1.2 | Statues of Triton | 7 |
| 4.2 | Watching Brief | 8 |
| 4.3 | Reporting Protocol | 11 |
| 4.4 | Relocation of Signage | 12 |
| 4.5 | Geophysical Survey | 12 |
| 4.6 | Post-excavation Analysis and Reporting | 13 |
| 5 | Conclusion | 13 |
| 6 | References | 14 |
| Appendix A: Gazetteer of Suffolk Historic Environment Record and National Record of the Historic Environment Data | | 15 |

Table of Figures

| | |
|--|---|
| Figure 1: Site Location Plan | 2 |
| Figure 2: Historic Environment Records | 3 |

Table of Tables

| | |
|--|----|
| Plate 1: Wreck of the Lily of Devon | 6 |
| Plate 2: Installation of exclusion zone markers | 7 |
| Plate 3: Protection installed around Grade II Listed Statue of Triton (3) | 8 |
| Plate 4: Work Underway on Rock Structure 3 (SASCIC, 2015: Plate 6) | 9 |
| Plate 5: Work underway on Beach Access Ramp piling (SASCIC, 2015: Plate 8) | 10 |
| Plate 6: Shallow excavations in advance of Knuckle rock placement | 10 |
| Plate 7: Borrowing of beach material from the causeway donor area, on the north side of Claremont Pier | 12 |
| Plate 8: Completed works and location of new public warning sign | 13 |

1 Project Background

The northern end of Lowestoft South Beach has been eroding slowly since around 2000 but from late 2012 the erosion rate increased. With the severe weather of winter 2013, even more damage was caused which led to plans being developed to protect the South Beach promenade and seawall from further storm damage. Phase 1 of the scheme, comprising the construction of a rock defence structure, was completed at the end of 2014. In 2015-16 Waveney District Council (WDC) carried out Phase 2 of the works which included:

- A new vehicle access ramp at Children's Corner;
- Rock structures on the beach to protect the seawall from damage and also create and sustain a modest amenity beach;
- Beach nourishment;
- New pedestrian guard railing; and
- Replacement of copings and repairs to the Flint Wall.

A Heritage Statement was prepared by Royal HaskoningDHV (2015a) in order to consider the impact of the proposed Phase 2 works and measures to address these potential impacts were agreed in consultation with Historic England and Suffolk County Council and set out in a Written Scheme of Investigation (WSI) (Royal HaskoningDHV, 2015b).

This document represents the final report setting out the results of archaeological mitigation carried out during the course of the works.

2 Heritage Statement Summary

The area of proposed coastal protection works is located along the northern stretch of South Beach (known as Children's Corner) towards South Pier in South Lowestoft, East Suffolk, and centred on National Grid Reference 654930 292520. The coastal town of Lowestoft is 19km from Great Yarmouth and 35km from Norwich (**Figure 1**).

The proposed breakwaters (rock structures) are located on a sand and shingle beach within the inter-tidal zone at a minimum elevation of -1.36m above Ordnance Datum (aOD) and a maximum elevation of -0.44m aOD. The Esplanade, which forms the north-western boundary of the site, is recorded at an approximate height of +4.5m aOD and is predominantly flat.

The Heritage Statement (Royal HaskoningDHV, 2015a) examined the archaeological interest of a study area comprising a 500m area extending out from the site boundary (**Figure 1** and **Figure 2**). A total of 39 records of heritage assets were identified, as listed in the gazetteer (**Appendix A**) and shown on **Figure 2**. None of these lay directly within the footprint of the coastal protection works although the proposed works were considered likely to have a non-physical, temporary impact on the historic integrity and setting of heritage assets located along and adjacent to the site:

- Royal Norfolk and Suffolk Yacht Club (**1**);
- Statues of Triton (**3** and **4**);
- South Lowestoft Conservation Area (**12**); and
- Lily of Devon (**23/24**).



Legend:

- Location of Proposed Coastal Protection Works
- - - 500m Study Area

© Haskoning UK Ltd. Contains Ordnance Survey data
© Crown copyright and database right 2015

| | |
|--------------------------|---|
| Client: | Project: |
| Waveney District Council | Lowestoft South Beach Urgent Coast Protection Works Phase 2 |

Title:

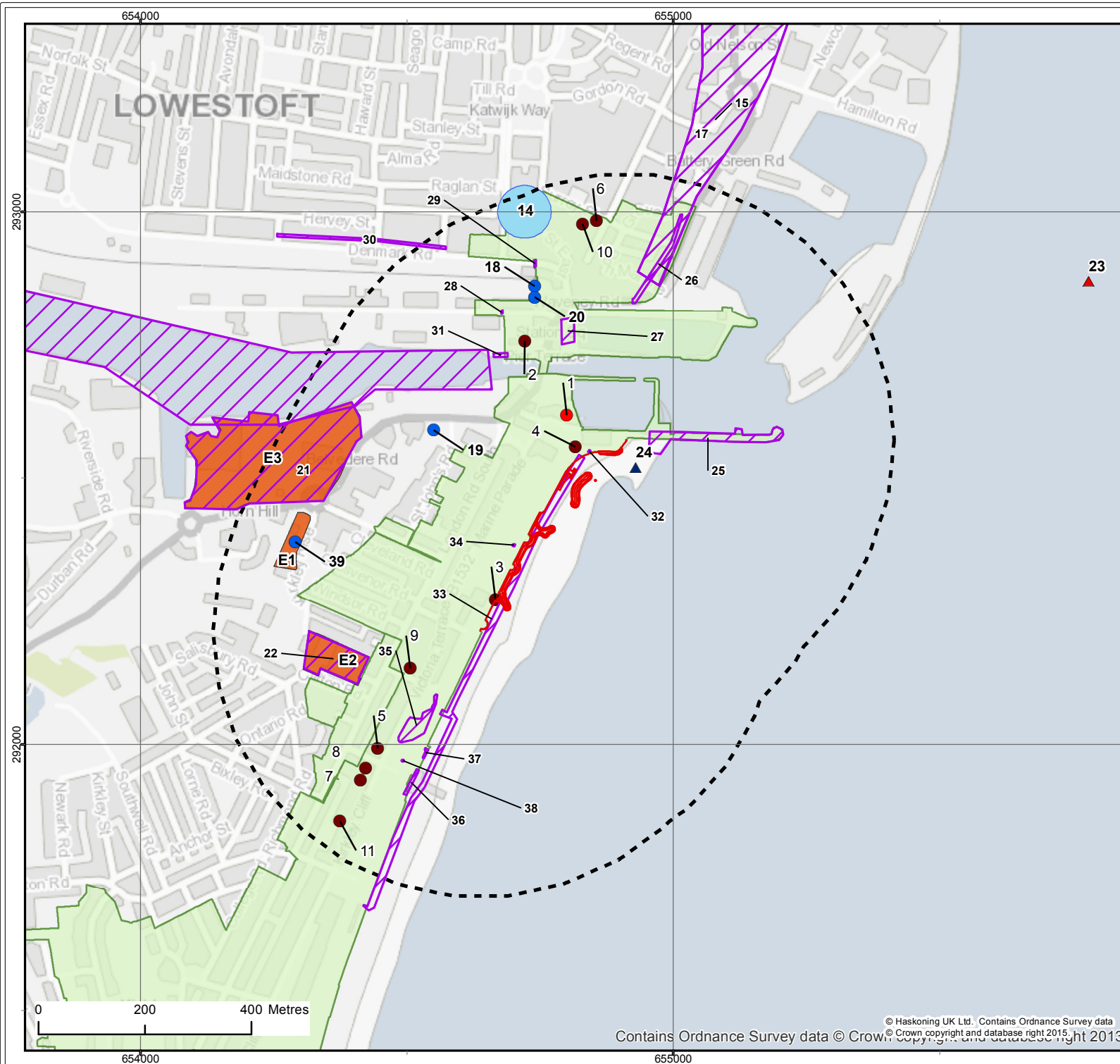
Site Location Plan

| | | | | | | |
|-----------|------------|-------------|----------------|-------|----------|--|
| Figure: | 1 | Drawing No: | PB1539-101-001 | | | |
| Revision: | Date: | Drawn: | Checked: | Size: | Scale: | |
| 01 | 27/02/2015 | JE | SM | A4 | 1:10,000 | |

Co-ordinate system: British National Grid

 **Royal HaskoningDHV**
Enhancing Society Together

ROYAL HASKONINGDHV
COASTAL & MARINE ENVIRONMENT
2 ABBEY GARDENS
GREAT COLLEGE STREET
WESTMINSTER
LONDON
SW1P 3NL
+44 (0)20 7222 2115
www.royalhaskoningdhv.com



Legend:

- Location of Proposed Coastal Protection Works
- 500m Study Area
- Grade II* Listed Buildings
- Grade II Listed Buildings
- Conservation Area
- ▲ Lily of Devon (Report of Loss)
- ▲ Wreck Remains
- HER Monuments (Point)
- HER Monuments (Area)
- HER Find Spot
- HER Investigation

Client:

**Waveney District
Council**

Project:

**Lowestoft South Beach
Urgent Coast Protection
Works Phase 2**

Title:

Historic Environment Records

Figure: 2

Drawing No: PB1539-101-002

| Revision: | Date: | Drawn: | Checked: | Size: | Scale: |
|-----------|------------|--------|----------|-------|----------|
| 01 | 27/02/2015 | JE | SM | A4 | 1:10,000 |

Co-ordinate system: British National Grid

 **Royal
HaskoningDHV**
Enhancing Society Together

ROYAL HASKONINGDHV
COASTAL & MARINE ENVIRONMENT
2 ABBEY GARDENS
GREAT COLLEGE STREET
WESTMINSTER
LONDON
SW1P 3NL
+44 (0)20 7222 2115
www.royalhaskoningdhv.com

The construction phase was also considered likely to have a non-physical, temporary impact upon the setting of Royal Plain, Royal Green, the Esplanade and Marine Parade. It was concluded, however, that the coastal works would have an overall beneficial impact upon the built heritage and Conservation Area, through the reduced risk of flooding and erosion, thereby maintaining their historic integrity and setting for continued public enjoyment, use and understanding.

Although none of the identified records were located within the footprint, the close proximity of two heritage assets required further consideration. The site of the *Lily of Devon* (**23/24**), located approximately 19m from the nearest proposed breakwater (the detached T-Ramp structure), and a Grade II Listed Statue of Triton (**3**) adjacent to the sea wall were considered to be at risk from accidental damage from machine movements, including the offloading of the armour stone from the transshipment barge.

A further impact was the potential for anchorage and transshipment activities to directly impact any heritage assets on the seabed that may be present within the offshore transshipment area, if contact with the seabed occurs (e.g. vessel anchors or accidental loss of cargo).

With regard to potential sub-surface archaeology that may be present beneath the surficial beach sands, the Heritage Statement concluded that, due to the shallow depths of excavations, potential impacts to buried archaeological material were expected to be low. Potential impacts from piling works associated with the new access ramp were also expected to be low.

The main development and expansion within the study area took place in the mid to late 19th century with a number of the identified records relating to heritage assets of WWII date. Historic mapping shows that the site has long existed as a beach with sand dunes and open land to the west, prior to the mid-19th century development.

Although there was no known evidence of prehistoric activity within the study area, the close proximity of the site to Pakefield and other sites suggested that there could be potential for buried deposits of prehistoric date. Pakefield is a site of national archaeological importance with the discovery of flint tools dated to 700,000 years Before Present (BP) at a site c. 2.5km to the south of Lowestoft (Parfitt *et al*, 2005). The potential for uncovering evidence of Roman, Saxon and medieval activity within the site was expected to be limited considering the 19th century development of this area. The Heritage Statement suggested however that there could be potential for uncovering further evidence of the mid-19th century expansion, WWII defences and other modern activities within the site.

Mitigation measures for these potential impacts were agreed in consultation with Historic England and Suffolk County Council and set out in the project WSI as described in **Section 3** below (Royal HaskoningDHV, 2015b).

3 Consent Compliance

Conditions of planning permission (DC/15/0926/RG3) and the Marine Licence (L/2014/00246/10) for works were as follows:

- Planning Condition 4: No development shall take place within the area indicated [the whole site] until the implementation of a programme of archaeological works has been secured, in accordance with a Written Scheme of Investigation which has been submitted to and approved in writing by the Local Planning Authority. The scheme of investigation shall include an assessment of significance and research questions; and:
 - a) The programme and methodology of site investigation and recording

- b) The programme for post investigation assessment
 - c) Provision to be made for analysis of the site investigation and recording
 - d) Provision to be made for publication and dissemination of the analysis and records of the site investigation
 - e) Nomination of a competent person or persons/organisation to undertake the works set out within the Written Scheme of Investigation
 - f) The site investigation shall be completed prior to development, or in such other phased arrangement, as agreed and approved in writing by the Local Planning authority.
- Planning Condition 5: Following the completion of on-site archaeological investigation and recording the application must secure the implementation of a programme of post excavation work, in accordance with a written scheme or post excavation works, which has been submitted by the applicant and approved by the Planning Authority. The programme will comprise an archive of the records and finds, an assessment of the importance of the results and, when appropriate, more detailed analysis and publication of the results;
 - Marine Licence Condition 5.2.16: The licence holder must ensure that a 10m exclusion zone for all works is maintained and clearly marked around the *Lilly of Devon* wreck as indicated in schedule 14 of this marine licence;
 - Marine Licence Condition 5.2.17: The licence holder must undertake a programme of archaeological monitoring during the development of ground reductions for the installation of the rock armour. A report must be submitted to the MMO one month after completions of the works; and
 - Marine Licence Condition 5.2.18: The licence holder must submit a programme of archaeological works in accordance with the written scheme of investigation for approval to the MMO prior to the commencement of any works. Reason: To ensure that the risk to heritage features is kept to a minimum.

In compliance with Planning Permission Condition 4 a WSI for the project was prepared in consultation with Historic England (Nick Carter, Assistant Inspector of Ancient Monuments (Bedfordshire, Norfolk and Suffolk)) and Suffolk County Council (Richard Hoggett, Senior Archaeological Officer). Details of the consultation process are set out in the WSI document. Following consultation with the MMO (Paul Kirk, Marine Licensing Case Officer) the WSI was also submitted as the programme of archaeological works in compliance with Condition 5.2.18 of the Marine Licence.

The final WSI was submitted to all parties via email 5th June 2015. Written approval for the WSI was received via email from Nick Carter and Richard Hoggett on 8th June 2015. The Planning Condition was also discharged by WDC on 8th June 2015 (reference DC/15/2340/DRC).

The WSI prepared by Royal HaskoningDHV (2015b) set out the scheme of investigations for the following agreed mitigation measures:

- archaeological watching brief to monitor the presence of any potential heritage assets (archaeological deposits/remains) during the enabling works prior to the construction of the detached T-Ramp rock structure;
- exclusion zones to prevent damage to or disturbance of the wreck of the *Lilly of Devon* and the Statues of Triton; and
- a finds reporting protocol to reduce any adverse effects on potential heritage assets by enabling contractors working on the Lowestoft South Beach Coastal Protection Works to report unexpected archaeological discoveries.

The WSI and an outline of the contractors responsibilities to become familiar with and apply all elements of the WSI, including the archaeological protocol, was communicated to the contractor, J T Mackley and Company Ltd (Mackley), by WDC via an Employer's Instruction dated 19th June 2015.

The exclusion zone around the *Lily of Devon* (in compliance with Marine Licence Condition 5.2.16) is detailed in **Section 4.1** below.

The results of the programme of archaeological monitoring (in compliance with Marine Licence Condition 5.2.17 and Planning Condition 4-f) are detailed in **Section 4.2** below.

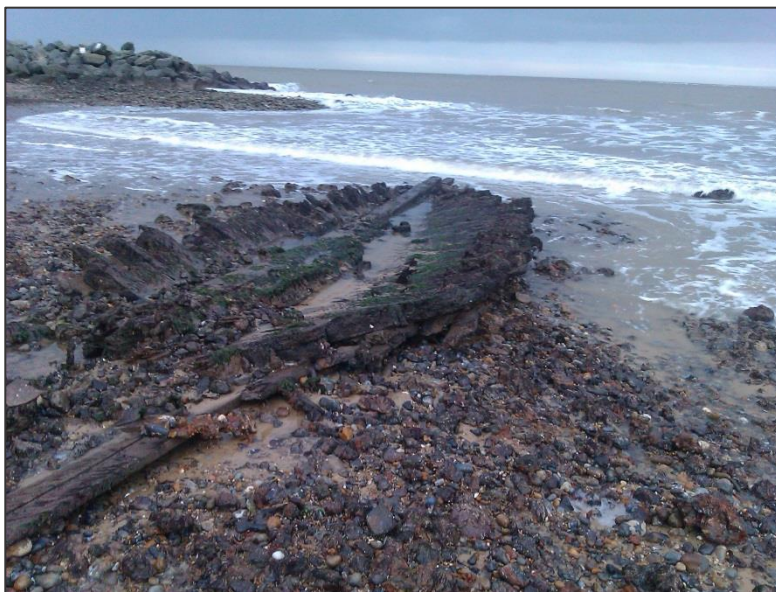
4 Results

4.1 Archaeological Exclusion Zones

4.1.1 Lily of Devon

Prior to works commencing a 10m exclusion zone was established around the wreck of the *Lily of Devon* within which all construction works and machine or vessel movements were strictly prohibited, to prevent damage to the remains during works.

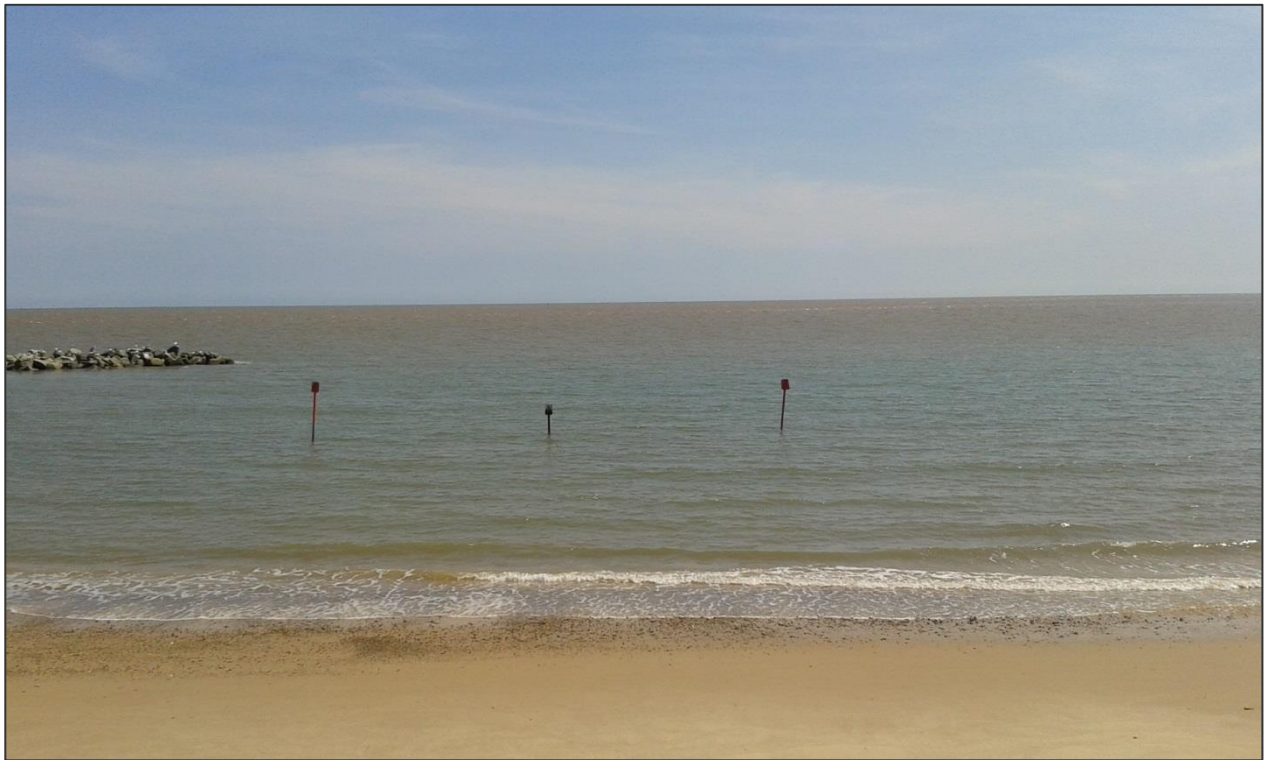
Plate 1: Wreck of the *Lily of Devon*



The exclusion zone was marked on site plans and the need to observe the exclusion zone was communicated to the contractor via an Employer's Instruction from WDC to Mackley dated 19th June 2015.

The position of the prow of the *Lily of Devon* was marked by a previously installed marker post (**Plate 1**). In advance of the works commencing, Mackley marked out the extent of the exclusion zone on site using posts encased in precast concrete manhole rings (**Plate 2**). This technique allowed for the markers to be visible at all states of the tide without the need to attach anything to the wreck.

Plate 2: Installation of exclusion zone markers



Due to this increased visibility and commitment by the contractor to observe the exclusion zone there were no reported transgressions of the boundary and no reported damage to the *Lily of Devon* during works.

Following the completion of works the marker posts were removed and new public signage installed (see **Section 4.4**).

4.1.2 Statues of Triton

The WSI also required both statues of Triton to have a 5m exclusion zone. Statue 4 was located beyond the site boundary within the public area of the beach front and exclusion zone markers were, therefore, not required. No works or machine movements were carried out in the vicinity of this statue.

The exclusion zone for statue **3** was marked on site plans and the need to observe the exclusion zone was communicated to the contractor via an Employer's Instruction from WDC to Mackley dated 19th June 2015.

Although the statue was located on the sea wall and not in the footprint of the works, in order to increase visibility and to protect the statue from accidental damage during works scaffolding was placed around the statue with boarding on the landward side (Plate 3). In addition, the statue was located within the heras fenced boundary of the site.

Plate 3: Protection installed around Grade II Listed Statue of Triton (3)



No damage was reported to either statue during the programme of works.

4.2 Watching Brief

Archaeological monitoring was undertaken by Suffolk Archaeology Community Interest Company (SACIC) during July and August 2015 (SACIC, 2015).

Monitoring comprised visual examination of the beach reduction works and any other substantial excavations. Due to much of the work being carried out by 50t machines operating at or below the high water mark at all states of the tide, the opportunity to positively identify archaeological evidence during the

works was limited. Due to practical considerations, therefore, works were intermittently monitored and the site was visited on the 20th, 22nd, 29th July 2015 and the 6th and 10th August 2015 in order to monitor the works underway.

During site visits, work relating to the construction of the Rock Structures (**Plate 4**) and works relating to the piling operations for the new beach access ramp (**Plate 5**) were observed. Where activities were undertaken below the high water, spoil was observed as it was tipped from the machine bucket.

During monitoring visits, only reworked beach sands and shingle deposits were observed (e.g. **Plate 6**) and no archaeological remains were identified. No artefacts were discovered and no features or deposits of archaeological potential were identified. It was noted that had any substantial archaeological evidence been present, such as a wreck site, it would have been readily apparent.

Plate 4: Work Underway on Rock Structure 3 (SASCIC, 2015: Plate 6)



The archaeological monitoring report produced by SACIC (2015) was forwarded via email to Richard Hoggett on 3rd September 2015.

The site archive was sent by SACIC to the County Historical Environment Record, under the HER reference LWT 336, and a summary of this project was entered into OASIS, the online database, under the reference: suffolka1-218225.

Confirmation that the OASIS report had been received and that the data would be migrated into the Suffolk HER was received from Richard Hoggett on 4th September 2015.

Plate 5: Work underway on Beach Access Ramp piling (SACIC, 2015: Plate 8).



Plate 6: Shallow excavations in advance of Knuckle rock placement



4.3 Reporting Protocol

A reporting protocol for the project was provided as Appendix B of the WSI (Royal HaskoningDHV, 2015b).

A toolbox talk was undertaken by Royal HaskoningDHV (Victoria Cooper, Senior Marine Heritage Consultant) on 16th July 2015. The talk took place on site to key WDC staff and site contractors and covered the following topics:

- The principal objectives of the protocol;
- Where discoveries might be encountered (on the seabed anchorage and approaches, within beach deposits);
- What discoveries might be encountered (prehistoric, maritime and aviation);
- The roles and responsibilities of named individuals (site champion, nominated contact, protocol archaeologist) and all those on site with regard to the effective implementation of the protocol;
- How to deal with discoveries (first aid, initial recording and reporting protocol);
- Timescales for reporting; and
- Useful web resources for further information.

A hard copy folder was left on site including:

- A3 copies of the toolbox talk presentation;
- A hard copy of the protocol document;
- Reporting forms to use in the event of a discovery;
- Additional information on first aid for finds and initial recording requirements; and
- Contact details for named individuals.

No archaeological discoveries were made during the course of the works.

As described above, during their programme of on-site monitoring, SACIC (2015) observed the works and the potential for finds to be encountered and at no time were any archaeological remains identified. The finds reporting protocol was in place but no artefacts worthy of further investigation were reported by the machine operators. SACIC concluded that while it was possible that the machine operators could have missed small artefacts, any substantial archaeological evidence would have been readily apparent.

On 16th July 2015, works to borrow sand for causeway construction were also observed by Royal HaskoningDHV (**Plate 7**). The Heritage Statement (Royal HaskoningDHV, 2015a) had previously concluded that these works were unlikely to impact buried archaeological deposits. In accordance with this conclusion, only reworked sand deposits were seen and no artefacts or features of archaeological interest were identified.

Plate 7: Borrowing of beach material from the causeway donor area, on the north side of Claremont Pier



4.4 Relocation of Signage

In addition to the above activities, works were also undertaken to replace the permanent public warning marker for the *Lily of Devon* (Activity 3.11 of the Marine Licence). The methodology comprised the selection of an accessible siting location for the sign off the northern end of the new rock 'reef' where the seabed is exposed on spring low tide and well clear of the actual wreck remains. A pit was excavated using a mechanical excavator, the sign (set on a post within a concrete filled barrel base) was set in the pit, which was then backfilled and beach levels reinstated.

The location of the new sign is shown in **Plate 8**.

4.5 Geophysical Survey

In their response to the marine licence application, Historic England specified that a sidescan sonar survey would be required for all new anchorage locations to determine potential receptors on the seabed which could be impacted by anchors, moorings or rock falls.

Prior to Phase 1 works commencing sidescan sonar surveys were undertaken at the Anchorage at Hopton on 12th April, 2014, 3rd to 4th May 2014 and 1st to 2nd September 2014 by Channel Surveys Limited (Pearce, 2015). Pre-planned survey lines were followed to provide 200% (nominal) seabed coverage. The sidescan sonar plots from the three surveys were examined and no potential receptors were identified (Royal HaskoningDHV, 2015b). As no new anchorages were to be utilised for Phase 2 with the same transshipment area as for Phase 1, further sidescan sonar survey was not required.

Following Phase 2, two high resolution multi beam surveys were carried out with the purpose of identifying any significant obstacles (dropped rock armour pieces) on the seabed that may have been deposited during the rock transshipment period (Channel Surveys Limited, 2016). No new significant obstacles of

similar size to the material being transhipped and relevant to the licence conditions were identified during the June 2016 post works survey. As there were no new anchorages or moorings, and as there were no rock falls during transhipment, this data demonstrates that impacts to potential receptors on the seabed as a result of Phase 2 did not occur.

Plate 8: Completed works and location of new public warning sign



4.6 Post-excavation Analysis and Reporting

As no archaeological remains were identified during the course of the works there was no requirement for a programme of post-excavation work.

In compliance with Planning Condition 5 (post-excavation and archive) the archive for the project comprises the SACIC (2015) monitoring report and this final report. Both reports have been made publically available through submission to the Suffolk HER (reference LWT 336) and through OASIS (suffolka1-218225 and royalhas1-253710).

5 Conclusion

The Lowestoft South Beach Coastal Protection Works Phase 2 were subject to a programme of archaeological works set out in a WSI in compliance with Planning (DC/15/0926/RG3) and Marine Licence (L/2014/00246/10) conditions described in **Section 3**.

With respect to archaeology and the historic environment, Planning Conditions and Marine Licence Conditions have been addressed through the preparation and agreement of a WSI for works and a programme of archaeological monitoring.

Planning Condition 4, and Marine Licence Condition 5.2.18, (the WSI) was discharged by WDC 8th June 2015 (reference DC/15/2340/DRC). In accordance with the WSI and with Marine Licence Condition 5.2.17, a programme of archaeological monitoring during the development of ground reductions for the installation of the rock armour was undertaken. In addition, a 10m exclusion zone was maintained and

clearly marked around the *Lilly of Devon* wreck for all works (Marine Licence Condition 5.2.16). Protection was also provided for the Grade II Listed Statue of Triton located on the South Beach promenade.

No archaeological features, deposits or artefacts were identified during monitoring by SACIC (2015) or through the finds reporting protocol implemented on site throughout the works. As such, further post-excavation analysis or reporting is not required (Planning Condition 5).

The monitoring report (SACIC, 2015) and this final project report have been submitted to OASIS and form the archive for the project.

6 References

Channel Surveys Limited (2016) Hopton on Sea and Lowestoft coast protection rock delivery Pre and Post works transshipment area side scan investigation Unpublished Report Ref: MMO Licence no L/2014/00246/10.

Parfitt, S.A. Barendregt, R.W. Breda, M. Candy, I. Collins, M.J. Coope, G.R. Durbidge, P. Field, M.H. Lee, J.R. Lister, A.M. Much, R. Penkman, K.E.H. Preece, R.C. Rose, J. Stringer, C.B. Symmons, R. Whittaker, J.E. Wymer J.J. and Stuart, A.J. (2005) The earliest record of human activity in northern Europe, *Nature* 438, 1008-1012.

Pearce, S R (2015) Hopton on Sea and Lowestoft Coast Protection Rock Delivery Pre and Post works transshipment areas side scan/multi beam investigation. Channel Surveys Limited, Unpublished Report.

Royal HaskoningDHV (2015a) Lowestoft South Beach Urgent Coastal Protection Works Phase 2: Heritage Statement. Unpublished Report Ref: PB1539/R1/304408/Lond.

Royal HaskoningDHV (2015a) Lowestoft South Beach Urgent Coastal Protection Works Phase 2 Archaeological Written Scheme of Investigation. Unpublished Report Ref: PB1539/R/304514/Lond.

Suffolk Archaeology (2015) South Beach Urgent Coastal Protection Works Phase 2, Lowestoft, Suffolk. Archaeological Monitoring Report. Unpublished Report Ref: SACIC Report No. 2015/062.

Appendix A: Gazetteer of Suffolk Historic Environment Record and National Record of the Historic Environment Data

| RHDHV ID No. | HER Ref No. | NRHE Ref No. | Easting | Northing | Record Type | Monument Type | Monument Name | Period |
|--------------|-------------|--------------|---------|----------|-------------------|------------------|--|------------------------------|
| 1 | DSF12721 | | 654800 | 292618 | LISTED BUILDING | Grade II* | ROYAL NORFOLK AND SUFFOLK YACHT CLUB | 1902 to 1903 |
| 2 | DSF13038 | | 654721 | 292758 | LISTED BUILDING | Grade II | PORT HOUSE | 1831 |
| 3 | DSF12725 | | 654666 | 292272 | LISTED BUILDING | Grade II | STATUE OF TRITON | 1849 |
| 4 | DSF12745 | | 654816 | 292559 | LISTED BUILDING | Grade II | STATUE OF TRITON | 1849 |
| 5 | DSF12726 | | 654445 | 291993 | LISTED BUILDING | Grade II | WELLINGTON ESPLANADE | 1852 to 1853 |
| 6 | DSF13064 | | 654856 | 292983 | LISTED BUILDING | Grade II | NATIONAL WESTMINSTER BANK | 1860 to 1869 |
| 7 | DSF13062 | | 654413 | 291933 | LISTED BUILDING | Grade II | SOUTH LODGE | 1864 |
| 8 | DSF12713 | | 654422 | 291956 | LISTED BUILDING | Grade II | ASHURST | 1864 |
| 9 | DSF13026 | | 654506 | 292143 | LISTED BUILDING | Grade II | No name | 1869 |
| 10 | DSF13035 | | 654830 | 292977 | LISTED BUILDING | Grade II | POST OFFICE | 1867 to 1899 |
| 11 | DSF12739 | | 654374 | 291856 | LISTED BUILDING | Grade II | KIRKLEY CLIFF TERRACE | 1870 |
| 12 | WA12 | | | | CONSERVATION AREA | | South Lowestoft Conservation Area | |
| 13 | WA07 | | | | CONSERVATION AREA | | London Road South Commercial Conservation Area | |
| 14 | MSF1699 | | 654750 | 293050 | MON | ARTEFACT SCATTER | 108 Bevan Street | Roman |
| 15 | MSF18346 | | 655150 | 293750 | MON | TOWN, MARKET | Medieval town core | 14th century to 16th century |
| 16 | MSF22506 | | 652727 | 292969 | MON | PEAT CUTTING | Lake Lothing | Medieval |

| RHDHV ID No. | HER Ref No. | NRHE Ref No. | Easting | Northing | Record Type | Monument Type | Monument Name | Period |
|--------------|-------------|--------------|---------|----------|------------------|--|--|-------------------------|
| 17 | MSF18347 | | 655150 | 293750 | MON | TOWN | Post-medieval town core | Post Medieval |
| 18 | MSF29727 | | 654740 | 292860 | Allocated number | | Outline Record: Railway Station | Post-medieval |
| 19 | MSF29728 | | 654550 | 292590 | Allocated number | | Outline Record: Former RR Line at South Quay | Post-medieval |
| 20 | MSF29729 | | 654740 | 292840 | Allocated number | | Outline Record: Former Herring Basin Line | Post-medieval |
| 21 | MSF23807 | | 654249 | 292542 | MON | BUILDING, CRANE | Former Crown Works ship building and engineering site in Lowestoft | Post Medieval to Modern |
| 22 | MSF25142 | | 654367 | 292163 | MAR | DITCH, PIT, WINDMILL, CHURCH | Land off Clifton Road, Lowestoft; St Matthews Church | Post Medieval to Modern |
| 23 | | 1543665 | 655780 | 292870 | | Smack | <i>Lily of Devon</i> | Modern |
| 24 | | 1543673 | 654930 | 292520 | | Wreck | Monument No. 1543673 | Modern |
| 25 | MSF27615 | | 655080 | 292571 | MON | COASTAL BATTERY | South Pier Battery | WWII |
| 26 | MXS19139 | | 654980 | 292912 | MON | ROADBLOCK | Three World War II road blocks | WWII |
| 27 | MXS19140 | | 654802 | 292777 | MON | BARRAGE BALLOON CENTRE | World War II barrage balloon centre | WWII |
| 28 | MXS19141 | | 654678 | 292812 | MON | ROADBLOCK | World War II road block | WWII |
| 29 | MXS19142 | | 654741 | 292903 | MON | ROADBLOCK | World War II road block | WWII |
| 30 | MXS19143 | | 654470 | 292944 | MON | ROADBLOCK | Three World War II road blocks | WWII |
| 31 | MXS19147 | | 654676 | 292731 | MON | AIR RAID SHELTER | World War II air raid shelter | WWII |
| 32 | MXS19148 | | 654843 | 292550 | MON | PILLBOX | World War II pillbox | WWII |
| 33 | MXS19149 | | 654606 | 292116 | MON | BEACH DEFENCE | Length of World War II beach defence scaffolding | WWII |
| 34 | MXS19150 | | 654700 | 292374 | MON | GUN EMPLACEMENT? | Possible World War II gun emplacement | WWII |
| 35 | MXS19151 | | 654509 | 292049 | MON | PILLBOX?, TRENCH, BARRAGE BALLOON SITE | World War II barrage balloon site and trenches | WWII |

| RHDHV ID No. | HER Ref No. | NRHE Ref No. | Easting | Northing | Record Type | Monument Type | Monument Name | Period |
|--------------|-------------|--------------|---------|----------|------------------|----------------------|--|---------|
| 36 | MXS19152 | | 654508 | 291929 | MON | SLIT TRENCH, PILLBOX | World War II slit trench and pillbox | WWII |
| 37 | MXS19153 | | 654535 | 291983 | MON | TANK TRAP | World War II anti-tank cubes | WWII |
| 38 | MXS19154 | | 654492 | 291969 | MON | GUN EMPLACEMENT? | Possible World War II gun emplacement | WWII |
| 39 | MSF29739 | | 654290 | 292380 | Allocated number | | Outline Record: Horn Hill Lowestoft/ Kirkley Drive | Undated |



With its headquarters in Amersfoort, The Netherlands, Royal HaskoningDHV is an independent, international project management, engineering and consultancy service provider. Ranking globally in the top 10 of independently owned, nonlisted companies and top 40 overall, the Company's 6,500 staff provide services across the world from more than 100 offices in over 35 countries.

Our connections

Innovation is a collaborative process, which is why Royal HaskoningDHV works in association with clients, project partners, universities, government agencies, NGOs and many other organisations to develop and introduce new ways of living and working to enhance society together, now and in the future.

Memberships

Royal HaskoningDHV is a member of the recognised engineering and environmental bodies in those countries where it has a permanent office base.

All Royal HaskoningDHV consultants, architects and engineers are members of their individual branch organisations in their various countries.