



C263 LATE EAST  
Interim Statement  
Non-listed Built Heritage Recording  
Connaught Tunnel

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## Contents

<b>1 Introduction .....</b>	<b>4</b>
<b>2 Site Methodology and fieldwork objectives .....</b>	<b>5</b>
2.1 NLBH recording methodology .....	5
2.2 Fieldwork Objectives .....	5
<b>3 Provisional Results .....</b>	<b>7</b>
3.1 NLBH Connaught Tunnel.....	7
3.2 <i>Provisional</i> conclusions for future work: .....	17
<b>4 Future Deliverables .....</b>	<b>18</b>

## Figures

Fig 1 Example of a plan generated from the 3D model products supplied which were annotated on site.	6
Fig 2 A general view of the 19th century concrete-lined cutting and flying buttresses leading to the tunnel portal, looking north.	7
Fig 3 Location plan of the Connaught Tunnel	8
Fig 4 A view of the stone date panel above the tunnel portal, looking north.	9
Fig 5 General view of the tunnel interior, looking north.	9
Fig 6 View of the transition between single tunnel to twin tunnels with an air vent above , looking south.	10
Fig 7 View of the iron-banding incorporated to the central sections of the twin tunnels during works to lower the depth of the Albert Dock in 1935, looking south.	11
Fig 8 Detail of the iron banding with a doorway linking the twin tunnels, looking south-east.	12
Fig 9 Tunnel refuge, looking east	12
Fig 10 Northern tunnel vent superstructure, looking west.	13
Fig 11 Southern tunnel vent superstructure with pump house in the background, looking north.	13
Fig 12 View of the pump house built at the same time as the tunnel in order to pump out water which leaked in from the Albert Dock above, looking north.	14
Fig 13 Hydraulic pumping machinery within the shaft below the pump house.	15
Fig 14 Interior view of the timber roof structure of the pump house.	16

## 1 Introduction

This Interim Report covers the NLBH recording work undertaken by the MOLA Standing Buildings team at the Connaught Tunnel site. All fieldwork was conducted between 29/09/11 and 14/10/11 by a MOLA team headed by David Sorapure. A level 3 record of the tunnel, vents and pump house was undertaken, the fieldwork for which consisted of:

- A series of measured sketches to produce one plan, four sections and three elevations of the tunnel, one elevation of each of the vents and one plan, one section and two elevations of the pump house.
- Annotated sketches made during an on site analysis of the make up of the structures, with attention paid to any areas of alteration and repair.
- A photographic record including general and detailed shots taken by the MOLA photographic team, as well as photographs taken by the Standing Buildings team as an aid to off site analysis.

The event code (sitecode) is **XSYY11**

This document is an interim statement of the results of the NLBH fieldwork completed at the Connaught Tunnel site. More extensive results and conclusions will be included in the Fieldwork Report which will be submitted within six weeks of the end of fieldwork (Crossrail, *Design Consultant Framework Contract C122 Bored Tunnels Connaught Tunnel and Surface Rail Archaeological Written Scheme of Investigation, Doc. No. C122-OVE-T1-GMS-CR146\_WS158-00002, Rev. 5, 11.08.11*).

The fieldwork was carried out in accordance with:

- The Crossrail **Generic WSI: Archaeology Generic Written Scheme of Investigation**, doc no. 140022008-44ES-P2Z1
- A Crossrail **Site-specific Written Scheme of Investigation (SS-WSI): Design Consultant Framework Contract C122 Bored Tunnels Connaught Tunnel and Surface Rail Archaeological Written Scheme of Investigation, Doc. No. C122-OVE-T1-GMS-CR146\_WS158-00002, Rev. 5, 11.08.11**
- An **Archaeological method Statement C263 ARCHAEOLOGY LATE EAST Method Statement Watching Briefs, Non Listed Building recording and trench evaluation, Connaught tunnel, Doc. No. C263-MLA-X-RGN-CRG07-50023, Rev. 1, 28.09.11.**

## 2 Site Methodology and fieldwork objectives

### 2.1 NLBH recording methodology

The overall mitigation strategy for the NLBH on the Connaught Tunnel is to be preservation by record although much of the tunnel fabric will be retained. The 19th century tunnel, vents and pump house, as heritage assets of moderate importance required a level 3 record. As a further mitigation measure the pump house is likely to be dismantled, rather than demolished, in order for its reassembly and reuse either on its original site or elsewhere. The level 3 record was carried out prior to the structures being dismantled or altered.

A 3D model of the tunnel generated from laser survey cloud data of the tunnel were supplied by Crossrail (C122 CAD) and plans and sections were produced from these by MOLA. These drawings (eg Fig 1) were annotated on site and measured sketches were also drawn. The photographic record included both general views of the structure within its setting and detailed shots. Interventions into the fabric of the structures or the removal of samples of fabric were not necessary. The fabric of the structures underwent visual analysis on site, with the analysis continuing after the fieldwork, and will be informed by an appropriate level of documentary archive research, accessed through archive resource centres, libraries, etc.

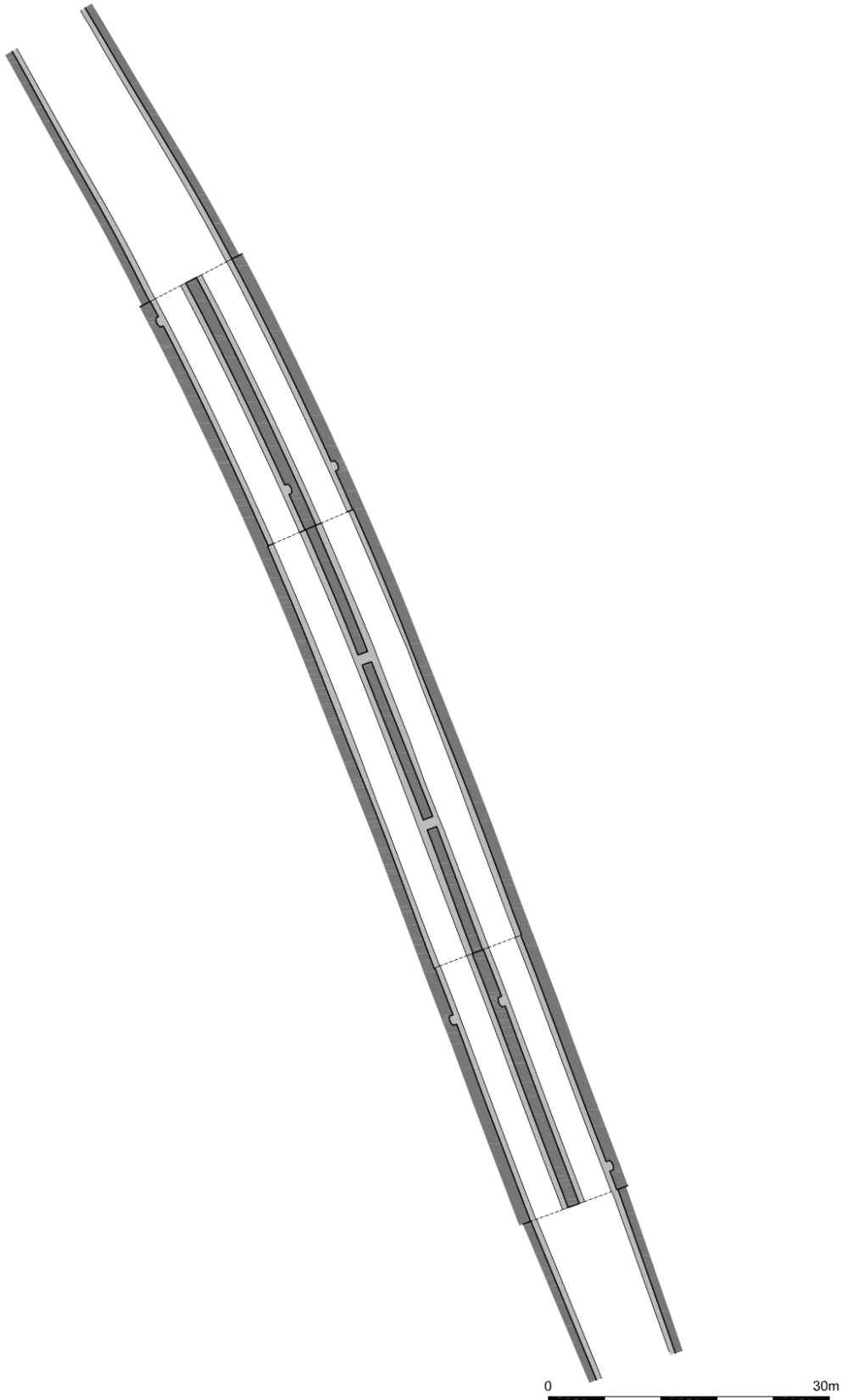
### 2.2 Fieldwork Objectives

The overall objective and aims of the NLBH recording was to secure preservation by record of the 19th century tunnel, vents and pump house prior to their alteration, dismantling and/or removal from site. The original fabric of the tunnel will largely be retained and the pump head house will be reassembled in a new location.

This NLBH work will result in a level 3 record in accordance with the specification set out in the English Heritage Guidelines (EH 2006). The fieldwork undertaken and the continuing office based off-site work will produce the requisite results in the form of a report.

This report will be issued in due course giving a written and illustrated description of the structure, analysis of its fabric, its history and use with site photographs and drawings reproduced.

This report and the site drawings and photographs will be archived under the site code XSY11, whilst a summary will appear in an appropriate publication such as the annual fieldwork roundup in the London Archaeologist.



*Fig 1 Example of a plan generated from the 3D model supplied which were annotated on site.*

### 3 Provisional Results

#### 3.1 NLBH Connaught Tunnel



*Fig 2 A general view of the 19th century concrete-lined cutting and flying buttresses leading to the tunnel portal, looking north.*

The Connaught Tunnel was constructed between 1876-8 by the London & St Katharine Docks Company as part of a project to extend the existing Victoria Dock to the east, a development which became the Albert Dock. The design engineer was Alexander Meadows Rendell and the works were carried out by the firm of Lucas and Aird. The dock extension ran east-west across the North Woolwich Railway Line owned by the Great eastern Railway Company. Initially a series of lifting and swing bridges was proposed however the potential disruption to both shipping and rolling stock was considered too great and it was agreed to sink a tunnel beneath the dock.

The 550 metre long, sinuous, north-south orientated tunnel was constructed using the cut-and-cover method. The tunnel drops on a 1:50 gradient and is entered from the north at Custom House and from the south next to the Brick Lane Music Hall (Fig 3). The tunnel is accessed via a concrete-lined cutting approximately 7.3 metres wide at either end (253 metres to the north, 583 metres to the south) which is reinforced by 15 concrete flying buttresses supported upon brick arches 3 header courses thick (Fig 2). The tunnel portals (Fig 4) to both north and south are 6.12 metres high at the crown of the intrados of the arch and feature 7 header courses of brick with concrete above to a total height above ground of approximately 8.8 metres. Both portals have

a bevelled-edge Portland stone date panel recessed into the concrete bearing the date “1878” to mark the completion of the tunnel construction. The yellow London stock brick lined single tunnel runs for approximately 120 metres to the north and 220 metres to the south (Fig 5) with alternating personnel refuges spaced approximately 39 metres apart on both sides (Fig 9). A section of the north-east single tunnel structure was damaged by bombing during World War 2 and was duly repaired in concrete. The central 200 metres is a twin tunnel structure approximately 5 metres high and 4.9 metres in wide. An air vent sits centrally above and between the twin tunnel portals (Fig 6).

In 1935 a decision was made by the Port of London Authority to deepen the Albert Dock to cater for the increasing size of shipping vessels and subsequently the level of the railway tunnel had to be lowered by 1 metre. The work commenced in October 1935 by the engineering firm of Chas, Brad and Sons Ltd. and consisted of the removal of a metre of brickwork from the twin tunnels and subsequent strengthening to the passages with a cast-steel lining approximately 145 metres long. The work was completed at a cost of £27,200 in March 1936 (Fig 7 & Fig 8).

The tunnel is served by two air vents which link to the twin tunnel portals. The above ground superstructure of the vents are 3.7 metres high by 3 metres wide round yellow London stock brick shafts set on a plinth, originally they were capped in stone although this has been replaced with modern concrete (Fig 10 & Fig 11).

An hexagonal pump house (Fig 12) was constructed to serve the tunnel and pump out water which leaked from the dock above. The pump house is 7.5 metres high and each external face is 2.5 metres wide. It constructed of yellow London stock brick with red brick bands, details and cornice. There are 5 surviving round headed windows with their original iron frames, a sixth window has been removed and replaced with a wooden air vent. An original doorway exists on the south elevation, however a northern doorway has been subsequently blocked. The roof is of slate with lead flashings and is capped by a wooden louvre. Internally the pump house has an exposed timber roof structure (Fig 14) and sits above a 15 metre deep shaft which contains the remnants of an historic hydraulic pumping mechanism (Fig 13).

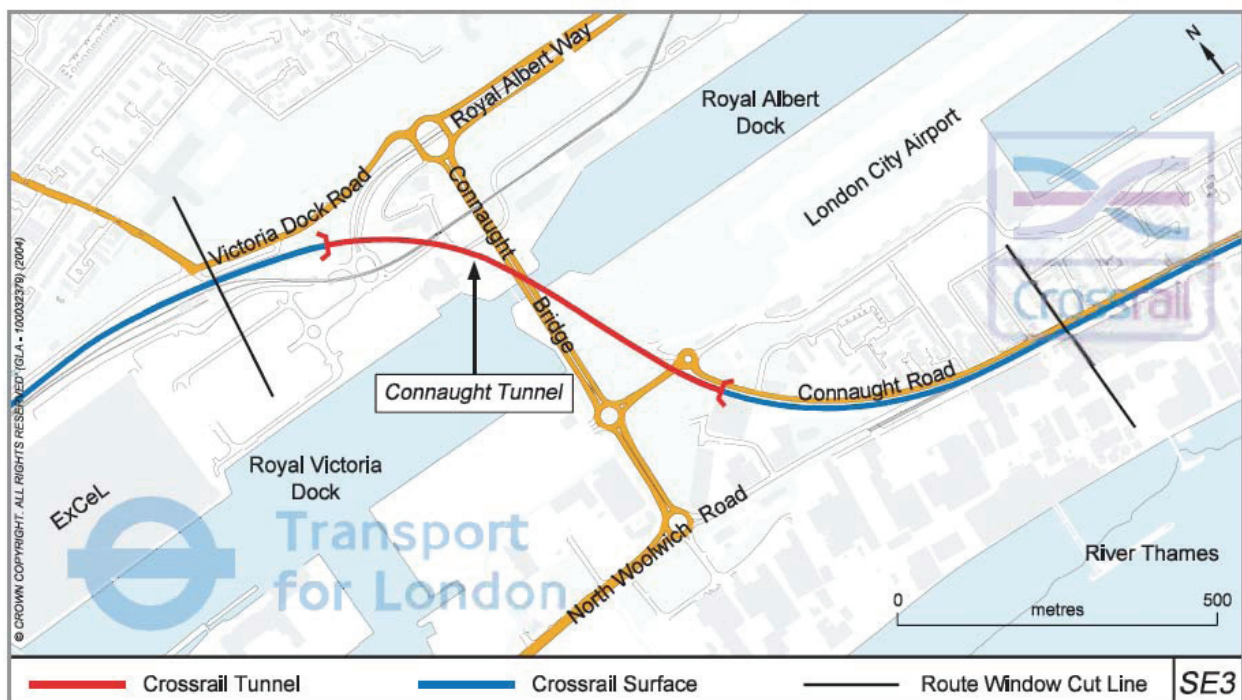


Fig 3 Location plan of the Connaught Tunnel





*Fig 4 A view of the stone date panel above the tunnel portal, looking north.*



*Fig 5 General view of the tunnel interior, looking north.*



*Fig 6 View of the transition between single tunnel to twin tunnels with an air vent above , looking south.*



*Fig 7 View of the iron-banding incorporated to the central sections of the twin tunnels during works to lower the depth of the Albert Dock in 1935, looking south.*



*Fig 8 Detail of the iron banding with an opening linking the twin tunnels, looking south-east.*



*Fig 9 Tunnel refuge, looking east*



*Fig 10 Northern tunnel vent superstructure, looking west.*



*Fig 11 Southern tunnel vent superstructure with pump house in the background, looking north.*



*Fig 12 View of the pump house built at the same time as the tunnel in order to pump out water which leaked in from the Albert Dock above, looking north.*



*Fig 13 Hydraulic pumping machinery within the shaft below the pump house.*



*Fig 14 Interior view of the timber roof structure of the pump house.*





### **3.2 *Provisional conclusions for future work:***

The NLBH at the Connaught Tunnel has been accurately recorded and there are no remains that require further examination within the site. The consultation of historical maps, relevant photographs of the area and documentary research will contribute to the analysis, and understanding of the structures. The sectional and elevation drawings of the structure produced by MOLA will also augment the analysis, record and reporting of the tunnel.



## **4 Future Deliverables**

The remaining deliverables for the site as specified by the Written Scheme of Investigation (doc no. C122-OVE-T1-GMS-CR146\_WS158-00002), are:

- **NLBH Fieldwork Report** (including OASIS Summary Sheet) to be delivered 25/11/11 (six weeks from the completion of the field work)
- **Summary Report** to be delivered 09/12/11 (8 weeks from the completion of the fieldwork)