



# Multi Disciplinary Consultant Package 4

## PLANNING AND ENVIRONMENT

Package Specific WSI Deliverable  
 DDBA Victoria Dock Portal

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## 1 Executive Summary

This assessment represents a commitment to providing early advice to establish the Cultural Heritage Resource of the site and surrounding study area. MDC4 has been appointed to undertake a Detailed Desk Based Assessment (DDBA) covering the proposed Victoria Dock Portal and Custom House Station as part of the Crossrail development (NGR 540460,180910 and 540950,180950 respectively).

The Victoria Dock portal is located approximately 150 m east of Royal Victoria DLR station, on Victoria Dock Road. Custom House station is located south of Victoria Dock Road near its junction with Freemasons Road, The ExCel Centre is located south of the station and beyond that the Royal Victoria Dock. Residential areas and a recreation ground lie to the north of the alignment (ES, Vol 3, 2005. p373). Alongside the construction of the portal and station themselves, the demolition of old Custom House station will be required as will the diversion of utilities.

There are no Scheduled Ancient Monuments within the study area around Victoria Dock Portal and Custom House Station. NB buildings of special architectural or historic interest – Listed Buildings – do not fall within the remit of this report – although there are several within the study area. The only non-designated extant structure within the study area is the Royal Victoria Dock.

The SMR identifies 33 entries within the study area. These include several Prehistoric deposits; no Roman entries; evidence of a medieval Manor and ditches; post medieval dock, ditch, culvert and dump, and a quarry, water channels and deposits of unknown date. Both sites are considered to have a high potential for prehistoric and later palaeo-environmental remains, including peat beds, and moderate potential for prehistoric remains, including structures such as timber trackways. Both sites also have high potential for industrial archaeology, including railway infrastructure and a filled-in drainage channel: the Royal Victoria & Albert Docks Cut. Any remains of structures such as prehistoric trackways would be of high importance; other resources would be of moderate importance.

The geoarchaeological deposit model for Victoria Dock Portal divides the area into 4 Landscape Zones. The results are as follows: Landscape Zone 1 lies in the northern region of the study area, and has good potential for Mesolithic to Roman archaeological dry-land remains, and may contain features cut into the underlying sub-surface deposits (surface of sand and gravels, and possibly lowermost fine-grained alluvium). There is reasonable potential for prehistoric to Roman archaeological remains in the form of boats, and subsistence equipment related to fishing and the exploitation of the Thames floodplain in Landscape Zone 2. Landscape Zone 3 could have good potential for evidence of dry-land prehistoric and later human activity. Landscape Zone 4 has reasonable to good potential for the recovery of prehistoric wetland archaeological remains (such as Bronze Age timber trackways or platforms), and excellent potential for the recovery of organic remains with palaeoenvironmental significance.

At both sites, preservation by record would be the most appropriate form of mitigation for archaeological remains of this type in this location. With this mitigation, no significant impacts will occur (ES Vol3, 2005. p380). The sewer shafts and manholes are likely to require localised archaeological excavation and other works probably an archaeological watching brief. With this mitigation, no significant residual impacts are predicted (SES2, 2006. p341). Further mitigation proposals will be detailed in the subsequent WSI.



## 2 Introduction

### 2.1 Project Background and Site Location

MDC4 has been appointed to undertake a Detailed Desk Based Assessment (DDBA) covering the proposed Victoria Dock Portal and Custom House Station as part of the Crossrail development.

Crossrail is a new cross-London rail link project which will provide transport routes across the southeast of England and London. The line will provide a range of both new and improved rail journeys across London and its immediate surroundings. The proposed development will include the construction of seven stations within central London which will have interchange with other public transport modes including the London Underground, National Rail and the London Bus service; the development will also include the renewal and/or upgrade of existing stations outside central London. The route itself will link Maidenhead and Heathrow in the west with Shenfield in the north-east and Abbey Wood in the south-east. As part of these works a portal at Victoria Dock and a new station at Custom House will be required.

The Victoria Dock portal is centred on National Grid Reference (NGR) 540460, 180910 (**Figure 1**). It will be located approximately 150 m east of Royal Victoria DLR station, on Victoria Dock Road. It will be constructed on the current alignment of Networks Rail's North London Line (NLL). The eye of the tunnels will be located opposite 250 and 250A Victoria Dock Road from where a ramp will be contained within a cut and cover box to the portal opposite 251A Victoria Dock Road. From this point, Crossrail will run in a retained cut to join existing track levels immediately to the west of Custom House station (ES, Vol 3, 2005. p373).

Custom House station is located south of Victoria Dock Road near its junction with Freemasons Road, NGR 540950, 180950 (**Figure 1**). The ExCel Centre is located south of the station and beyond that the Royal Victoria Dock. Residential areas and a recreation ground lie to the north of the alignment (ES, Vol 3, 2005. p373).

### 2.2 Proposed Development Summary

The portal structure forms a transition structure from tunnel to at grade construction. It provides access for maintenance, emergency intervention, and escape. There are two distinct design elements of the below ground element of this structure. The running tunnels enter into the cut and cover section formed using secant piles with in situ concrete roof and base slab. As the structure approaches ground level the structure changes to retained cut which has to be covered for operational reasons owing to the 1 in 30 grade of the alignment. This section of structure is formed in in situ concrete cast inside a sheet piled excavation. As the alignment reaches ground level and the gradient slackens the structure is completed by approx 80m length of U-Trough which provides passive flood protection. Flood protection to a level of 102.14mATD as recommendations in the Tunnel Flood Protection Strategy Report has been achieved with the provision of stop logs.

A head house is located above the tunnel reception chamber. The surface structure provides access for intervention, evacuation and maintenance of the underground railway. The internal structure is formed from reinforced concrete walls and floors. The ground floor level is at 102.14m ATD, which is the current flood level at Victoria Dock



Portal. Internal walls form a core for the sump access; lift shaft, intervention and evacuation stairs for the full height of the tunnel reception chamber.

The CLRL alignment has been moved north since the IRD to avoid diverting the 2.1m diameter Royal Dock Sewer. At the tunnel eye the movement is approximately 8 to 9 m north and at the east end near Custom House station the portal has moved approx 1.5 to 2.5m north. The change to the alignment moves the northern face of the structure outside the existing North London Line (NLL) railway boundary fence; however it is still within the Limit of Deviation (LOD).

The proposed development of the Custom House Station since IRD will involve:

Redesign of the station building support to eliminate the wall between the Crossrail and DLR tracks to avoid the necessity or constructing the wall during a number of possessions;

- The platform has been lengthened to compensate for the loss of area at the west end resulting from the relocated support walls;
- Redesign of the station layout to improve passenger flow through the station, aligning the entrance, ticket barriers, escalators and stairs;
- With an extended concourse area the canopy cover to the platform is reduced to a 25m length; and
- Simplification of the roof form

*There are ongoing discussions regarding the Design of Victoria Dock Portal. Reference should be made to the Report Victoria Dock Portal Options review document reference – CR-SD-DS1-X-RT-00003.*

## 2.3 Reporting Limitations

- The report has been prepared under the express instructions and solely for the use of CLRL.
- All work carried out in preparing this report has utilised and is based upon MDC4's professional knowledge and understanding of current (2008) relevant United Kingdom standards and codes, technology, and legislation. Changes in these areas may occur in the future and cause any conclusions, advice, recommendations or designs contained in this report to become inappropriate or incorrect. MDC4 does not accept responsibility for advising CLRL or any other interested parties of the facts or implications of any such changes in the future.
- This report has been prepared utilising factual information obtained from others. MDC4 take no responsibility for the accuracy of such information.
- This report represents an early stage of a phased approach to assessing the archaeological and cultural heritage resource of the site and study to allow the development of an appropriate mitigation strategy, should this be required. It does not comprise mitigation of impacts in itself.



### 3 Aims and Objectives of Assessment

It is in the interest of the local community, the developer and the Local Authority that archaeological and cultural heritage issues are discussed, with an appropriately trained specialist, at an early stage in the planning process. This assessment represents a commitment to providing early advice to establish the Cultural Heritage Resource of the site and surrounding study area.

The aims of this Detailed Desk Based Assessment were therefore to:

- Identify archaeology and cultural heritage constraints (including planning constraints) within and in the immediate vicinity of the site;
- Assess the baseline conditions and offer an analysis of the extent, preservation, sensitivity, potential and importance of the recorded cultural heritage resource within the site;
- Assess the baseline information and offer an analysis for the potential that unrecorded archaeology/cultural heritage remains survive within the site;
- Assess the potential impacts upon the known and currently unknown archaeological resource, taking into account the severity of the impacts and the importance of the resource, and;
- Propose a programme of further works and / or suitable mitigation measures to avoid, reduce or remedy any adverse impacts caused by development, if required.
- The specific traits of a DDBA differentiating it from a standard DBA include:
  - The use of extensive, new data from site specific surveys or additional documentary searches.
  - Qualitative level of analysis, detailed by site.
  - Reporting with detailed factual statement and scope for WSI (Written Scheme of Investigation), with interpretative site deposit model and detailed plan and with outline costs and scope of mitigations.



## 4 Methodology and Sources

This assessment was conducted with regard to standards set out by the Institute of Field Archaeologists (IFA).

Information was obtained for a study area extending 750 meter radius from Victoria Dock Portal and 750 meters radius from Custom House Station at OS grid-points 540460,180910 and 540950,180950 respectively (**Figure 2**). The scope of resources examined included statutorily designated cultural heritage sites such as Scheduled Monuments and Conservation Areas (Listed Buildings are not covered under the scope of this report), above ground non-designated built heritage features, as well as features of the cultural heritage resource recorded on the Greater London Sites and Monuments Record (GLSMR).

The general approach and methodology has been to consider the effects on the cultural heritage resources including Archaeological Sites and Monuments (including palaeo-environmental deposits assessed by means of a deposit model) – potential destruction or damage to sites and monuments due to permanent or temporary landtake and / or physical intrusion and indirect effects, such as changes to the drainage pattern.

These resources may be nationally or locally designated (by Registration or Scheduling), may appear in the national or local archaeological record, or may be identified from specialist scrutiny of the landscape and historic records.

A gazetteer listing the known cultural heritage resource within the study area was compiled and is provided in **Appendix 1**. Each entry has been marked on a cultural heritage features map (**Figure 2**) and discussed in the text. In addition this report includes a map regression study.

In summary the work has involved:

- identifying the sources available for consultation;
- assembling, consulting and analysing the available resources;
- consulting specialists as appropriate and;
- preparing the written report.



## 4.1 Sources

Amendment to Provision 2 - May 2006

Crossrail Archaeology Programming Assessment, November 2006.

Crossrail Environmental Statement. February 2005

Crossrail MDC4 Archaeology Updated Baseline Assessment, January 2008

Crossrail MDC4 Archaeology Overview of ground Levels and Land Raising around the Docks in the MDC4 area January 2008

Crossrail MDC4 Archaeology – Geoarchaeological Deposit Model: Victoria Dock Portal. January 2008

Historic maps including Rocque, Chapman and Andre, and Ordnance Survey

Supplementary Environmental Statement 2 (SES2). January 2006

Supplementary Environmental Statement 3 (SES3). November 2006

Technical Report – Assessment of Archaeology Impacts, Part 4 South-east Route Section. February 2005

MoLAS. The Holocene Evolution of the London Thames, Archaeological Excavations (1991-1998) for the London Underground Limited Jubilee Line Extension Project.

Victoria County History, Essex Vol 6

- SES & APS:
- SES 1- no relevant changes to Victoria Dock/Custom House
- SES3 Erratum - no relevant changes to Victoria Dock/Custom House
- SES4 – no relevant changes to Victoria Dock/Custom House
- Amendment to Provision 1 - January 2006 - no relevant changes to Victoria Dock/Custom House
- Amendment to Provision 3 - November 2006 - no relevant changes to Victoria Dock/Custom House
- Amendment to Provision 4 - May 2007 - no relevant changes to Victoria Dock/Custom House





## 5 Results

### 5.1 Statutory/Non statutory Protected Features

Both the Victoria Dock portal site and the Custom House station site lie within an archaeological priority area as designated by the London Borough of Newham.

There are no Scheduled Ancient Monuments within the study area around Victoria Dock Portal and Custom House Station. NB buildings of special architectural or historic interest – Listed Buildings – do not fall within the remit of this report – although there are several within the study area. The only non-designated extant structure within the study area is the Royal Victoria Dock (**GLSMR 221639/00/00**).

### 5.2 Sites and Monuments Record (SMR)

The local SMR, held by the Greater London Sites and Monuments Record (GLSMR) was consulted to establish if any additional non-designated Archaeological Findspots and sites or cultural heritage remains were recorded in their database since the Environmental Statement was written. 33 entries were identified by the GLSMR which are discussed below in the archaeological and historical background section. A gazetteer of these finds can be found in Appendix 1.

The report on the updated baseline (Crossrail MDC4 Archaeology – Updated Baseline, 2008. p18) states that there are new pieces of baseline data (not all of which are in the GLSMR). They are as follows:

Victoria Dock Portal:

- BCQ07 – Evaluation. Sedimentary sequence giving environmental/topographical information including peat and palaeochannels. Outside LLAU/LOD (Land to be Acquired or Used/Limits of Deviation)
- BUZ07 - Evaluation. Sedimentary sequence giving environmental/topographical information including peat and palaeochannels. Outside LLAU/LOD
- CDQ07 - Evaluation. Sedimentary sequence giving environmental/topographical information including peat and palaeochannels. Outside LLAU/LOD
- DLA03 – Watching brief and evaluation of bore holes. Sedimentary sequence giving environmental/topographical information. Outside LLAU/LOD
- FDP07 - Evaluation. Sedimentary sequence giving environmental/topographical information including peat and palaeochannels. Also Bronze Age flint debitage. Outside LLAU/LOD
- HW-PR92 – evaluation. Residual Roman pottery in 19th century deposit above post-medieval plough soil. Outside LLAU/LOD
- LSI05 (MLO9813) – Watching brief. Sedimentary sequence giving environmental/topographical information. Principal peat deposits may relate to a single prehistoric marine regression. Outside LLAU/LOD.



- NPW04 (MLO78300) – Standing building recording. Multi-storey tobacco warehouse built in 1859 to serve Victoria Docks. Immediately adjacent to LLAU/LOD.
- RSC98 – Evaluation. Peat deposits (probably alluvial sequence). Modern made ground. Outside LLAU/LOD
- SAU05 – Evaluation. Undated hillwash, sealed by post medieval topsoil. Outside LLAU/LOD
- VAD07 – Evaluation. Sedimentary sequence giving environmental/topographical information including peat and palaeochannels. Outside LLAU/LOD
- VDR04 (MLO98302) - Evaluation. Sedimentary sequence giving environmental/topographical information including peat, indicating that the site was wetland and marshland until its 18th-19th century drainage and development. Within LLAU/LOD. Discussed below.

Two Grade II listed Warehouses – K and W - (**GLSMR 470220 & 470221**) are also in the updated baseline data (for Victoria Dock Portal and Custom House Station), however listed buildings are beyond the remit of this assessment.

#### Custom House Station:

- BCQ07 - Evaluation. Sedimentary sequence giving environmental/topographical information including peat and palaeochannels. Outside LLAU/LOD.
- BOX 98 (062697) - Evaluation. Peat and clay deposits overlain by modern demolition debris Outside LLAU/LOD.
- BUZ07 - Evaluation. Sedimentary sequence giving environmental/topographical information including peat and palaeochannels. Outside LLAU/LOD.
- CFN99 (062903) - Evaluation. Natural gravel and alluvial layers overlain by modern made ground. Outside LLAU/LOD.
- DLA03 Watching brief and evaluation of boreholes. Sedimentary sequence giving environmental/topographical information. Outside LLAU/LOD.
- HW-KG92 (062197) - Evaluation. 16th – century drainage ditch in use to 19th/20th century. Outside LLAU/LOD.
- HW-PR92 - Evaluation. Residual Roman pottery in 19th-century deposit, above post-medieval plough soil. Outside LLAU/LOD.
- LS105 (ML098113) - Watching brief. Sedimentary sequence giving environmental/topographical information including peat and palaeochannels. Outside LLAU/LOD.
- NPW04 (ML078300) - Standing building record. Multi-storey warehouse built in 1859 to serve Victoria Docks. Immediately adjacent to LLAU/LOD.
- SAU05 - Evaluation. Undated hillwash, sealed by post-medieval topsoil. Outside LLAU/LOD.
- SQY03 - Watching brief. 19th-century made ground from construction, use and partial destruction of Victoria Docks. Outside LLAU/LOD.



- VAD07 - Evaluation. Sedimentary sequence giving Environmental/topographical information including peat and palaeochannels. Outside LLAU/LOD.

### 5.3 Geology, Topography and Palaeoenvironment

Average ground levels in the area surrounding the Crossrail site lie between c 1.4 and c 2.2m OD, whilst in an area of c 150 m around the Royal Victoria Dock, ground levels rise to c 4.5 and c 5.8m OD. It appears that this is likely to be the result of dumping spoil (redeposited alluvium) from the excavation of the dock around its perimeter. Redeposited alluvium (over *in situ* alluvium) c 2 to 3m thick has been recorded on two archaeological sites in this area (sitecodes SVY02, TWF07), itself overlain by 'made ground' c 2 to 3m thick. Custom House lies immediately to the east of the Victoria Dock Portal, and the situation is very similar to that described in the preceding section. In particular, the site lies north of the area of land raising around Royal Victoria Dock, and the trackbed should not have affected potential archaeological remains (Overview of ground Levels and Land Raising around the Docks in the MDC4 area, 2008. p2).

*In situ* alluvium has been recorded at c -1.0 to c 1.0m OD with an average thickness of 1.0 to 1.5m (BUE98, HE-FO94, BWC96, etc). Peat was present beneath this alluvium on three out of five sites. The surface of the natural geology (Shepperton Gravels) has been recorded between c -3.0 and c -1.0m OD (BUE96, HE-FO94, BWC96, SVY02, TWF07, etc). (Overview of ground Levels and Land Raising around the Docks in the MDC4 area, 2008. p2).

Estimated depth of c 4.5m to 5.5m of archaeological and palaeoenvironmental deposits could occur across the Victoria Dock Portal Site. This may include recent dock-related activity (much of the upper part of the 'made ground' recorded in boreholes is likely to be treated as low-importance archaeological deposits, depth unclear) and alluvial deposition including peat. Individual deeply-cut features such as dock structures and palaeochannels may extend below this level (Crossrail Archaeology Programming Assessment, 2006. p128).

### 5.4 Deposit Modelling

Through the study of the relationship (both horizontally and vertically) of the various sediments types, and the depositional environments which they represent, the area under assessment has been divided into 4 landscape zones (LZs). These zones facilitate assessment of the potential of these areas for the preservation of archaeological and palaeoenvironmental material.

The results are as follows:

Landscape Zone 1 (LZ1) lies in the northern region of the study area, and has **good potential for Mesolithic to Roman archaeological dry-land remains**, and may contain features cut into the underlying sub-surface deposits (surface of sand and gravels, and possibly lowermost fine-grained alluvium). However, as this marginal area of the Thames floodplain would have been exposed as dry land for much of the prehistoric and historic periods, biological material used to help generate palaeoenvironmental data, as well as organic artefacts such as bone tools and wooden structures, are unlikely to be preserved.



Landscape Zone 2 (LZ2) comprises the central east–west section of the study area, and is characterised by generally low-lying land, probably associated with a network of braided channels flowing across this area of the Thames floodplain from the late Pleistocene/early Holocene, to historic periods. There is reasonable potential for prehistoric to Roman archaeological remains in the form of boats, and subsistence equipment related to fishing and the exploitation of the Thames floodplain in this landscape zone. However, this area is key in our understanding of the changing behaviour of fluvial systems occurring during dramatic changes in climate regime (ie glacial – interglacial episodes). Such an understanding is not only important in its own right, but if associated with evidence for human activity, allows for the elucidation of the interaction between past human populations and these landscape features.

Areas where the surface of the Pleistocene gravel and sand are relatively high constitute the landscape of LZ3 (Landscape Zone 3). These ‘islands’ of sand and gravel are important in our understanding of the exploitation of the Thames floodplain during the prehistoric periods as they are likely to have remained higher and drier above the marshy environment of the channel marginal area (Landscape Zone 4), and could therefore have good potential for evidence of dry-land prehistoric and later human activity.

Landscape Zone 4 (LZ4) is essentially the transitional environment between the higher ground of the sand and gravel islands (as well as the higher ground to the north), and the network of channels associated with the east-west braidplain. This landscape zone is characterised by thick, well-developed peats which testify to an increase in wetland vegetation at the margins of the main channel network. LZ4 has reasonable to good potential for the recovery of prehistoric wetland archaeological remains (such as Bronze Age timber trackways or platforms), and excellent potential for the recovery of organic remains with palaeoenvironmental significance.

For the full Geoarchaeological Deposit Model text refer to **Appendix 2**. For the deposit models refer to **Appendix 3**.

## 5.5 Previous Excavation or Survey

The GLSMR identifies several previous geoarchaeological evaluations, excavations and Desk Based Assessments. These include:

- **ELO921** – An archaeological excavation carried out in 1997 at the Royal Docks Community School Site which revealed prehistoric and medieval evidence for human activity. (Associated finds are discussed below- **MLO77313, MLO77311, MLO77310, MLO77309, MLO77308, MLO76393, MLO77312, MLO77307** )
- **ELO3685** – Evaluation undertaken at the former Albert Dock hospital in 1996. (Associated finds are discussed below - **GLSMR 062477/00/00 062476/00/00, 062475/00/00, 062650/00/00**)
- **ELO3688** – evaluation undertaken as Barnwood Court in 1997. (Associated finds are discussed below **GLSMR 062651/00/00, 062650/00/00**)
- **ELO3695** – evaluation undertaken at Butchers Road in 1996. (Associated finds are discussed below **GLSMR 062493/00/00, 062494/00/00, 062495/00/00**)
- **ELO3260** – Watching brief undertaken at Eastwood Road in 1997. (Associated finds are discussed below **GLSMR 062675/00/00, 062674/00/00**)



- **ELO6896** – Archaeological evaluation at the Victoria Dock Road in 2004. (Associated finds are discussed below **MLO98302**)
- **ELO6594** – archaeological watching brief undertaken at Leslie Road in 2005. (Associated finds are discussed below **MLO98113**)
- **ELO4451** – evaluation undertaken at St Luke’s School and land adjacent in 1998. (Associated finds are discussed below **GLSMR 062804/00/00**)
- **ELO2981** – Evaluation at Coolfin Road in 1999. (Associated finds are discussed below **GLSMR 062903/00/00**)
- **ELO2853** – Evaluation undertaken at Boxley Street in 1998. (Associated finds are discussed below **GLSMR 062697/00/00**)
- **ELO3260** – Watching brief at Eastwood Road in 1997 (Associated finds are discussed below **GLSMR 062673/00/00**)

## 5.6 Chronological Summary/Archaeological and Historical Background

This section provides a brief overview of the archaeological background of the study area which will aid understanding of the likelihood of encountering currently unrecorded resources within the application site and potentially determine their significance and likely condition.

### 5.6.1 Prehistoric Period (c500,000BP – AD50)

Following the end of the last glaciation, the Thames and the lower Lea followed a course of multiple braided channels, which would have accumulated organic sediments as they became disused, between c 11,000 and 9000 BC. The likely environment comprised marshes, shallow watercourses, sand banks and islands where hunting, fowling, fishing and plant resources would have attracted nomadic groups. Such landscapes may in part have been sealed and preserved by alluvium in subsequent transgression phases, but they would be characterised by transient activity rather than settlement. They are also likely to have been truncated by down-cutting and erosion from later channel formations. Rising sea levels and flooding of the Thames estuary would have led to the inundation and abandonment of these traditional hunting grounds, placing greater pressure on resources inland (Assessment of Archaeology Impacts, part 4, 2005. p3/ MoLAS, *The Holocene Evolution of the London Thames*).

There is a background potential for river use and flood defence features such as revetments, causeways, trackways, fish weirs, and boats in the prehistoric, Roman, Saxon and medieval periods (Assessment of Archaeology Impacts, part 4, 2005. p3). Any such prehistoric structures would be of high importance (ES Vol3, p412).

The GLSMR identifies many entries from the prehistoric period. These include several prehistoric finds within the study area. Including **GLSMR 061758/00/00** - a prehistoric axe at Victoria Pontoon Dock; and two prehistoric axes (**GLSMR 060582/00/00 & 061759/00/00**) at the Royal Victoria Dock, which are likely to have been discovered during the construction of the docks in 1855. A late Neolithic to late bronze age spearhead (**GLSMR 061744/00/00**) was also found at Plaistow Marshes some time before 1865.



An excavation, mentioned above, at the Royal Docks Community School Site revealed evidence of prehistoric activity including: Early Neolithic to late bronze age buried soil present across the site, with some Mesolithic microburins and one microlith (**MLO76393**). Late Neolithic to early bronze age peat (**MLO77313**) and a prehistoric gully (**MLO77311**). In the southeast corner of the excavation at Royal Docks Community School Site ran a concentration of stakeholes marking out a rectangular shape which has been interpreted as a prehistoric timber platform or jetty (**MLO77310**). A prehistoric pit (**MLO77309**) was identified as some type of storage pit perhaps originally with a timber or hide cover. Further prehistoric backfilled pits (**MLO77308**) filled with flints and charcoaly burnt sand were identified as potential cooking pits/boiling pits. Burnt stone was found in a heap adjacent to the pits – which could have been used to heat the water or cook the meat with.

Several evaluations within the study area identified waterways, peat and deposits all dating from the prehistoric period. This include:

- Evaluation (**ELO3685**) undertaken at the former site of Albert Dock hospital, Baxter Road, in 1996 revealed prehistoric evidence. Including - early Bronze Age to 19th century flood deposits (**GLSRM 062477/00/00**), bronze age water channel (**GLSMR 062476/00/00**) and peat (**GLSMR 062475/00/00**).
- Evaluation undertaken as Barnwood Court in 1997 (**ELO3688**) revealed also Bronze Age flood deposit (**GLSMR 062651/00/00**), Bronze Age and Neolithic peat (**GLSMR 062650/00/00**).
- Evaluation undertaken at Butchers Road in 1996 (**ELO3695**) revealed Bronze Age peat (**GLSMR 062493/00/00**), Late Bronze Age to early Iron Age peat (**GLSRM 062494/00/00**) and Iron Age peat (**GLSRM 062495/00/00**).

This site has a **high** potential for prehistoric and later palaeo-environmental remains, including peat beds, and **moderate** potential for prehistoric remains, including structures such as timber trackways. Any remains of structures such as prehistoric trackways would be of high importance; other resources would be of moderate importance

#### 5.6.2 Roman Period (AD50-450)

During the Roman period much of this area would still have been marshy open land, although occupation evidence suggests that sea levels were much lower than they are today and that the marshes were drier, and were probably drained and extensively used. Potential Roman roads and trackways lie outside of the study area highlighting Roman activity in proximity; these routes include a trackway at the alignment of Green Street and Boundary Lane and a possible Roman road, marked by East Ham High Street and East Ham Manor Way, leading from the higher ground to the north down towards the ferry crossing at North Woolwich.

However, there are no sites and monuments entries for Roman evidence within the study area.



### 5.6.3 Medieval Period (AD450-1540)

By the Early Medieval period much of the floodplain of East London was once again marshland due to the rising levels of the Thames. To the north, on the higher and drier ground, were the manors of West Ham and East Ham (Assessment of Archaeology Impacts, part4, 2005. p3).

The medieval manor of Sudbury (**GLSMR 061790/00/00**), was situated within the study area. The last documented reference to it was in 1545 when it was in the possession of the crown. It is presumed to have been subsequently merged with the manor of West Ham. The exact site of the Manor is not known, however a field called Sudburyfield in the south of the parish may represent the site.

Medieval evidence was also revealed during excavations at the Royal Docks Community School Site (**ELO291**). Evidence included ditches (**MLO77312**) – likely to be drainage ditches with a raised bank or dyke on the river side.

Moderate importance: *moderate potential* for the site of medieval manor house of Sudbury. *Reasons:* potential to contribute to *published priorities* (Museum of London, 2002, 25)

### 5.6.4 Post Medieval (AD1540-1900)

By the early 17th century much of the marsh had been drained and reclaimed although 1612 – 1613 severe flooding occurred in the area. The ditches that were dug to drain the levels developed into major drainage dykes, becoming open sewers feeding into the tributaries of the Thames. This process of land reclamation continued into the 19th century.

By the middle of the 19th century the area had changed significantly, as London became an increasingly important international port and the associated area of docks, warehouses and industry expanded eastwards. The Royal Docks were the last to be built in London and formed the largest area of impounded dock in the world. The Royal Victoria Dock (**GLSMR 221639/00/00**) was the first of the large Victorian docks constructed in 1850-1855. The Royal Victoria was the first dock directly connected to the railway system and hydraulic power was installed from the beginning. The construction methods were radically different from the earlier docks which were durably built of stone for sailing ships, in the case of the Royal Victoria Dock a definite life span was envisaged. Five finger jetties were constructed on the North Quay to increase capacity and there was a tidal basin at the western end. Originally the docks were largely earthen banks but they were considerably rebuilt between 1935-44.

There are several other post medieval entries in the sites and monuments record. These include a post medieval ditch (**GLSMR 062197/00/00**) at King George Avenue, Custom House. A culvert (**GLSMR 062675/00/00**) and a dump and yard (**GLSMR 062674/00/00**) identified during a watching brief (**ELO3260**).

Moderate importance: *high potential* for industrial archaeology, including railway infrastructure and a drainage cut (Assessment of Archaeology Impacts, part4, 2005. p34).



### 5.6.5 Modern (AD1900+)

Both sites also have **high** potential for industrial archaeology, including railway infrastructure and a filled-in drainage channel: the Royal Victoria & Albert Docks Cut.

No GLSMR entries date from this period.

### 5.6.6 Unknown

There are several entries in the Sites and Monuments record which are of unknown date. These include:

- Potential ard marks (**MLO77307**) found at the Royal Docks Community School Site (**ELO921**).
- Archaeological evaluation with no finds or features and no date (**MLO98302**); associated event – **ELO6896**.
- Archaeological watching brief identifying made ground of unknown date to 19th century (**MLO98113**); associated event – **ELO6594**.
- Evaluation with negative evidence (**GLSMR 062903/00/00**); associated event – **ELO2981**.
- Borehole results from the Royal Victoria Dock revealing water channels – **GLSRM 062484/00/00 & 062483/00/00**.
- Evaluation revealing negative evidence (**GLSMR 062804/00/00**); associated event **ELO4451**.
- Evaluation revealing flood deposit and peat of unknown date (**GLSMR 062697/00/00**). Associated event **ELO2853**.
- Watching brief revealing a quarry of unknown date (**GLSMR 062673/00/00**). Associated event **ELO3260**.

## 5.7 Map Regression

A search was undertaken of a range of Historic Survey Maps covering the study area. The progressive maps document the history and development of the site and its environs, as well as changes in settlement and land use within the wider study area. The Ordnance Survey (OS) Maps examined dated from 1844 to 1914, while the earliest non OS map of relevance to this assessment was the 1746 Rocque Map. See **Appendix 4** for historic maps.

**1746 Rocque Map** shows that the site and study area is undeveloped. There are field boundaries and ditches across the area though.

**1777 Andre and Chapman Map** shows that the site is still undeveloped. The land is mainly rough grassland/marsh land.

**1799 Ordnance Survey Map** shows that the area is still undeveloped with a series of field boundaries and ditches across the site.





**1844 Ordnance Survey Map** shows that the Victoria Dock has been built immediately south of where Custom House Station and Victoria Dock Portal will be built. The railway lines are present located in where the development will take place. The area to the north of the portal and station remains undeveloped except for ditches/pathways/roads?

**1867 Ordnance Survey Map** Various warehouses are located to the south of the proposed development. Custom House station lies to the southeast of the development. The Great Eastern Railway Line (North Woolwich Branch) is located to the north of the warehouses, where the portal and station will be located. The land above the area to be developed has some residential development but otherwise still remains fields.

**1894 Ordnance Survey Map** Various warehouses are still located to the south of the proposed development. Custom House station lies to the southeast of the development. The Great Eastern Railway Line (North Woolwich Branch) is located to the north of the warehouses, where the portal and station will be located. The area to the north of the development is completely residential.

**1914 Ordnance Survey Map** this map remains unchanged from the previous except for the residential area being even more heavily developed.

## 5.8 Evidence for recent or previous truncation/disturbance to archaeological horizons

Past impacts included the construction of the dock buildings, the Royal Victoria and Albert Docks cut, and railway infrastructure.

Impacts from existing basements: The only standing building shown on OS mapping within the LLAU/LOD at Royal Victoria Dock Portal is The Barge public house, on the northern side of Victoria Dock Road. As a public house, it may well have a cellar. This building is to be demolished (Overview of ground Levels and Land Raising around the Docks in the MDC4 area, 2008. p2).

Impacts from the existing railway: The existing railway is slightly higher than adjacent ground levels. It lies between 0.5 and 1.2m above Victoria Dock Road (increasing as the road slopes down to the west) and between 0.6 and 0.15m above Seagull Lane.

Assuming that the trackbed is c 0.5 to 0.6m deep, it should not have affected potential archaeological remains in this area (Overview of ground Levels and Land Raising around the Docks in the MDC4 area, 2008. p2).



## 6 Discussion

### 6.1 Baseline Data Summary and Research Agenda

There are 33 GLSMR entries within the study area for the Victoria Dock Portal. These include several Prehistoric deposits; evidence of a medieval Manor and ditches; post medieval dock, ditch, culvert and dump, and a quarry, water channels and deposits of unknown date.

The map regression shows that the area remained largely undeveloped until the 1844 Ordnance Survey Map when Victoria Dock, Custom House station and the Great Eastern railway line had been developed. From this period on the area is shown as becoming increasingly developed – both industrially and residentially.

The archaeological potential of the area gives rise to several prospective research agendas. These have been generally identified in the technical note on the Assessment of Archaeological Impacts, 2005. Research areas considered specific to Victoria Dock include:

- Identifying the industries that especially represented London
- Understanding the relationship between landscape, river and settlement, and the influences of the Thames in particular on communication and social interaction.
- Understanding the relationship between the Bronze Age wooden trackways and the settlement to which they presumably led, and what the trackways represent in terms of woodcraft and woodland management.
- Understanding the nature and meaning of the deposition of metalwork in the Thames and at the headwaters of river tributaries.

### 6.2 Impacts

#### 6.2.1 Victoria Dock Portal:

The portal works consist of the tunnel approach ramp within a retained cut, a length of cut-and-cover tunnel, and a shaft at the tunnel eye. The shaft would be used during construction for the removal of TBMs and on completion would provide access for emergency services and passenger escape facilities. A construction compound ('worksite') would extend along the proposed route and service diversions are required. The **impacts** are:

- **Tunnel eye** incorporating a **shaft** for construction, and for access for emergency services and passenger escape facilities. The shaft would measure 28m by 20m and employ diaphragm walls descending to c –20.8m OD. Formation level for the base slab would lie at c –10m OD. The **impact** of the construction of the **shaft** would be to completely remove potential archaeological remains.
- Excavation of a 60m-long **cut-and-cover tunnel**, between the open cut and the shaft. The toe of the diaphragm walls would ascend eastwards in steps from c –13m to –11.5m OD and the base slab formation level from c –9.4m to c –7.5m OD. The impact would be to completely remove potential archaeological remains. Excavation of a 190m-long tunnel approach **ramp** within an open cut retained by diaphragm



walls. The toe of the diaphragm walls would ascend eastwards in steps from  $c - 11.5\text{m}$  to  $c - 6.75\text{m OD}$  and the base slab formation level from  $c - 7.5\text{m}$  to  $c - 2.6\text{m OD}$ . The **impact** would be to completely remove potential archaeological remains.

- Excavation of a 60m-long approach **ramp** within an open cut retained by steel sheet piling walls. The toe of the sheet piles would ascend eastwards from  $c - 8.40\text{m OD}$  to  $c - 5.90\text{m OD}$  and the base slab formation level from  $c - 2.6$  to  $c - 1.16\text{m OD}$ . The **impact** would be to completely or partially remove potential archaeological remains.
- **A construction compound** (Victoria Dock/Custom House Worksite) serving both this site and Custom House Station (Site 220, below). It extends from east of the Prince Regent DLR station along the cutting, westwards to Royal Victoria DLR station (including the ExCel car parks south of the railway and two small areas on the north side of Victoria Dock Road near the junction with Freemasons Road). **Impact:** although details are not yet available, preparatory ground reduction, hard standing and footings for plant, accommodation and a site footbridge ( $c 1\text{m}$ ) may partially remove potential archaeological remains. A tower crane base, supported on piled foundations, may completely remove such remains (locally).
- **Major service diversions:** the Royal Docks surface water sewer, Royal Docks foul sewer, and local surface water sewer diversions would comprise tunnelling accessed by two 18m deep by 10m diameter **shafts** and three 16m deep by 3m diameter **shafts**. The service tunnels would lie beneath the alluvium and therefore not have an impact. The **impact** of the shafts would be to completely remove surviving archaeological remains within their footprints at Site 219 and Site 220.
- **Other service diversions**, including a gas main are likely to partially remove surviving archaeological remains.
- The temporary **diversion** of **DLR** between Royal Victoria Station and Custom House Station to run south of the current route through the proposed worksite may have the potential to remove archaeological remains. There would be a duct under the tracks. The laying of track should have no impact on potential archaeological remains, but associated works might partially remove any such remains.
- Laying down of an area of **hard standing** between the Excel Car Park and the DLR is only likely to have an impact on any surviving remains of the late 19th-century railway sidings. The removal of the existing **North London Line track** on the line of the Victoria Dock Portal would probably have **no impact** on potential archaeological deposits.
- Changes in groundwater level have been predicted at this site. The potential impact, if any, cannot be adequately quantified due to a lack of detailed information; in particular on present groundwater regime and on the nature of any surviving archaeological remains. However, there are no known resources on the site of a type which might be adversely affected, although there is potential for waterlogged organic remains (Assessment of Archaeology Impacts, part4, 2005. p36).
  - Magnitude of impact before mitigation – high, with potential for a significant impact
  - Residual impact after incorporated mitigation – none, the incorporated mitigation measures would constitute preservation by record.
  - Site specific mitigation – none required
  - Residual impact after site specific mitigation – none



- Significance of residual impact – non-significant

### 6.2.2 Custom House Station

Demolition of the existing station and buildings to the west of it. The new station would include a main concourse area and ticket office (raised at bridge level over the tracks) and an island platform (at ground level; accessed via stairs, escalator and a lift at the west end, with escape bridges at the middle and east end of the platform). The **impacts** are (Assessment of Archaeology Impacts, part4, 2005. p36):

- **Excavation and other ground works.** An area running the length of the track for c 375m, including the total area of the station, would be excavated to a depth of c 1.5m below ground level, increasing to 3m in the vicinity of Victoria Dock Portal. Subsequent works here include track laying, construction of 245m-long island platforms, pad foundations for some of the lifts/stairs/escalators, and ground disturbance within construction compounds. The **impact** of these works would be to partially or completely remove potential archaeological remains within the excavated area (see below for the impact of piling).
  - **Piled foundations.** Contiguous piled retaining walls are required along the full length of the excavated track. The high-level station building, footbridges, some of the lifts/stairs/escalators and an extension of the existing ExCel exhibition centre walkway, would also have piled foundations. Piling would increase the **impact** within the area of ground reduction (above) to complete removal of any surviving remains locally, along the line of the retaining walls and at individual pile and cap positions elsewhere.
  - **Station entrance building** at Freemason's Road and Victoria Dock
  - Road, constructed following demolition of the former public house, 'The Barge' (c 1862). The new building would have piled foundations. Stairs, escalators, a lift, and an associated plant room, would be supported on pad foundations. The **impact** would be to partially or completely remove potential archaeological remains locally, within the areas of individual foundations.
  - **Major service diversions:** see Victoria Dock Portal.
  - **Other service diversions** (Trunk Water Pipe, Sewer, BT cables, Transco pipe). Details will not be available within the timescale of the EIA, but these works are likely to partially remove potential archaeological remains.
  - **Ramp** up from south side of Victoria Dock Road to bridge level. The **impact** of the 1.5m deep ramp footings would be to partially remove potential archaeological remains.
  - **Construction compound:** see Victoria Dock Portal.
  - A **lay-by** area and **cycle park** on the north side of the Victoria Dock Road just west of junction with Freemason's Road would be unlikely to have any impact on potential archaeological deposits.
- Magnitude of impact before mitigation – moderate with potential for a significant impact



- Incorporated mitigation – the generic data gathering and mitigation measures, as described in the incorporated mitigation, would be applied to this Crossrail site. Initially DDBS and /or field evaluation would be required to establish levels of survival. This is likely to lead to further archaeological investigation, potentially to the base of the alluvium, constituting preservation by record.
- Residual impact after incorporated mitigation – none, the incorporated mitigation measures would constitute preservation by record
- Site specific mitigation – none required
- Residual impact after site specific mitigation – none
- Significance of residual impact – non-significant.

### 6.3 Mitigation and Residual Impacts

Most of the works associated with the Victoria Dock portal would completely remove all surviving archaeological remains within their footprints. The eastern end of the ramp may partially remove remains as would the diversion of services and a gas main. Footings for structures within the Victoria Dock/Custom House worksite and a dewatering system may partially remove any surviving 19th Century railway or canal remains (ES Vol3, 2005. p380).

Construction shafts for the diversion of the Royal Docks surface water sewer, Royal Docks foul sewer, and local surface water sewers would also completely remove potential archaeological remains (ES Vol3, 2005. p380).

With respect to the Custom House station works, ground reduction for the below ground tracks and platforms and service diversions are likely to partially or completely remove potential archaeological remains. Foundations associated with the new station and other structures are likely to partially remove potential archaeological remains and completely remove them within the footprints of piles, where used. In addition, dewatering systems and an access ramp are also likely to partially remove archaeological remains (ES Vol3, 2005. p380).

At both sites, preservation by record would be the most appropriate form of mitigation for archaeological remains of this type in this location. With this mitigation, no significant impacts will occur (ES Vol3, 2005. p380). The sewer shafts and manholes are likely to require localised archaeological excavation and other works probably an archaeological watching brief. With this mitigation, no significant residual impacts are predicted (SES2, 2006. p341).



## **7 Recommendations**

At both Victoria Dock Portal and Custom House Station preservation by record would be the most appropriate form of mitigation for archaeological remains, of this type, in this location. With this mitigation, no significant impacts will occur (ES Vol3, 2005. p380). The sewer shafts and manholes are likely to require localised archaeological excavation and other works probably an archaeological watching brief. With this mitigation, no significant residual impacts are predicted (SES2, 2006. p341). Further mitigation proposals will be detailed in the subsequent WSI.

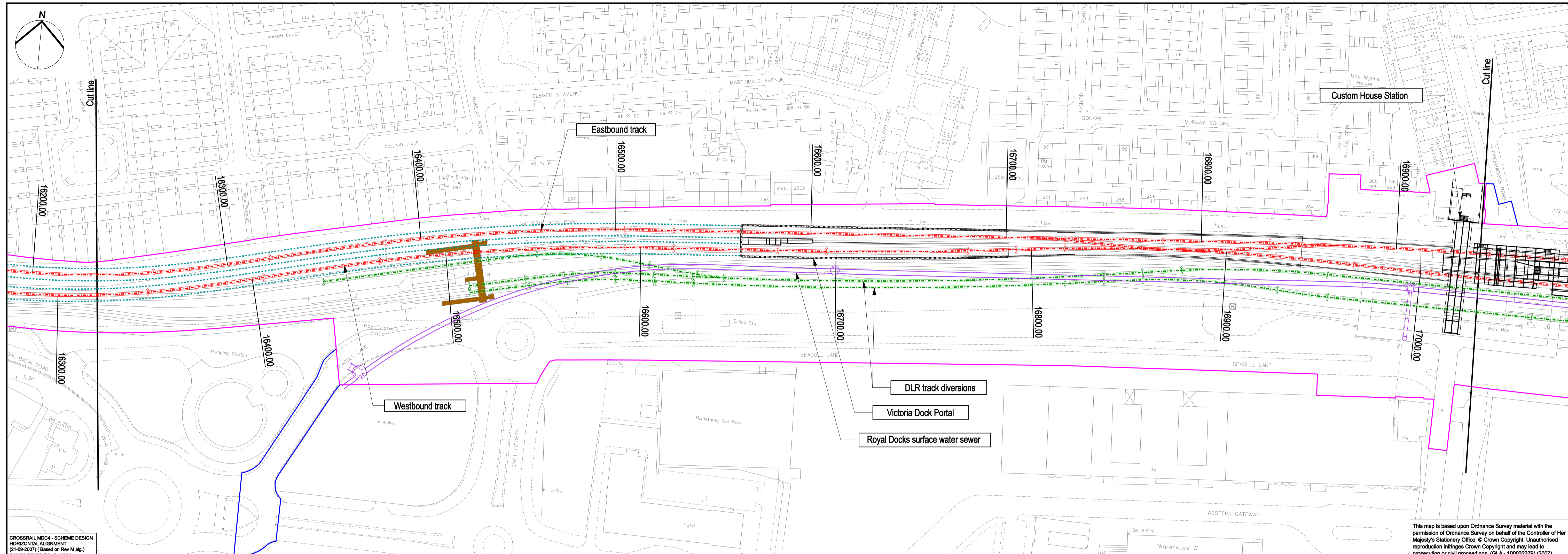


## **8 Figures**

Figure1\_VDP\_P40100-C1M00-C00-D-00108.pdf

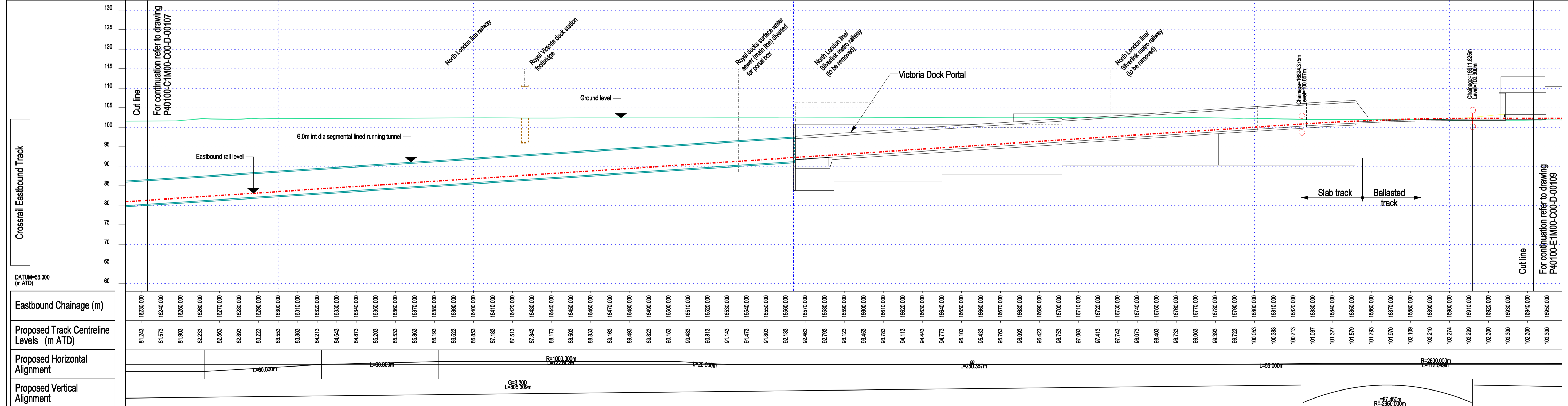
Figure1\_Custom House\_P40100-E2M00-C00-D-00109.pdf

Figure 2 VIC\_GLSMR\_211207\_LOCATIONS.pdf



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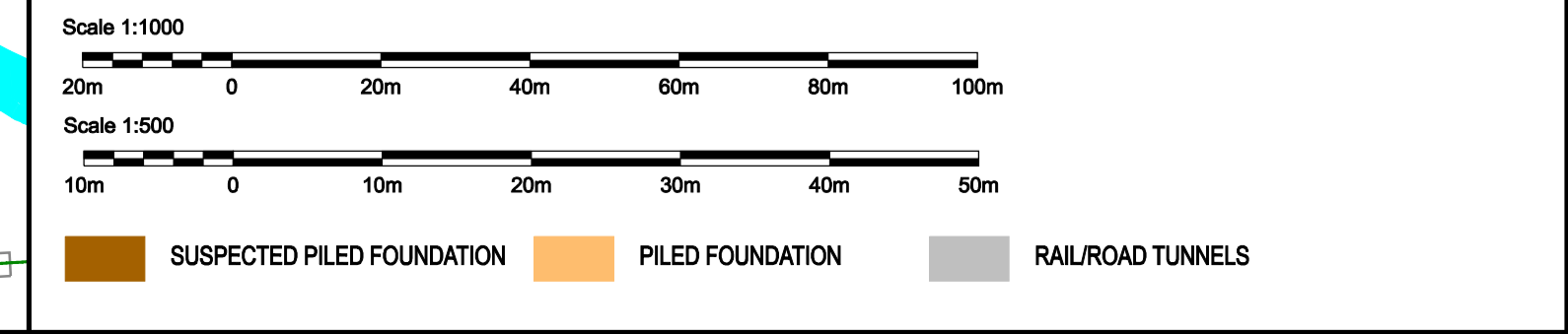
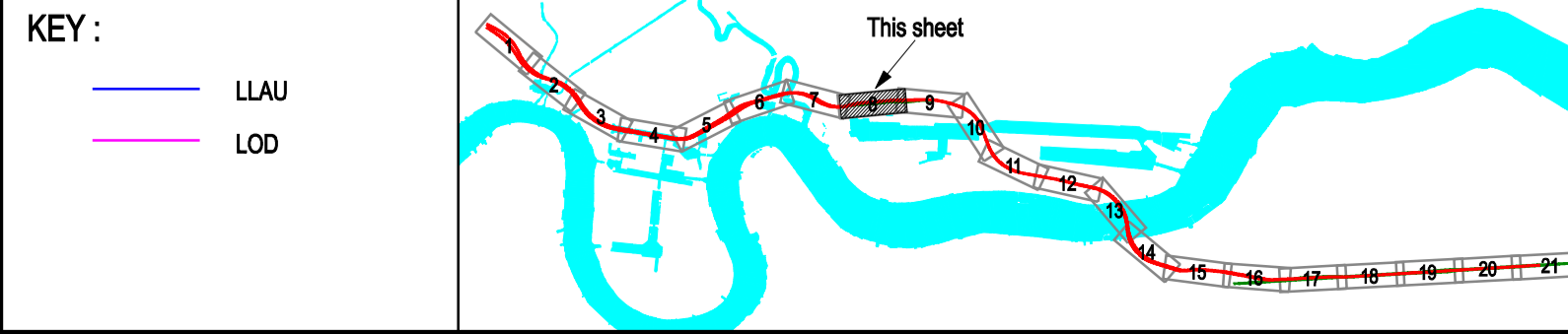
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|-----|----------|----------------------------------|-----|------|-----|-----|-----|
| A   | 15/11/06 | INITIAL REFERENCE DESIGN         | ARN | MB   | RPM |     |     |
| B   | 30/11/06 | INITIAL REFERENCE DESIGN UPDATED | ARN | MB   | RPM |     |     |
| C   | 20/11/07 | SCHEME DESIGN ISSUE              | ARN | MB   | RPM |     |     |



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## Appendix 1 – Gazetteer

| Pref Ref     | Name                                     | Mon Type      | Date Range                                           | Easting                              | Northing                             |
|--------------|------------------------------------------|---------------|------------------------------------------------------|--------------------------------------|--------------------------------------|
| 060582/00/00 | Royal Victoria Dock Customhouse E16, Axe | Findspot      | Palaeolithic 500000 BC to 10001 BC                   | 541054                               | 180594                               |
| 061744/00/00 | Plaistow Marshes Plaistow E13, Spearhead | Findspot      | Bronze Age 2200 BC to 701 BC                         | 540405                               | 181405                               |
| 061758/00/00 | Royal Victoria Pontoon Dock E16, Axe     | Findspot      | Prehistoric 500000 BC to 42 AD                       | 541134                               | 180344                               |
| 061759/00/00 | Royal Victoria Dock Customhouse E16, Axe | Findspot      | Bronze Age 2200 BC to 701 BC                         | 541054                               | 180594                               |
| 061790/00/00 | Prince Regent L/A Beckton E16            | Manor House   | Medieval to 17th Century 1066 AD to 1600 AD          | 541455                               | 180855                               |
| 062197/00/00 | King George Ave (Custom Ho )             | Ditch         | Post Medieval 1540 AD to 1900 AD                     | 541655                               | 181204                               |
| 062475/00/00 | Baxter Rd E16                            | Peat, Peat    | Bronze Age 2200 BC to 701 BC                         | 541584                               | 181125                               |
| 062476/00/00 | Baxter Rd E16                            | Water Channel | Bronze Age 2200 BC to 701 BC                         | 541584                               | 181125                               |
| 062477/00/00 | Baxter Rd E16                            | Flood Deposit | Early Bronze Age to Post Medieval 2200 BC to 1900 AD | 541584                               | 181125                               |
| 062483/00/00 | Royal Victoria Dock                      | Water Channel | Unknown                                              | 540700<br>540500                     | 181000<br>180500                     |
| 062484/00/00 | Royal Victoria Dock                      | Water Channel | Unknown                                              | 541000<br>541000                     | 180500<br>181000                     |
| 062493/00/00 | Butchers Rd (Corner With )               | Peat          | Bronze Age 2200 BC to 701 BC                         | 540500<br>540450<br>540485<br>540505 | 181450<br>181465<br>181517<br>181470 |
| 062494/00/00 | Butchers Rd (Corner With )               | Peat          | Late Bronze Age to Early Iron Age 1000 BC to 401 BC  | 540450<br>540505<br>540500<br>540485 | 181465<br>181470<br>181450<br>181517 |



|              |                                                       |                                 |                                                               |                                      |                                      |
|--------------|-------------------------------------------------------|---------------------------------|---------------------------------------------------------------|--------------------------------------|--------------------------------------|
| 062495/00/00 | Butchers Rd<br>(Corner With )                         | Peat                            | Iron Age 700<br>BC to 42 AD                                   | 540505<br>540485<br>540450<br>540500 | 181470<br>181517<br>181465<br>181450 |
| 062650/00/00 | Barnwood Ct                                           | Peat, Peat                      | Early Neolithic<br>to Late Bronze<br>Age 4000 BC<br>to 701 BC | 540615                               | 180195                               |
| 062651/00/00 | Barnwood Ct                                           | Flood Deposit                   | Bronze Age<br>2200 BC to<br>701 BC                            | 540615                               | 180195                               |
| 062673/00/00 | Eastwood Rd<br>E18                                    | Quarry                          | Unknown                                                       | 540254                               | 180244                               |
| 062674/00/00 | Eastwood Rd<br>E18                                    | Yard, Dump                      | Post Medieval<br>1540 AD to<br>1900 AD                        | 540254                               | 180244                               |
| 062675/00/00 | Eastwood Rd<br>E18                                    | Culvert                         | Post Medieval<br>1540 AD to<br>1900 AD                        | 540254                               | 180244                               |
| 062697/00/00 | Boxley St E16                                         | Flood Deposit,<br>Peat          | Unknown                                                       | 540664                               | 180224                               |
| 062804/00/00 | St Lukes<br>School Land<br>Adjacent To                | Negative<br>Evidence            | Unknown                                                       | 539855                               | 181305                               |
| 062903/00/00 | 2-48 Coolfin<br>Rd                                    | Negative<br>Evidence            | Unknown                                                       | 540425                               | 181145                               |
| 221639/00/00 | Victoria Dock<br>Rd                                   | Dock                            | Post Medieval<br>1540 AD to<br>1900 AD                        | 541005                               | 180504                               |
| MLO76393     | Royal Docks<br>Community<br>School Site,<br>Microlith | Buried Soil                     | Early Neolithic<br>to Late Bronze<br>Age 4000 BC<br>to 701 BC | 541304                               | 181104                               |
| MLO77307     | Royal Docks<br>Community<br>School Site               | Ard Marks?                      | Unknown                                                       | 541304                               | 181104                               |
| MLO77308     | Royal Docks<br>Community<br>School Site               | Cooking Pit                     | Prehistoric<br>500000 BC to<br>42 AD                          | 541304                               | 181104                               |
| MLO77309     | Royal Docks<br>Community<br>School Site               | Pit                             | Prehistoric<br>500000 BC to<br>42 AD                          | 541304                               | 181104                               |
| MLO77310     | Royal Docks<br>Community<br>School Site               | Post/Stake<br>Hole<br>Alignment | Prehistoric<br>500000 BC to<br>42 AD                          | 541304                               | 181104                               |
| MLO77311     | Royal Docks<br>Community<br>School Site               | Gully                           | Prehistoric<br>500000 BC to<br>42 AD                          | 541304                               | 181104                               |
| MLO77312     | Royal Docks<br>Community<br>School Site               | Ditch                           | Medieval 1066<br>AD to 1539<br>AD                             | 541304                               | 181104                               |



|          |                                       |             |                                                          |        |        |
|----------|---------------------------------------|-------------|----------------------------------------------------------|--------|--------|
| MLO77313 | Royal Docks Community School Site     | Peat        | Late Neolithic to Early Bronze Age<br>3000 BC to 1501 BC | 541304 | 181104 |
| MLO98113 | Leslie Road (81), Newham, E16         | Made Ground | Unknown to 19th Century                                  | 540791 | 181122 |
| MLO98302 | Victoria Dock Road (118), Newham, E16 |             |                                                          | 539847 | 180878 |



## **Appendix 2 – Deposit Model Report**



**CROSSRAIL**  
**MDC4 ARCHAEOLOGY**  
**GEOARCHAEOLOGICAL DEPOSIT MODEL:**  
**VICTORIA DOCK PORTAL**  
**JANUARY 2008**

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**MUSEUM OF LONDON**

**Archaeology Service**

31/01/2008

# 1 Geoarchaeological deposit model: Victoria Dock Portal

## 1.1 Introduction

### 1.1.1 *Landscape Zones*

In very broad terms the sub-surface deposits present in the area of the Victoria Dock Portal (VDP) comprise low-elevation alluvial silty clays related to deposition in a series of relatively small braided channels flowing through marshlands at the margins of the main River Thames floodplain. This network of channels appears to occupy a distinct east–west zone within the study area and it is possible that this constituted a separate network of channels (braidplain) from the main Thames floodplain. This braided channel environment is surrounded by areas of high ground formed as sand and gravel bars, within and marginal to the river environment, and areas marginal to the braidplain which supported well-developed wetland vegetation. Through the study of the relationship (both horizontally and vertically) of the various sediments types, and the depositional environments which they represent, the area under assessment has been divided into landscape zones (LZs). These zones facilitate assessment of the potential of these areas for the preservation of archaeological and palaeoenvironmental material.

### 1.1.2 *Reliability of the model*

The surface model used to define the landscape zones is derived from borehole data from sites which are not uniformly spaced across the study area. Though much of the central and western region of the area under study contains boreholes spaced at a sufficiently fine spatial resolution to accurately model the sub-surface topography, some areas suffer from a lack of data, thus reducing the reliability of the surface model to some extent. This is most pertinent to the area occupied by landscape zones 2 and 4 in the central and south-central region of the study area, where the paucity of borehole data could mean that though the general trend of the model towards low-elevation land in this area is correct, any topographic features which fall outside that general trend (eg sand and gravel highs) may not necessarily be highlighted by the model.

## 1.2 Higher drier ground (LZ1)

This area lies in the northern region of the study area, and has **good potential for Mesolithic to Roman archaeological dry-land remains**, and may contain features cut into the underlying sub-surface deposits (surface of sand and gravels, and possibly lowermost fine-grained alluvium). However, as this marginal area of the Thames floodplain would have been exposed as dry land for much of the prehistoric and historic periods, biological material used to help generate palaeoenvironmental data, as well as organic artefacts such as bone tools and wooden structures, are unlikely to be preserved.

LZ1 covers the north-central area of the Victoria Dock Portal (VDP), and consists of higher ground with elevations of the Pleistocene gravel surface ranging from c 98 to



99m LUL (LUL Datum = OD +100m). This high ground probably relates to the very beginning of the incline up towards the high terrace ground to the north. In borehole ARC/cfn99ev (north–south transect; Fig XX), fine-grained silts and clays probably relate to historic alluviation and may seal any cut features which may extend down into the surface of the basal sands and gravels.

### **1.3 Deeper channel areas (LZ2)**

LZ2 comprises the central east–west section of the study area, and is characterised by generally low-lying land, probably associated with a network of braided channels flowing across this area of the Thames floodplain from the late Pleistocene/early Holocene, to historic periods. There is **reasonable potential for prehistoric to Roman archaeological remains in the form of boats, and subsistence equipment related to fishing and the exploitation of the Thames floodplain** in this landscape zone. However, this area is key in our understanding of the changing behaviour of fluvial systems occurring during dramatic changes in climate regime (ie glacial – interglacial episodes). Such an understanding is not only important in its own right, but if associated with evidence for human activity, allows for the elucidation of the interaction between past human populations and these landscape features.

At present, the River Thames is a single channel meandering river, situated some 300m to the south and south-west of the study area. Following the last glaciation, the Thames was formed of a series of smaller interconnected channels surrounded by a wide expanse of marshlands and higher, drier sand and gravel bars. These channels migrated back and forth across the Thames floodplain, switching between active, flowing channels, and cut-off channels prone to sediment infilling. This landscape zone would not have been an accessible environment except by water craft and would have presented a formidable barrier against access further south into the floodplain.

Sediments associated with this landscape zone are dominated by fine-grained minerogenic sediments related to deposition in generally slow-moving braided channels. However, as can be seen in borehole B30 (east-west transect, Fig XX), some of these channels may have been faster flowing, evidenced by the sandier content of the sediments which suggest a higher flow speed. Whereas peat is often well developed (and preserved) in areas marginal to the main network of braided channels (braidplain), in the low lying areas of LZ2 peat development is rarely encountered, and most likely often vertically truncated through erosion. The fine-grained channel-fill sediments commonly observed in this landscape zone are highly conducive to the preservation of organic material, and so these sediments have high potential for the preservation of palaeoenvironmental material, such as molluscs, insects and pollen, all of which can be examined in order to recreate the changing environment in which past human populations existed.

In contrast to the relatively coarse channel sediments recorded in borehole B30, which indicate that this channel remained active probably throughout much of the early and mid Holocene, those observed in borehole B242 comprise well humified, organic clay. This suggests that these sediments were deposited in a channel marginal area where channel-flow was minimal and weakly developed vegetation managed to take hold periodically. This area of LZ2 may therefore have been a slackwater, ponded area close to the higher ground to the north.

Borehole records in this zone indicate that the channels flowed in this area from the early Holocene/Mesolithic periods right up until the historic period. Indeed, it is possible that this low lying, partially silted-up area of the Thames floodplain, was targeted as a suitable area to construct the Victoria Docks which broadly coincide with LZ2.

River valleys would have been targeted during prehistoric periods by hunter-gatherer-fisher groups in particular, as locations of water and diverse food resources and such activity was often focused in marginal areas adjacent to the stream channels themselves. Thus there is also potential for evidence of such wetland activity from the Mesolithic and onwards to be found in this landscape zone. Such evidence might include organic artefacts and structures associated with river crossings, fish traps and boats.

#### **1.4 Sand and Gravel ‘Islands’ (LZ3)**

Areas where the surface of the Pleistocene gravel and sand are relatively high constitute the landscape of LZ3. These ‘islands’ of sand and gravel are important in our understanding of the exploitation of the Thames floodplain during the prehistoric periods as they are likely to have remained higher and drier above the marshy environment of the channel marginal area (LZ4), and could therefore have **good potential for evidence of dry-land prehistoric and later human activity**.

In LZ3 areas, the sub-surface stratigraphy comprises gravel and sand islands which have a surface elevation ranging from *c* 98 to 99m LUL. At the beginning of the Holocene (early Mesolithic) it is likely that the Thames river level was significantly lower than that of the present day, possibly up to 15m lower (Bates and Whittaker 2004). However, during the course of the early to mid Holocene, rapidly rising sea levels (related to the unlocking of polar ice) caused the Thames to rise to approximately 97m LUL by the Mesolithic/Neolithic transition (Bates and Whittaker 2004). Given the elevation of the sand and gravel in boreholes in LZ3, these areas of high ground would have remained above river levels at least throughout the Mesolithic period, and possibly through at least the early part of the Neolithic, and would have been attractive areas of the floodplain for carrying out subsistence activities such as hunting and fishing. It is possible that makeshift camps would have been constructed on some of the larger islands, which might have served as a base from where such activities took place.

In two of the boreholes CH22 and BWC96-BH8 (north-south and east-west transects; Figs XX and XX), a layer of very well humified, sandy peat was observed directly overlying the gravel islands, and it is possible that these semi-organic layers represent weakly developed Mesolithic soils, adding further support to the possible presence of early prehistoric dry-land surfaces. Such buried land-surfaces have potential for the accumulation and preservation of archaeological material, such as lithic scatters – the bi-product of the manufacture of stone tools. Such Mesolithic ephemeral soils have been observed in this area of the Thames floodplain and have been consistently dated to the Mesolithic (eg Morley 2003).

Depending on the elevation and the position of these sand and gravel islands within the floodplain, there is also potential for these areas of high ground to have remained dry-land during the Neolithic and Bronze Age periods. To the south of the study area, a gravel island with an upper surface lying at approximately 99m LUL is likely contiguous with the large area of LZ3 in the south central region of the study area. At Fort Street, 100m to the south of the study area, a timber trackway of Neolithic age was found associated with this gravel high, at an elevation of 99m LUL (Wessex Archaeology 2000). This trackway was thought to have been used to link areas of high ground which were separated by lower lying, wet and marshy areas not easily accessible to prehistoric people traversing the Thames floodplain.

Peats and humic silts often directly overlie the Pleistocene gravels and sands and testify to further rises in the Thames during the later Holocene (later prehistoric/historic periods). These peats indicate that infilling of channels in the braidplain continued until much of the entire area of this part of the Thames formed a semi-terrestrial marshland environment, which probably existed into post-Medieval times.

### **1.5 Marginal semi-terrestrial marshlands (LZ4)**

LZ4 is essentially the transitional environment between the higher ground of the sand and gravel islands (as well as the higher ground to the north), and the network of channels associated with the east-west braidplain. This landscape zone is characterised by thick, well-developed peats which testify to an increase in wetland vegetation at the margins of the main channel network. **LZ4 has reasonable to good potential for the recovery of prehistoric wetland archaeological remains (such as Bronze Age timber trackways or platforms), and excellent potential for the recovery of organic remains with palaeoenvironmental significance.**

Much of the peat found in this landscape zone is highly woody and fibrous and shows that moisture-tolerant vegetation existed at the margins of the Thames floodplain (and associated smaller marginal braidplains), primarily as alder-carr vegetation assemblages, most likely with a ground flora of sedges and ferns. Oak, elm, ash and lime trees were probably also growing in these marginal areas (Morley 2003), but these may not have been strongly developed in more channel proximal locations.

The environment of LZ4 may have been partially accessible to prehistoric people hunting, fishing and foraging along the margins of the Thames floodplain, but there would have been issues with both the density of the vegetation, which may have proved impenetrable in places, and the boggy nature of the ground surface. Prehistoric people would have probably tried to utilise higher ground where available, but the dense tangle of vegetation most likely represented by the well-developed peat units, may also have served as useful cover whilst tracking and hunting animals.

Owing to the highly organic nature of the sediments in this landscape zone, there is very good potential for the preservation of palaeoenvironmental remains such as wood, nuts and pollen, as well as organic archaeological material such as wood and bone tools.

## 1.6 References

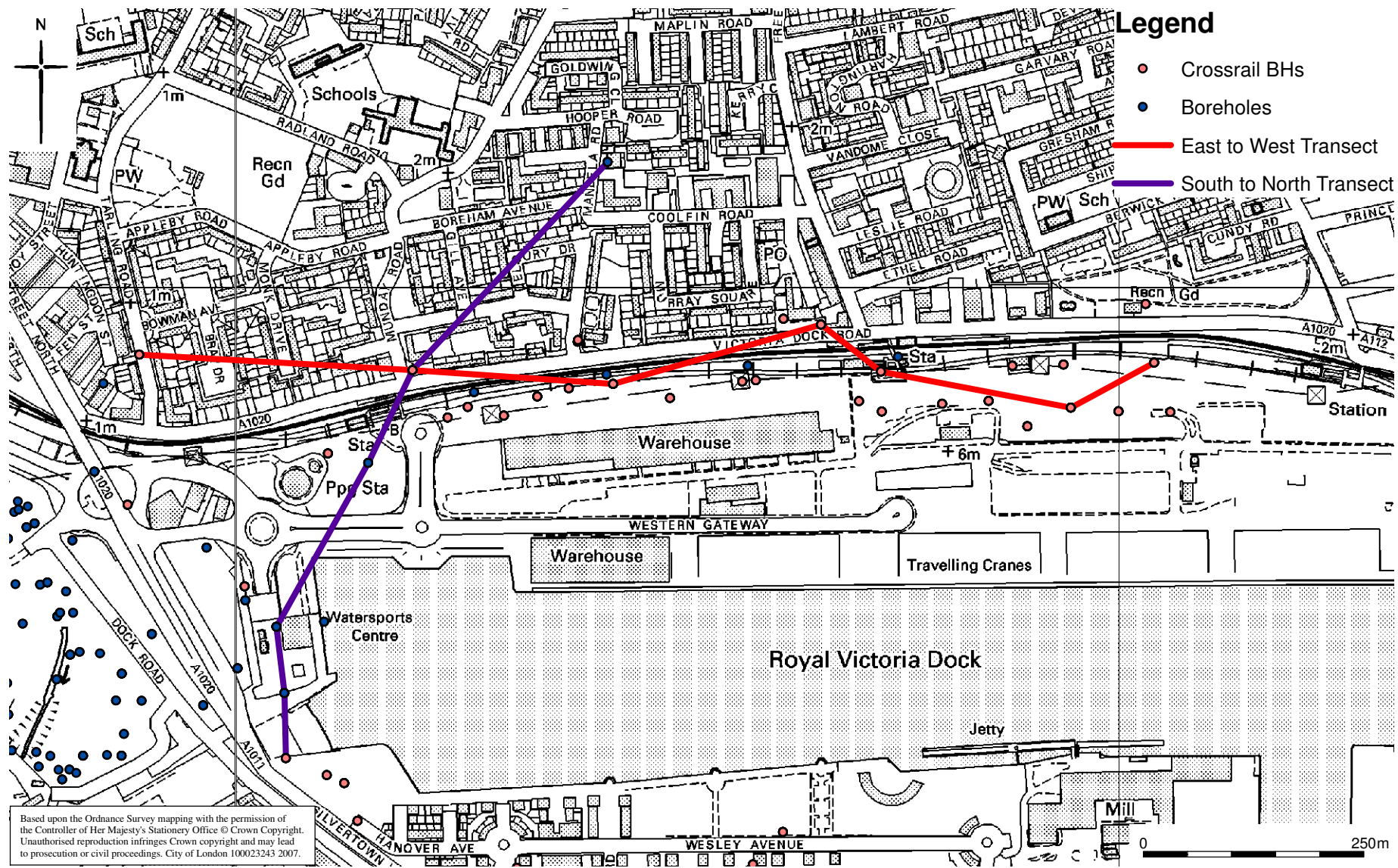
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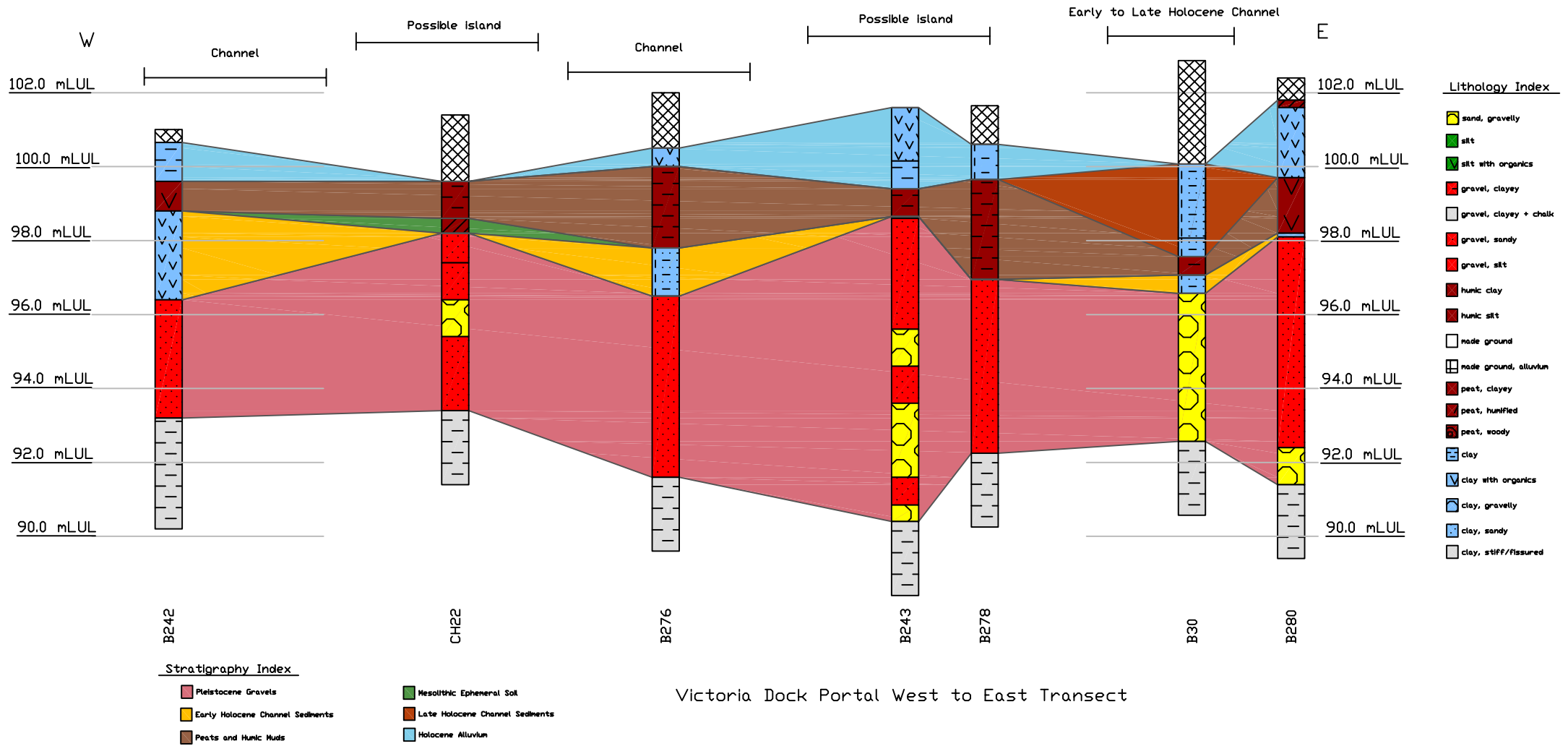


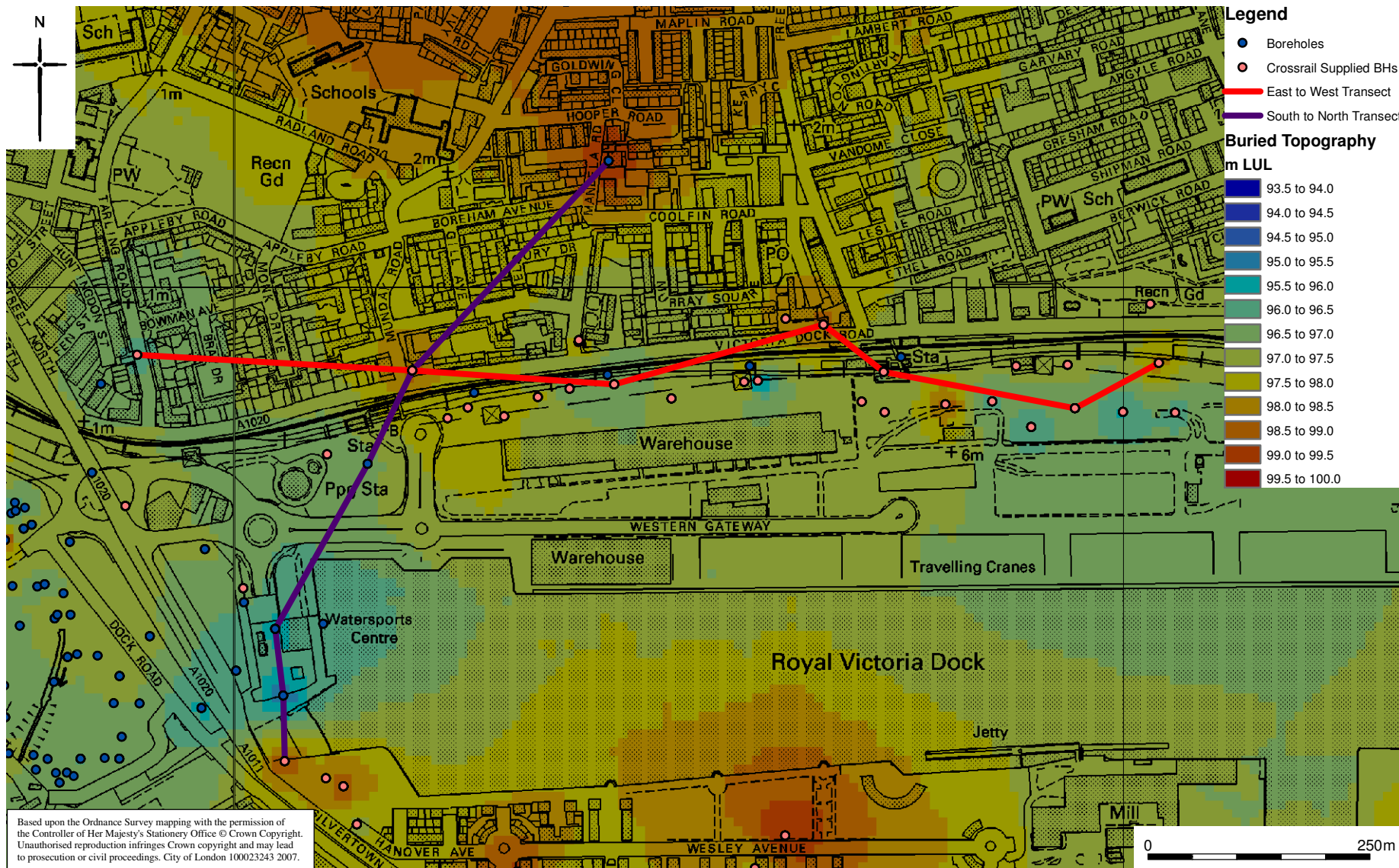
## **Appendix 3 – Deposit Model**



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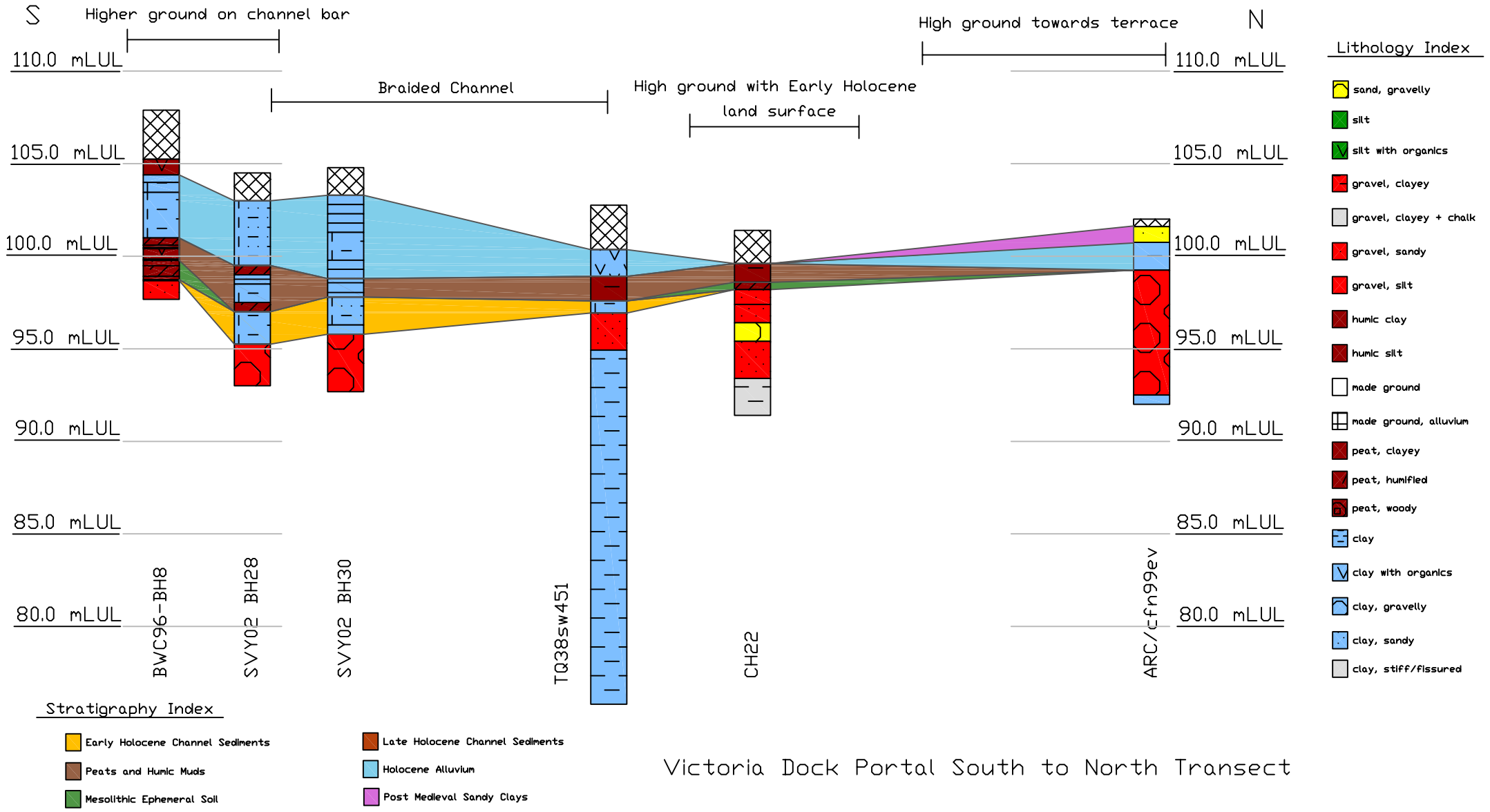
Borehole and Transect Location

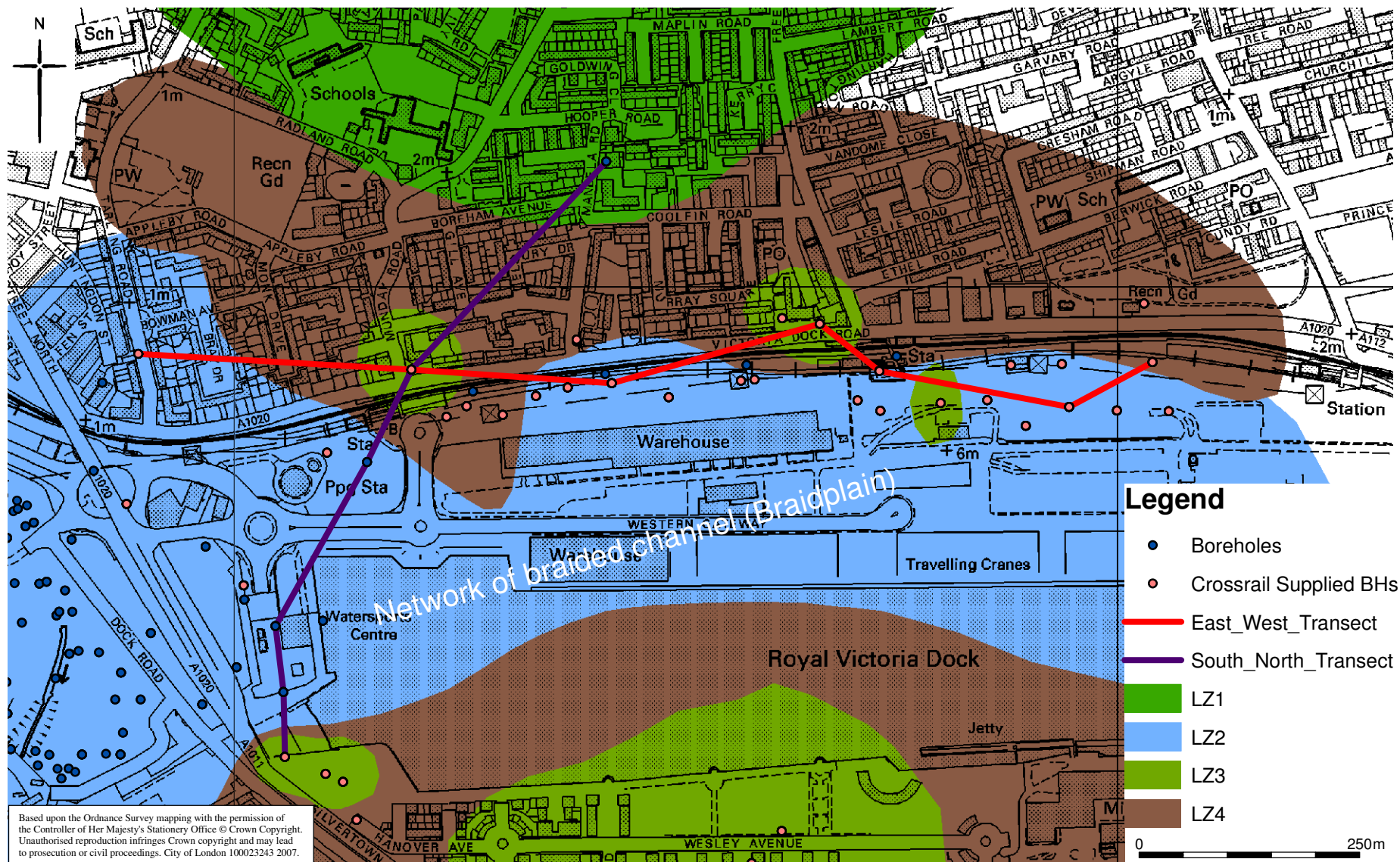




Buried Topography







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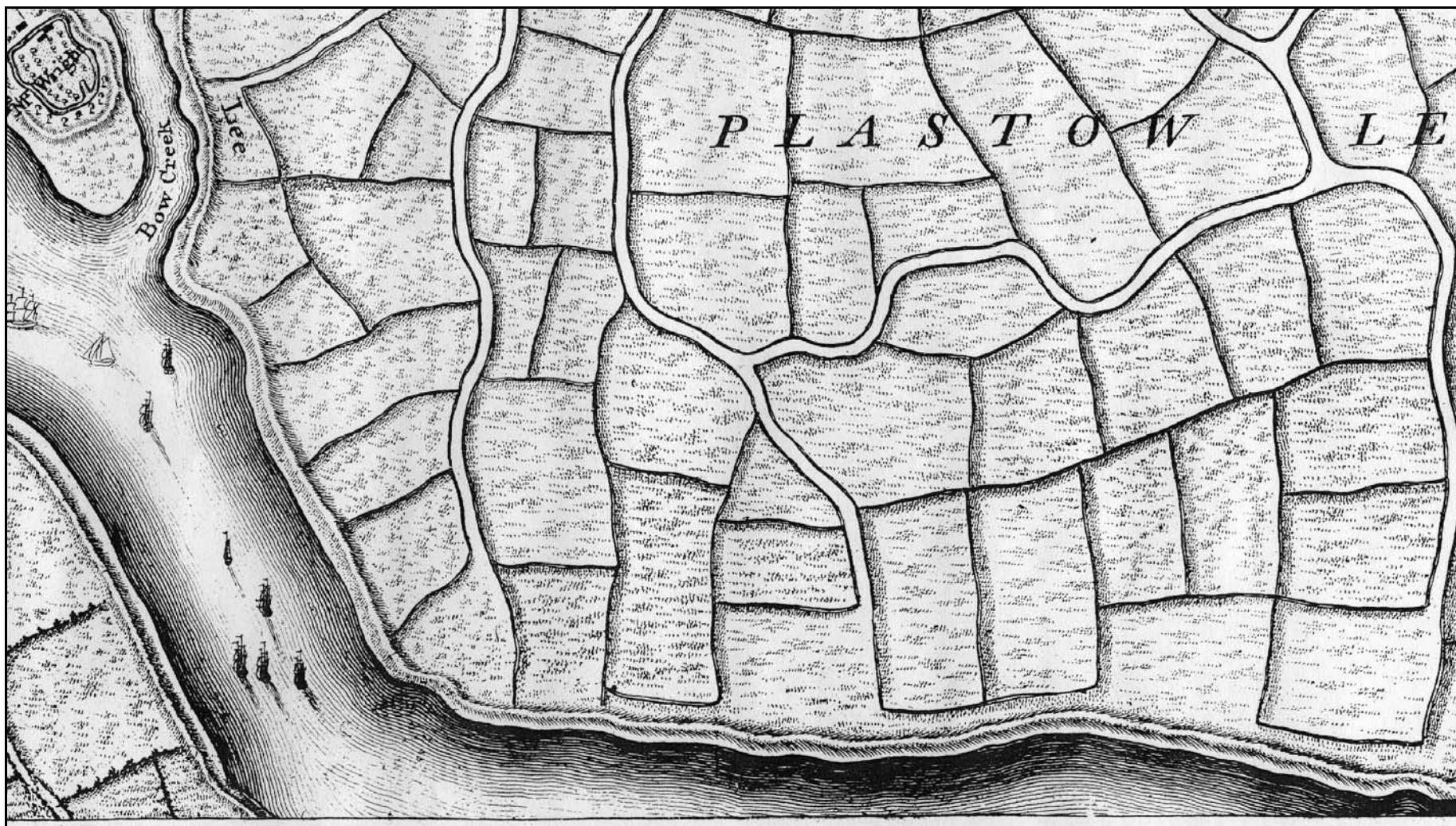
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Archaeological Potential



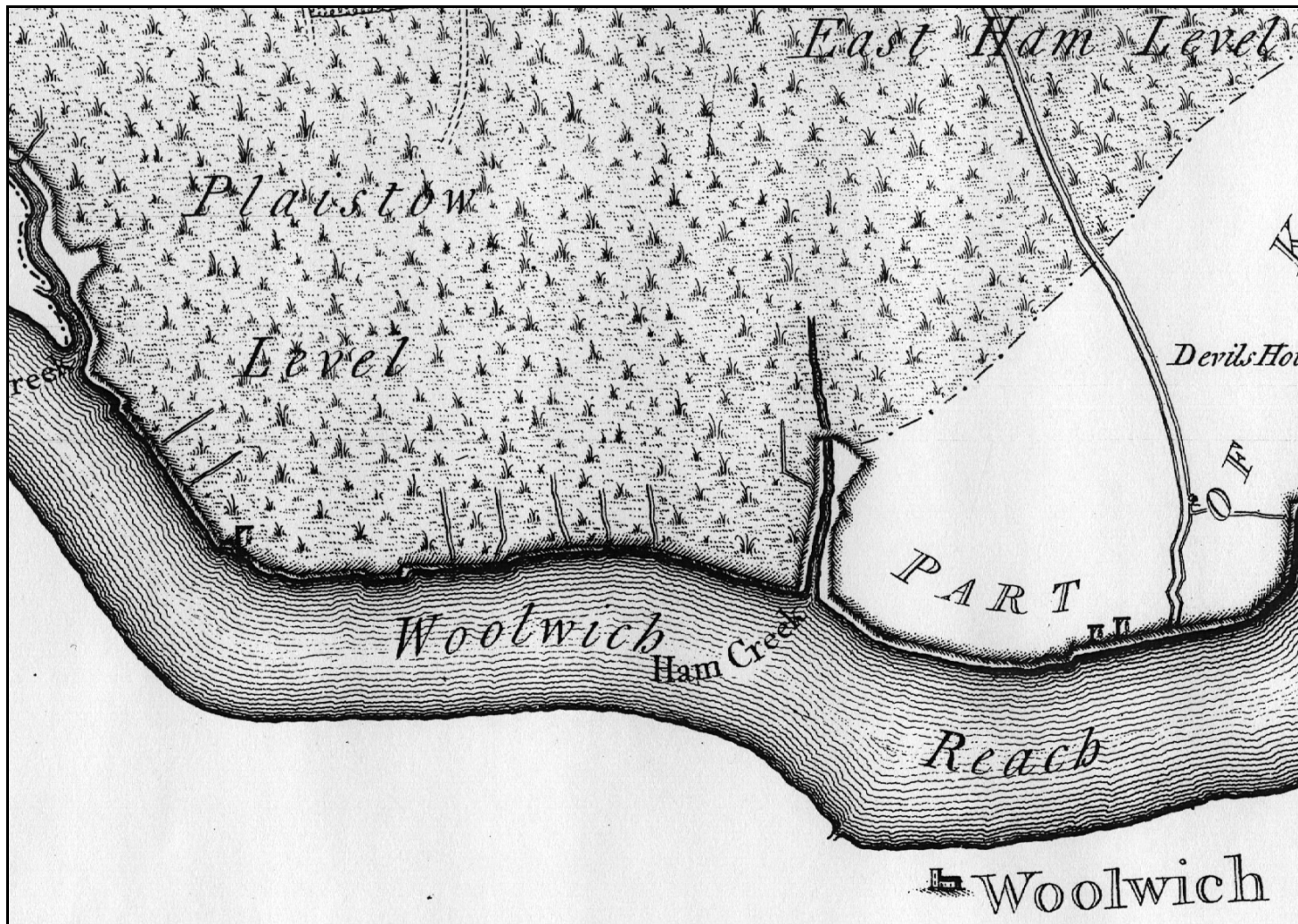
## **Appendix 4 – Historic Maps**

Appendix 4 - Royal Victoria Dock. Detailed Desk Based Assessment



1746 Rocque Map

Appendix 4 - Royal Victoria Dock. Detailed Desk Based Assessment



1777 Andre and Chapman Map

Appendix 4 - Royal Victoria Dock. Detailed Desk Based Assessment



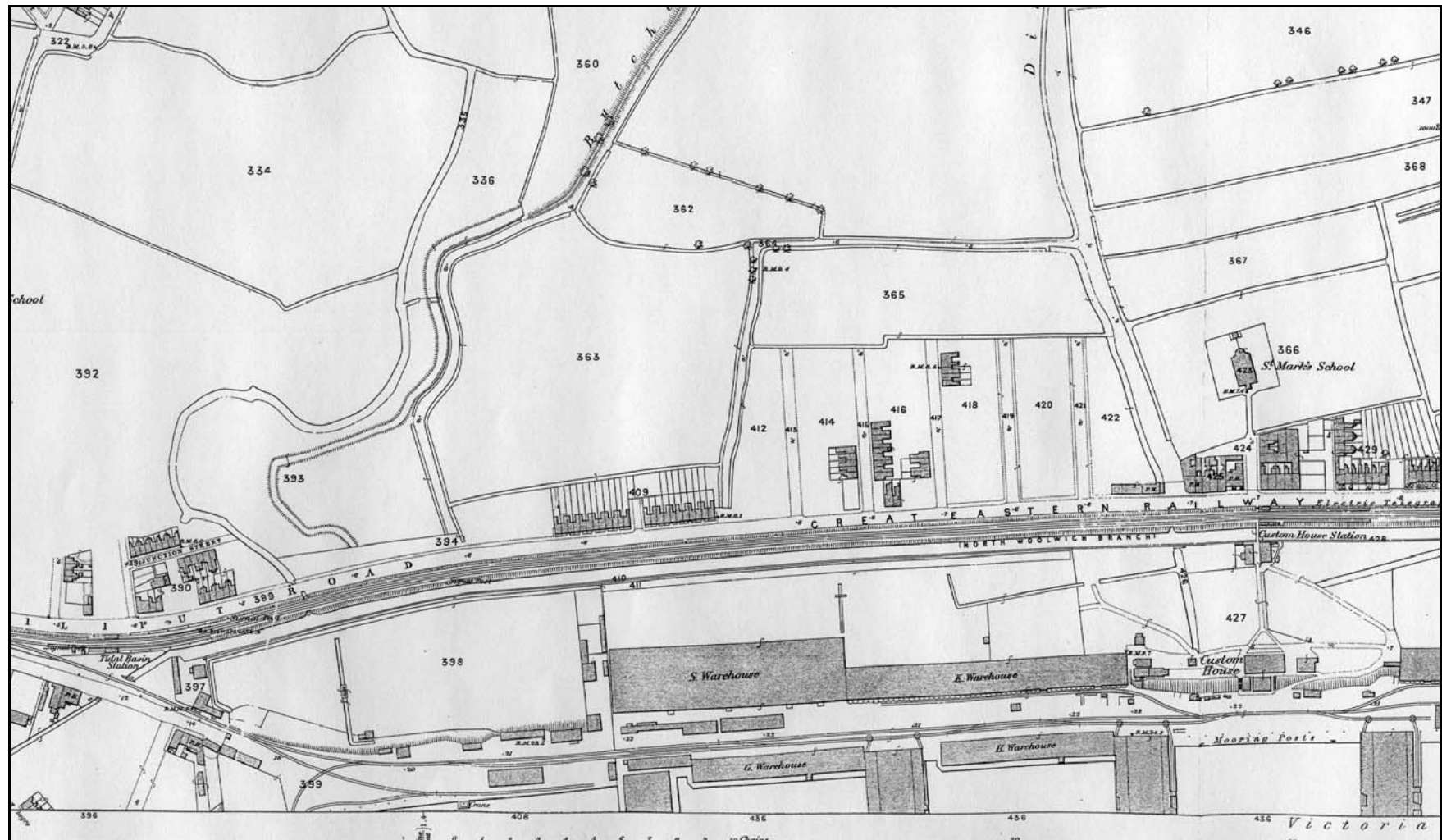
1799 Ordnance Survey Map

Appendix 4 - Royal Victoria Dock. Detailed Desk Based Assessment



1844 Ordnance Survey Map

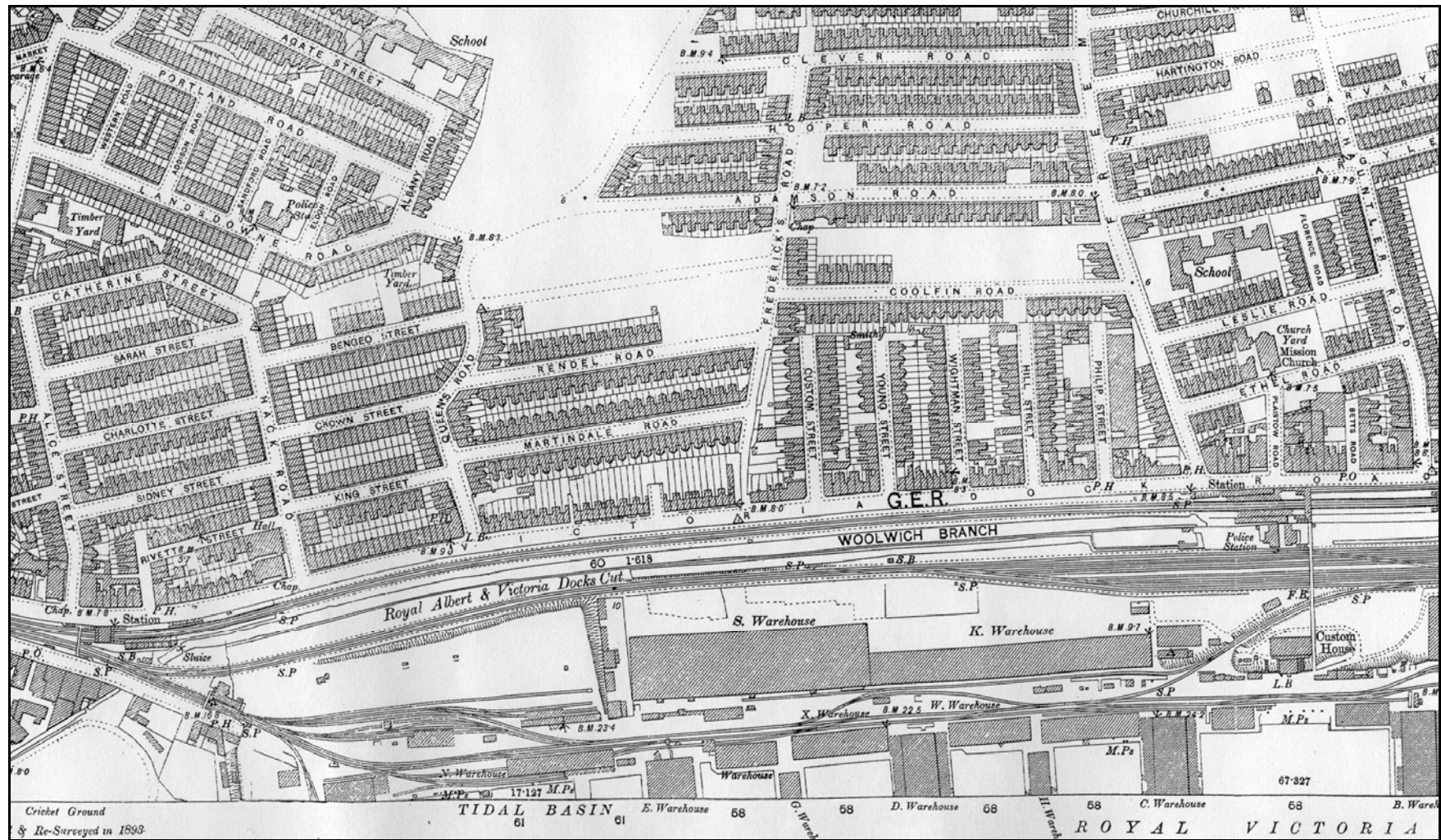
Appendix 4 - Royal Victoria Dock. Detailed Desk Based Assessment



1867 Ordnance Survey Map

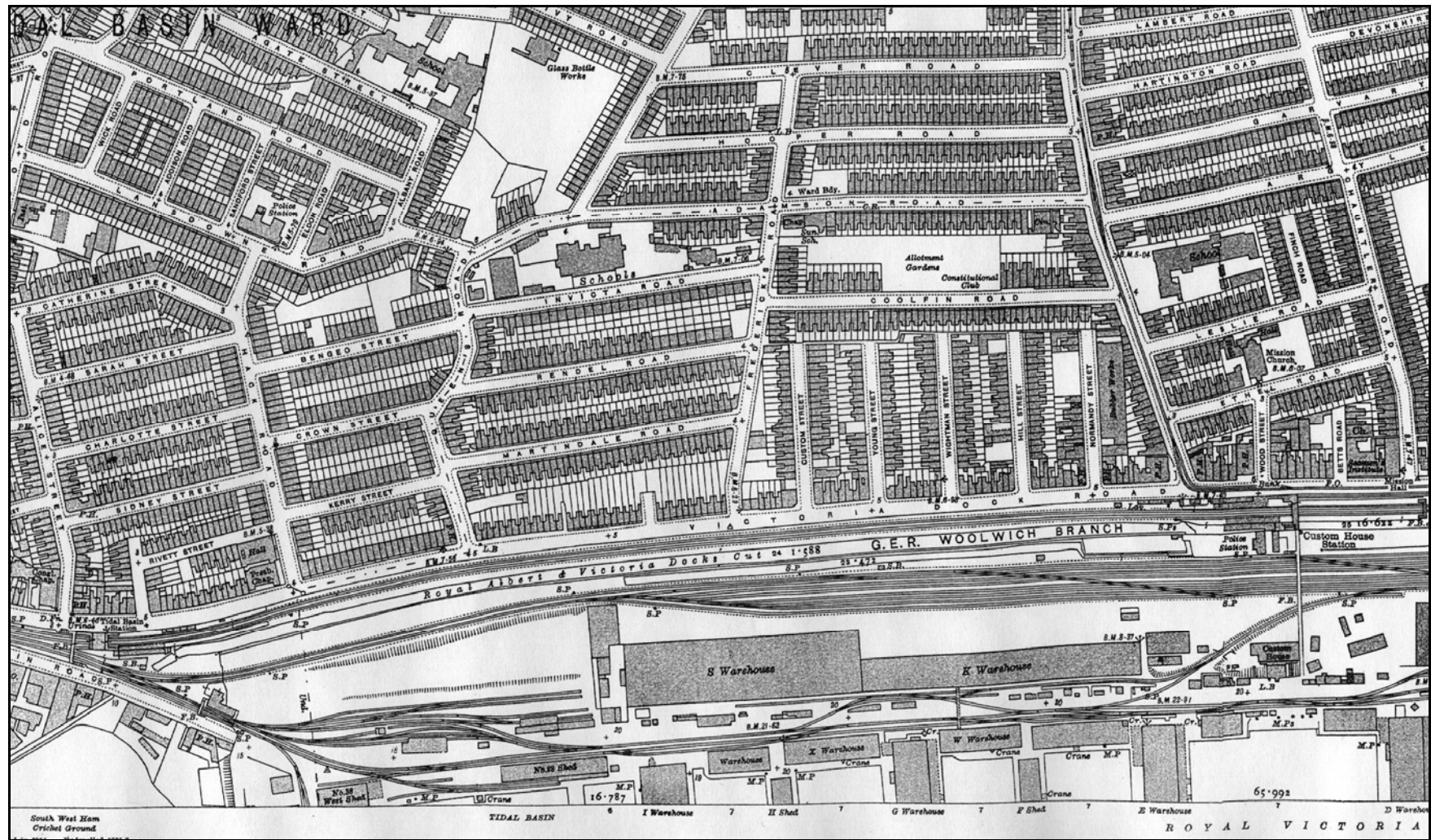


Appendix 4 - Royal Victoria Dock. Detailed Desk Based Assessment



1894 Ordnance Survey Map

Appendix 4 - Royal Victoria Dock. Detailed Desk Based Assessment



1914 Ordnance Survey Map



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