C263 LATE EAST SECTION PROJECT

Fieldwork Report

Archaeological Watching Brief on Utility Diversions at

North Woolwich Portal (XSV11)

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Non technical summary

This report presents the results of archaeological watching briefs carried out by the Museum of London Archaeology (MOLA) on the North Woolwich Portal worksite, in the London Borough of Newham. This report was commissioned from MOLA by Crossrail Ltd. This work is being undertaken as part of a wider programme of assessment to quantify the archaeological implications of railway development proposals along the Crossrail route.

The worksite at the North Woolwich Portal site (part of Crossrail contract C263 Archaeology Late East) consists of utility diversions centred around Albert Road and Factory Road.

The North Woolwich portal site lies within an Archaeological Priority Area. There are no scheduled monuments or listed buildings within the site. The potential for palaeoenvironmental and topographic evidence within the alluvium and peat sequence was moderate to high. However, the watching brief has not identified any archaeological remains within the deeper excavated utility diversion trenches and associated manholes which were excavated to a depth of c3.0-4.0m. No archaeological structures or associated features indicative of human occupation/habitation were observed. Naturally occurring wood preserved within the minerogenic alluvium deposits was of limited archaeological significance. A series of 19th/20th century dump layers/levelling deposits comprising rubble construction building material and burnt material were observed by the Tate and Lyle Sugar Factory along Factory Road within the upper made ground. These deposits lay to a maximum depth of 2.0m bgl. These are likely to represent the foundations for the earliest roadway or for the construction of the North London line railway established here in 1847.

Areas of high archaeological potential were not identified during the utility diversion watching briefs. The deposits excavated and records made are interpreted as being of low importance. Therefore the general watching brief results have not provided any additional information in regards to the locating and undertaking of the 4 trial trenches at North Woolwich Portal.

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1 Introduction

Crossrail is a new cross London rail link project which will provide transport routes in the south east and across 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 the south-east spur works a portal at North Woolwich will be required.

The Crossrail mitigation response to archaeology is described in the Crossrail Generic WSI (Crossrail 2009) and the detailed desk based assessment (DDBA; Crossrail 2008), and can be summarised as follows:

- In the event that intact and important archaeological remains are identified at Crossrail worksites through this process, it may be preferable, where practicable, to preserve these where they are found (i.e. preservation in situ).
- However, because of the nature of major works projects such as Crossrail, experience of other similar projects suggests that preservation by record is usually the most appropriate method of dealing with archaeological finds.
- Following an extensive Environmental Impact Assessment (EIA) supporting the Crossrail Bill, and the production of site-specific DDBAs, appropriate mitigation measures were scoped and specified in detail in individual project designs (site-specific WSIs – Written Schemes of Investigation) which were prepared in accordance with the principles set out in the Generic WSI, and developed in consultation with the relevant statutory authorities. The requirements for North Woolwich Portal were set out in the WSI (Crossrail 2008). The methodology for archaeological investigations to be undertaken at North Woolwich Portal by Museum of London Archaeology was set out in the Method Statement (MOLA 2011).
- Archaeological information that is gained from fieldwork will be followed by analysis and publication of the results and will be transferred to an approved public receiving body.

This fieldwork report describes the results of a general watching brief on utility diversions around the North Woolwich Portal worksite monitored by Museum of London Archaeology (MOLA) under Crossrail contract C263 Archaeology East. The North Woolwich Portal site is situated on National Grid reference (NGR) 542700 180000. It lies within the existing railway corridor of the former North London Line (NLL), between Factory Road and Albert Road. The portal itself will be located between the junction of Tate Street with Albert Road and Henley Street with Factory Road, in the London Borough of Newham (Fig 1).

All levels in this document are quoted in metres Above Tunnel Datum (m ATD). To convert Tunnel Datum to Ordnance Datum subtract 100m, i.e. 1m OD = 101m ATD.

All fieldwork was conducted between 04/07/11 and 30/03/12. It was supervised by MOLA Supervisors Matt Ginnever, Greg Laban, Robert Hartle and Rachel English, and included the following activities:

Task	FDC Notification	Principal Contractor	Programme
• **General Watching Brief NWP** (Sewer, water and gas mains, EDF and ICT diversions on Albert Road)	N/A	C233 J Murphy & Sons	04/07/11 - 30/03/12
• **General Watching Brief NWP** (Sewer, water and gas mains, BT, Virgin, EDG and interoute diversions on Factory Road)	N/A	C233 J Murphy & Sons	04/07/11 and 30/03/12

Table 1 Archaeological Investigations

The event code (site code) is **XSV11**.

2 Planning background

The legislative and planning framework in which all archaeological work took place was summarised in the Site Specific Written Scheme of Investigation (SS-WSI): *C156 – North Woolwich Portal Site-Specific Archaeological Written Scheme of Investigation,* Doc. No C156-CSY-T-RGN-CR146_PT004-00019, Version 8.0, January 2011; a brief summary is included here:

The overall framework within which archaeological work will be undertaken is set out in the Environmental Minimum Requirements (EMR) for Crossrail (http://www.crossrail.co.uk/therailway/ getting-approval/parliamentary-bill/environmental-minimum-requirements-includingcrossrail- construction-code). The requirements being progressed follow the principles of Planning Policy Guidance Note 16 on archaeology and planning (1990). Accordingly the nominated undertaker or any contractors will be required to implement certain control measures in relation to archaeology before construction work begins.

Schedules 9, 10 and 15 of the Crossrail Bill (2005) concern matters relating to archaeology and the built heritage and allows the dis-application by Cross Rail of various planning and legislative provisions including those related to listed building status, conservation areas and scheduled ancient monuments (Schedule 9). Schedule 10 allows certain rights of entry to English Heritage given that Schedule 9 effectively dis-applied their existing rights to the Cross Rail project, and Schedule 15 allows Cross Rail to bypass any ecclesiastical or other existing legislation relating to burial grounds.

Notwithstanding these dis-applications, it is intended that agreements setting out the detail of the works and requiring relevant consultations and approvals of detail and of mitigation arrangements will be entered into by the nominated undertaker with the relevant local planning authorities and English Heritage in relation to listed buildings and with the Department of Culture, Media and Sport (DCMS) and English Heritage in relation to Scheduled Ancient Monuments (SAMs).

3 Origin and scope of the report

This report has been commissioned from Museum of London Archaeology (MOLA) by Crossrail Ltd. The report has been prepared within the terms of the relevant standard specified by the Institute for Archaeologists (IFA, 2001). It considers the significance of the fieldwork results (in local, regional or national terms) and makes appropriate recommendations for any further action, commensurate with the results.

This report will be made available from The London Archaeological Archive and Research Centre (LAARC) in due course.

4 Previous work relevant to the archaeology of the site

The primary previous Crossrail studies are as follows:

- A Crossrail **Geoarcheological Survey:** Crossrail, MDC4 Archaeology — *Geoarchaeological Deposit Model: North Woolwich Portal*, January 2008 (Crossrail 2008a).
- A Crossrail **Generic WSI** *Archaeology Generic Written Scheme of Investigation* Doc No. CR-PN-LWS-EN-SY-00009, 2009.
- A Crossrail **Ground Investigation**: Crossrail (MOLA), *C156 – Central Project, Archaeological Monitoring of Ground Investigations, Borehole Package 19,* Document Number: C156-CSY-T1-RGNCR146_PT004-00004. May 2010, (Crossrail 2010a).
- A Crossrail Geoarchaeological Evaluation: Crossrail (MOLA), *Central Project, North Woolwich Portal & Plumstead Portal, Scope of Geoarchaeological Evaluations,* Document Number: C156-CSY-T1-RSW-CR146_PT004-00001, Rev. 2, (Crossrail 2010b).
- A Crossrail **Site-specific Written Scheme of Investigation** (SS-WSI): *C156 – North Woolwich Portal Site-Specific Archaeological Written Scheme of Investigation* Doc. No C156-CSY-T-RGN-CR146_PT004-00019, Version 8.0, 10/01/11.
- An **Archaeological Method Statement**: MOLA, C263 ARCHAEOLOGY LATE EAST Method Statement Watching Briefs, Non Listed Building recording and Geoarchaeological Borehole Survey Victoria Dock Portal and North Woolwich Portal Doc. No: C263-MLA-X-RGN-CRG07-50003, Version 3.1, 12/07/11

5 Geology and topography of site

The geological and topographical setting for North Woolwich Portal was covered in detail in the SS-WSI – *C156 North Woolwich Portal Site-Specific Archaeological Written Scheme of Investigation,* Crossrail, January 2008*,* Document No C156-CSY-T-RGN-CR146_PT004-00019, Version 8.0. This information is summarised below (see also Fig 4).

The site lies within the Holocene alluvial floodplain of the Thames. The Tertiary London Clay deposits are overlain by Pleistocene sands and gravels deposited during the closing stages of the last glacial episode between 18,000 to10, 000 years ago. During this time the Thames existed as a wide extensive braidplain, consisting of elevated gravel bars separated by multiple low lying channel threads. As the climate ameliorated at the beginning of the Holocene, *c* 10 000 years ago, the river system contracted to the lower lying channel threads, leaving the surface of the elevated gravel bars as dry land. This gravel surface topography created the 'Early Holocene' template that influenced later sedimentation and areas of dryland occupation from the Mesolithic onwards.

From the Late Mesolithic/Early Neolithic channel capacity exceed the discharge rate, resulting in many former channel threads of the braided river becoming abandoned and infilling with peat and organic sediment. An overall increase in river levels, due to ponding back and relative sea level rise further down the estuary, caused the waterlogging of previously dry terrestrial land surfaces across the elevated gravel surface topography. The impeded drainage gave rise to the extensive peat beds present within the Thames alluvial floodplain. The peats formed within semi terrestrial alder carr floodplain woodland, and formed an important resource to the prehistoric populations.

From the Early Iron Age, the increase in river levels outstripped the rate of peat formation. The alder carr woodlands were inundated by intertidal muds and salt marsh environments, which is represented in the depositional record by a transition from peats and organic deposits to minerogenic silts and clays. This tidal inundation continued into the medieval period, gradually raising and levelling off the surface of the floodplain. The raised surface of the floodplain in conjunction with the construction of drainage ditches and bankside revetments protected the floodplain from regular tidal inundation. The intertidal environments consequently transformed from salt marsh and mud flats to floodplain accretionary soils.

Geoarchaeological deposit models were undertaken for the site to characterise the gravel topography and the overlying floodplain sequences. The models identified a number of landscape zones (LZs) representative of different depositional sequences, landforms and possible chronology. These are summarised below:

- LZ1 defines low lying areas of gravel topography overlain by channel sediments of a possible Mesolithic date. Within this zone the gravel surface occurs at c.94 to 96m ATD. By the Neolithic extensive wetland peats began to accumulate within these former channel threads.
- LZ2 defines areas of raised gravel topography with a surface elevation of c 96 to 98m ATD. These areas created islands within the floodplain landscape that

probably remained as dry terrestrial ground into the Early Neolithic. One such island is centred on the western end of Factory Road, with another lying across the junction of Fernhill Street with Factory Road.

- LZ3 forms areas of transitional marshland between the high ground of LZ1 and low lying channel areas of LZ2.

The surface of the modern made ground lies at 101.50 to 102.50m ATD, rising to 105m ATD on the southern periphery of the site. The alluvial sequence measures up to 5m in thickness.

5.1 Archaeological and Historical Background

The archaeological potential of the North Woolwich Portal site was covered in detail in the SS-WSI – *C156 North Woolwich Portal Site-Specific Archaeological Written Scheme of Investigation,* Crossrail, January 2008*,* Document No C156-CSY-T-RGN-CR146_PT004-00019, Version 8.0.

During the Mesolithic period the elevated gravel islands of LZ2 would have provided suitable locations to establish makeshift camps and carry out a range of subsistence activities. By the Neolithic, the increase in river levels caused waterlogging of previously dry terrestrial surfaces, leading to wide spread peat formation into the Bronze Age period.

The peat and alluvial deposits will preserve a wide range of proxy palaeoenvironmental indicators including plant macro fossils, pollen and molluscs. The peat deposits may also preserve evidence of trackways and other timber structures constructed to traverse and exploit the rich wetland resources. By the Iron Age, the increase in relative sea level caused a switch to estuarine conditions, resulting in a transition from peat formation to the accumulation of minerogenic sediments within tidal mudflat and saltmarsh conditions.

During the Roman period a regression event caused the lowering of the river levels. As a consequence stable terrestrial soil developed within the alluvium, and evidence from past investigations in the area suggests the landscape was dry enough for occupation and activity. A possible Roman road has been suggested to run north south across the area, linking the higher ground of the north down towards the ferry crossing at north Woolwich.

A transgression event in the medieval period once again caused the landscape to revert to salt marsh and intertidal mudflats, although some areas were still habitable. The Sites and Monuments record notes the existence of the medieval settlement of North Woolwich immediately to the west of North Woolwich station. The settlement is mentioned in documentary sources from 1086, but flooding destroyed the settlement probably during the 14th and 15th centuries. The medieval manor of Hammarsh is also thought to be located approximately 0.5km to the east of the site.

By the Post-Medieval period the construction of drainage ditches and dykes reclaimed much of the marsh land. This process of land reclamation continued until the 19th century until industrialisation significantly changed the character of the area. The construction of the North Woolwich Railway, along with associated warehouses and other buildings urbanised this formerly open landscape.

A significant feature of this modem landscape was a channel known as Ham Creek, illustrated on late 19th century OS maps. This mapping indicates that the channel lies within the western 40m of the portal footprint, oriented approximately along the line of Tate Road.

6 Research objectives and aims

6.1 Objectives of the fieldwork

The overall objectives of the various watching briefs were to preserve by record any surviving archaeological and/or palaeoenvironmental remains that would be impacted upon by the enabling works.

Specifically, the archaeological investigations had the potential to recover:

- Peat and alluvial deposits preserving a wide range of proxy palaeoenvironmental indicators (i.e. pollen, diatoms, plant macro fossils) that can be utilised to reconstruct past landscape, palaeoecology, hydrology, geomorphology and past landforms.
- Prehistoric structural timber remains such as trackways, fish traps and revetments possibly occurring within the thick peat deposits
- Mesolithic to Neolithic dryland activity horizons above gravel high points, consisting of ephemeral scatters of animal bone and lithic material.
- Prehistoric negative features such as pits and postholes cutting through the Pleistocene floodplain gravels and overlying terrestrial palaeosols.
- Evidence of floodplain stabilisation and soil formation of a Roman to Medieval date within the upper minerogenic alluvium, and associated archaeology consisting of pits, ditches etc.
- Post-medieval structural remains and features associated with the industrial heritage of the area, with particular reference to features associated with the docks and the former North Woolwich Railway. Such material may be encountered within the made ground.

6.2 Research Aims

The original aims and objectives were listed in the North Woolwich Portal WSI (Crossrail 2011). The following specific research aims for the works at North Woolwich Portal were identified:

- What is the development of the local landscape, topography and environment of the Thames floodplain from prehistory to the medieval period? Are peat deposits present? If so, at what level(s) and at what date did they form? Is there evidence for stream channels, lakes, etc in the flood plain gravel surface?
- Can alluvial deposits in the western *c* 40m of the portal be related to the tributary of the Thames known as Ham Creek? If so, what can be learned about the processes by which the channel became infilled?
- Is there any evidence for prehistoric activity? If prehistoric remains are present, what is there character and what can be learned about the exploitation of the floodplain by prehistoric groups? In particular, is there any evidence for Mesolithic activity in at the base of the alluvium/surface of the gravel, or for occupation in the

areas of higher ground, such as the eastern end of the portal? Is there evidence for timber structures, such as platforms or causeways?

- What can be learned about the processes of Roman and later land reclamation, land management and flood defence?

Relevant regional research aims

The site had potential to address several general research aims identified in the regional research agenda: 'A Research Framework for London Archaeology' — Museum of London, 2002. The specific regional research themes are outlined below (page numbers are in brackets):

- understanding the significance of geomorphology, ecology, ecosystems and climate, hydrology, and vegetation and faunal development, on human lives (79);
- understanding London's hydrology, river systems and tributaries particularly the role of the Thames (as boundary, communication route, resource, ritual focus etc) in shaping London's history, and the relationships between rivers and floodplains (79);
- understanding the relationship between landscape, river and settlement, and the influences of the Thames in particular on communications and social interaction (79);
- understanding the origins of the prehistoric metalwork sequence from the Thames, and examining the links between the metalwork hoards deposited at the headwaters of river tributaries and other activities (79);
- understanding the relationship between the Bronze Age wooden trackways and the settlements to which they presumably led, and what the trackways represent in terms of woodcraft and woodland management (81);
- understanding the reasons for evolution of the road systems, street layouts, river crossings and ferries, and their importance as engines of development and change (82); and
- understanding the development of London's Docklands and Waterways (82).

7 Methodology of site-based and off-site work

All archaeological excavation and recording during the evaluation was carried out in accordance with:

- A Crossrail **Generic WSI** Doc. No: 14022008-44ES-P2Z1.
- **Site-specific Written Scheme of Investigation** (SS-WSI): *C156 North Woolwich Portal Site-Specific Archaeological Written Scheme of Investigation* Doc. No C156-CSY-T-RGN-CR146_PT004-00019, Version 8.0, 10/01/11.
- An **Archaeological Method Statement**: MOLA, *C263 ARCHAEOLOGY LATE EAST Method Statement Watching Briefs, Non Listed Building recording and Geoarchaeological Borehole Survey Victoria Dock Portal and North Woolwich Portal* Doc. No: C263-MLA-X-RGN-CRG07-50003, Version 3.1, 12/07/11.
- Museum of London *Archaeological Site Manual* (MoL 1994)
- Corporation of London Department of Planning and Transportation, 2004 Planning Advice Note 3: Archaeology in the City of London, Archaeology Guidance

The site finds and records can be found under the site code XSV11 in the MOLA archive. They will be stored there pending a future decision over the longer-term archive deposition and public access process for the wider Crossrail scheme.

7.1 General watching Brief methodology

A General Watching Brief consisted of a basic monitoring presence to observe the works carried out either by the Principal Contractor or their sub-contractor without constraint on their working methods (Crossrail 2009 Archaeology Specification for Evaluation & Mitigation (including Watching Brief) CR-PN-LWS-EN-SP-0001, version 3). This included making a basic record of notes, measurements, drawings and photographs consistent with an observation role; e.g. depth, character, date and survival/truncation of deposit sequence, height of natural geology. Monitoring and recording during the general watching brief was generally made by observation from ground level. During a general watching brief MOLA staff will only enter the trench or area of excavation by agreement with the Principal Contractor or their sub-contractor (providing that there is proper access and that it is safe to do).

The watching brief required recording of natural floodplain deposits. Where possible, profiles through the alluvium were examined in section. . If trench sections were not visible, the alluvial deposits were recorded by examining spoil brought up from the excavation by machine bucket. Depths of the sequences were recorded by measuring down from the side of the excavation where safe to do so.

Generally monitoring was undertaken when areas or trenches have been dug down to the level of potential archaeological interest. For this reason, a flexible approach was taken and kept under review. The monitoring presence alternated between full and part-time depending upon the Principal Contractor's programme (e.g. the nature and intensity of ground works) and the archaeological results. For example, any

areas where the Principal Contractor's works prove to be of insufficient depth to affect significant archaeological deposits were scoped out of the Watching Brief. The MOLA Senior Archaeologist undertaking the monitoring made an appraisal inspection during the Principal Contractor's initial breaking out, removal of overburden etc. in order to determine at what depth the relevant deposits (if present) occurred.

The MOLA monitoring archaeologist maintained regular contact with a nominated member of the Principal Contractor's team on site regarding the overall work programme and progress, including any changes to the proposed depths of excavation. The frequency of visits was adjusted as necessary as work progressed to take into account areas where it can be shown that existing disturbance had already removed archaeological deposits.

If potentially significant (but localised) remains had been exposed, such that they could not be recorded adequately under basic monitoring, then the status of the fieldwork event would have been reviewed by the Project Archaeologist and could have been redefined as a Targeted Watching Brief. This redefinition, if authorised by the Project Archaeologist, would have permitted additional resources in terms of staff and attendance to allow for more intensive recording.

Within the North Woolwich Portal site the majority of the C233 works involved the diversion of the existing services into a multi utility trench. The existing services currently run along Albert Road and Factory road. The roads are separated by; and run parallel to the former North London railway line. The diversions which required a watching brief attendance are outlined below:

- diversion of the 125mm and 250mm water main on Albert Road; open cut trench to a depth of *c* 1.0–1.5m
- diversion of the 1220mm sewer on Albert Road, with the construction of associated manholes; open cut trench to a depth of *c* 3.0–4.0m
- diversion of 355mm gas main on Albert Road; open cut trench to a depth of *c* 1.0–2.0m
- diversion of telecoms and electrics (i.e. EDF, ICT and CCTV) on Albert Road; open cut trench *c* 1.0m deep
- diversion of 250mm and 560mm water mains on Factory Road; open cut trench to a depth of *c* 1.0–1.5m
- diversion of 225mm sewer on Factory Road; open cut trench to a depth of c 3.0–4.0m
- diversion of telecoms and electrics (i.e. BT, Virgin, EDF and Interoute) on Factory road; open cut trench to a depth of *c* 1.0m
- diversion of 150mm gas main on Factory Road; open cut trench to a depth of *c* 1.0–2.0m

Previous geotechnical investigations had indicated that the modern overburden was in the order of 0.5–1.6m in thickness. Therefore all the excavations for the utility diversions were likely to impact on the alluvial floodplain sequence. Excavations of 1.0–1.5m depth were only likely to impact on the upper minerogenic alluvial deposits.

These upper alluvial deposits may contain archaeological material of a Late Iron Age to Medieval date. The deeper excavations, which extend to *c* 4m below ground level, may have impacted on the Bronze Age peat deposits. These peats were thought likely to have high palaeoenvironmental potential, and possibly had preserved timber structures such as trackways.

8 Results and observations

The locations of the watching brief trenches and chambers are shown on figure 1.

8.1 Albert Road

Sewer (1220mm) Diversion Trench	
Location	East to west along the north side of Albert Road. One section excavated at west end by the health centre. The trench to the eastern end is located from Henleys to St. Johns church
Dimensions	2.5m wide (N-S) x c.105.0m (East end) and c.60.0m (West end) x 4.5m deep.
London Survey grid coordinates	West trench 92896 34482 East trench 92954 34469
OS National grid coordinates	West end trench – 542588 180038 to 542647 180026 East end trench – 542866 179980 to 542870 179959
Modern Ground Level (adjacent to trench)	The ground rises from east to west along Albert Road. Modern ground level is circa 102.5m ATD
Modern subsurface deposits	Tarmac over concrete measures 0.10m bgl. Subsurface modern overburden measures 0.10m – 0.60m bgl.
Level of base of archaeological/geoarchaeological deposits observed and/or base of trench	98.0m ATD
Natural geology observed (truncated/not truncated ?)	Not reached
Extent of modern truncation	Up to 1.9m bgl on the south side due to existing sewer. Up to 1.0m on the north side due to redundant cast iron water pipe.
Archaeological remains	**Dating Evidence, Finds, and Samples**
Blue-grey minerogenic alluvial clay [1] Variable between 1.00m - 1.60m and 4.50m	No finds
Brown-grey minerogenic alluvial clay [2] Variable between 2.60m - 3.00m	Preserved elm and ash timber
Mid-brown organic peat deposit [3]	Preserved elm and ash timber

Variable between 2.10m – 2.60m and 3.00 - 3.50m	
Trench interpretation and summary	
No archaeological remains were found. The timber was of non-archaeological significance.	

Photo 1 Sewer Diversion, working shot showing modern overburden and granite setts overlying blue-grey minerogenic alluvial clay[1] on the south facing section to 2.10m bgl, looking south-west.

Photo 2 Sewer Diversion showing north profile to 4.5m bgl with modern overburden overlying blue-grey minerogenic alluvial clay [1], looking north.

Photo 3 Sewer Diversion, working shot of trench excavation showing mid-brown organic peat deposit between 2.3-3.2m bgl, looking north-east.

ARE1 Connection Chamber	
Location	In front of the Royal Dock Activity and Learning Centre across Albert Road, 0.50m from the south pavement and 0.15m from the north pavement at Albert Road.
Dimensions	6.0m wide (N-S) x 7.0m long (E-W). The south side of the chamber was excavated to a depth of x 2.3m bgl. A test pit was excavated to 2.6m bgl in the south-west corner of the trench and immediately backfilled. Depth is 4.5m bgl at the north side of the chamber as it incorporates the 1220mm sewer diversion trench.
London Survey grid coordinates	Centre 93276 34391
OS National grid coordinates	Centre 542971 179957 North west corner – 542965 179961
Modern Ground Level (adjacent to pit)	101.44m ATD
Modern subsurface deposits	Tarmac over concrete measures 0.10m bgl. Subsurface modern overburden measures 0.10m – 1.0m bgl.
Level of base of archaeological/geoarchaeological deposits observed and/or base of trench	Base of trench at north side was 96.44m ATD. Base of trench at south side was 99.14m ATD.
Natural geology observed (truncated/not truncated ?)	Not reached
Extent of modern truncation	1.0m bgl on the north side. 2.0m on the south side due to gas and water services.
Archaeological remains	**Dating Evidence, Finds, and Samples**
Blue-grey minerogenic alluvial clay [1] Redeposited between 1.00 – 2.00m	No finds
Mid-brown organic peat deposit [3] Between 2.00m – 2.60m	No finds
Trench interpretation and summary	
No archaeological remains were found. Modern overburden to 1.0m bgl with a mix of overburden with redeposited blue-gry minerogenic alluvial clay to 2.0m bgl. Horizon between truncated material and mid-brown organic peat deposit occurs between 2.0m-2.30m bgl.	

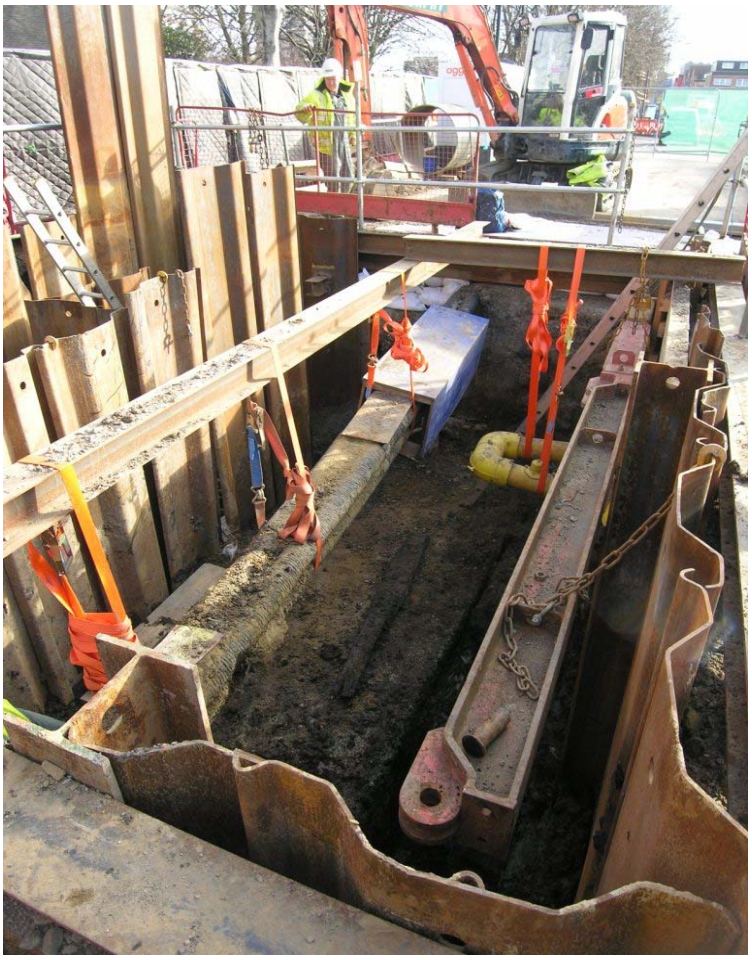

Photo 4 ARE1 Chamber, south side excavated to 2.3m bgl showing upper horizon of mid-brown organic peat deposit [3] underlying modern overburden, looking north-east.

ARE 3&4 Connection Chamber	
Location	At the junction of Albert Road with Fernhill Street in front of the Henley Arms Public House
Dimensions	13.10m max (E-W) long x 7.80m max (N-S) x 2.55m deep. Irregular in plan.
London Survey grid coordinates	Centre 93172 34417
OS National grid coordinates	Centre 542865 179980 North 542864 179984 South 542862 179977
Modern Ground Level (adjacent to chamber)	101.84m ATD
Modern subsurface deposits	Tarmac over concrete measures 0.10m bgl. Subsurface modern overburden measures

	0.10m –1.6m bgl.
Level of base of archaeological/geoarchaeological deposits observed and/or base of trench	99.29m ATD
Natural geology observed (truncated/not truncated ?)	Not reached
Extent of modern truncation	Truncated to the top of existing sewer at 2.55m bgl.
Archaeological remains	**Dating Evidence, Finds, and Samples**
None	None
Trench interpretation and summary	
No archaeological remains were found. The chamber incorporates the 1220mm Sewer Diversion by Henley Arms Public House in the north-east corner. It extends 1.95m north of Albert Road onto Fernhill Street at the western side of Fernhill Street. The chamber was heavily truncated with new and existing utility services thus modern made ground (brown silt) to 1.6m bgl and redeposited blue-grey minerogenic alluvial clay [1], from 1.6m to 2.55m bgl, was only observed during the excavations.	

Photo 5 ARE 3 and 4 showing the overall chamber with modern made ground mixed with redeposited blue-grey minerogenic alluvial clay. The 1220mm Sewer diversion trench joins the chamber in the north-east corner, looking north-east.

ARW5 Connection Chamber	
Location	Located 39.30m east of Tate Road on the north-side of Albert Road.
Dimensions	7.0m long (N-S) x 4.0m wide (E-W) x depth of circa 4.7m.
London Survey grid coordinates	Centre 92853 34487
OS National grid coordinates	Centre 54254 180042 North west corner 542544 180046
Modern Ground Level (adjacent to chamber)	102.20m ATD
Modern subsurface deposits	Tarmac over concrete measures 0.10m bgl. Subsurface modern overburden measures 0.10m –1.00m bgl.
Level of base of archaeological/geoarchaeological deposits observed and/or base of trench	97.5m ATD
Natural geology observed (truncated/not truncated ?)	Not reached
Extent of modern truncation	Circa 2.5m bgl to the top of the existing brick culvert. Height of culvert is circa 1.5m. Truncation to 4.0m bgl. An eleptical pipe is located to the south
Archaeological remains	**Dating Evidence, Finds, and Samples**
Blue-grey minerogenic alluvial clay [1]. Redeposited between 1.00m and 4.00m. Sterile blue-grey minerogenic alluvial clay excavated between 4.00m – 4.70m.	No finds
Trench interpretation and summary	
No archaeological remains were found. Chamber was truncated by existing utilities.	

Photo 6 ARW5 Chamber showing excavation of redeposited blue-grey minerogenic alluvial clay [1] to 1.2m bgl. Gas and water utilities to the north. Looking west.

Photo 7 ARW5 Chamber showing excavation of blue-grey minerogenic alluvial clay[1] to the south of the existing brick culvert between 4.00-4.70m bgl, looking south-west.

Water Main (125mm) Diversion Trench	
Location	125mm located along the south side of Albert Road.
Dimensions	0.5m wide x c.456.0m x c.1.5m deep.
London Survey grid coordinates	West end 92845 34489 East end 93290 34388
OS National grid coordinates	West end – 542537 180043 East end – 542985 179953
Modern Ground Level (adjacent to pit)	101.5m ATD
Modern subsurface deposits	Tarmac over concrete measures 0.10m bgl. Subsurface modern overburden measures 0.10m – 0.80m bgl.
Level of base of archaeological/geoarchaeological deposits observed and/or base of trench	100.0m ATD
Natural geology observed (truncated/not truncated ?)	Not reached
Extent of modern truncation	To 1.5m bgl
Archaeological remains	**Dating Evidence, Finds, and Samples**
None	No finds
Trench interpretation and summary	
No archaeological remains were found. Upper made ground only exposed.	

Photo 8 125mm Water Diversion on Albert Road looking south showing modern made ground to 1.5m bgl, looking south.

Gas Main (355 mm) and Water (250mm)Diversion Trench	
Location	250mm water and 355mm gas located within the kerb line and along the north side of the pavement on Albert Road. Two road crossings located on Albert Road, one at Kennard Street junction and one opposite St. John's Church.
Dimensions	Water and gas trench - c.1.0m wide x c. 261.0m x c.1.0 – 1.5m deep
London Survey grid coordinates	West end 93000 34460 East end 93254 34400
OS National grid coordinates	West end – 542693 180019 East end – 542948 179965
Modern Ground Level (adjacent to pit)	101.5m ATD
Modern subsurface deposits	Tarmac over concrete measures 0.10m bgl. Subsurface modern overburden measures 0.10m – 0.40m bgl.
Level of base of archaeological/geoarchaeological deposits observed and/or base of trench	100.0m ATD
Natural geology observed (truncated/not truncated ?)	Not reached

Extent of modern truncation	To 0.40m bgl.
Archaeological remains	**Dating Evidence, Finds, and Samples**
Blue-grey minerogenic alluvial clay [1]. Between 0.40m – 1.5m bgl.	No finds
Trench interpretation and summary	
No archaeological remains were found. The 250mm water and the 355mm gas utility was installed in some sections along Albert Road within the 1220mm Sewer diversion. See photos 5 and 6 above for 250mm water along Albert Road. See photo 5 and 6 above for 250mm water and gas along Albert Road.	

Photo 9 Gas and Water diversion trench showing modern overburden overlying a grey-blue minerogenic alluvial clay [1] appearing at 1.40m bgl, looking north.

Telecoms and Electrics (EDF/ICT/CCTV) Diversion Trench	
Location	Along north side of Albert Road east of Tate Road and east of Fernhill Street. Trenches excavated at the eastern and western ends of Albert Road.
Dimensions	c.82.0m (east end) and c. 153.0m (west end) long x c.1.0m wide x c.1.0m deep
London Survey grid coordinates	West trench 92815 34498 to 92965 34468 East trench 93190 34415 to 93269 34396
OS National grid coordinates	West trench 542507 180051 to 542657 180026 East trench 542883 179978 to 542964 179961
Modern Ground Level (adjacent to pit)	101.50m ATD
Modern subsurface deposits	Tarmac over concrete measures 0.10m bgl. Subsurface modern overburden measures 0.10m – 0.40m bgl.
Level of base of archaeological/geoarchaeological deposits observed and/or base of trench	100.50m ATD
Natural geology observed (truncated/not truncated ?)	Not reached
Extent of modern truncation	
Archaeological remains	**Dating Evidence, Finds, and Samples**
None	No finds
Trench interpretation and summary	
No archaeological remains were found. Only modern made ground was observed.	

8.2 Factory Road

Sewer (225mm) Diversion Trench	
Location	Western end of Factory Road from delivery entrance to the Tate and Lyle Sugar Factory running east terminating east of Alandale House before Loon Fung Store. Trench located on the south side c. 2.50-3.00m from the south pavement. Also at the eastern end by the industrial estate.
Dimensions	171.0 m (west trench) and 152.0m (east trench) long x c.1.80m wide x 4.5m deep max.
London Survey grid coordinates	West trench 92850 34467 to 93017 34429 East trench 93125 34403 to 93274 34368
OS National grid coordinates	West trench 542543 180021 to 542711 179987 East trench 542819 179965 to 542969 179933
Modern Ground Level (adjacent to pit)	102.5m ATD
Modern subsurface deposits	Tarmac over concrete measures 0.10m bgl. Subsurface modern overburden measures 0.10m – 0.50m bgl.
Level of base of archaeological/geoarchaeological deposits observed and/or base of trench	99.00m ATD
Natural geology observed (truncated/not truncated ?)	Not reached
Extent of modern truncation	Most of the trench was truncated to 2.0m with shallow utilities. The deeper utilities truncated the trench up to 3.0m bgl.
Archaeological remains	**Dating Evidence, Finds, and Samples**
Blue-grey minerogenic alluvial clay [1] Between 1.70-2.00m – 4.50m bgl.	No finds
Trench interpretation and summary	
No archaeological remains were found. A series of deposits was observed beneath the tarmac overlying the distinct blue-grey minerogenic alluvial clay [1] on the north facing profile only for a c.26m long section between the Tate and Lyle Sugar Factory and Alandale House. The horizontal sequence comprises up to nine deposits in the form of a mixed black grey silty sand layer (1.10m thick) overlying a reddish brown silt (0.10m) lying on burnt debris in the form of a 0.5m thick black silt deposit with occasional red brick fragments. This was deposited on a sequence of silt and clay deposits, varying between 0.05-0.10m thick, separated by a 0.15m thick deposit of white chalk. These mixed deposits	

appear to represent redeposited demolished rubble construction material and burnt material as utilities were observed within and underlying these deposits (see Photo 10). Originally they would have formed the foundation for the railway line. Redeposited blue-grey minerogenic alluvial clay was also observed around the deeper utility installations which truncated the trench to c. 3.0m bgl.

Photo 10 Working shot of excavation of sewer diversion trench showing utility running north to south with overlying redeposited material, looking south.

Photo 11 Working shot of sewer diversion showing excavation of [1] to depth of 4.5m bgl, looking east.

FRW 1 Connection Trench	
Location	Located adjacent to the northern kerb at Albert road, 2.70m west of the east corner of the delivery entrance to Tate and Lyle Sugar Factory and 3.20m north.
Dimensions	9.80m (E-W) x 3.20m (N-S) x 2.70m deep
London Survey grid coordinates	Centre 92816 34476
OS National grid coordinates	Centre 542509 180029
Modern Ground Level (adjacent to trench)	102.33 ATD
Modern subsurface deposits	Tarmac over concrete measures 0.15m bgl. Subsurface modern overburden measures 0.10m – 2.70m bgl.
Level of base of archaeological/geoarchaeological deposits observed and/or base of trench	99.63m ATD
Natural geology observed (truncated/not truncated ?)	Not reached
Extent of modern truncation	To 2.70m bgl
Archaeological remains	**Dating Evidence, Finds, and Samples**
None	No finds
Trench interpretation and summary	
No archaeological remains were found. The subsurface overburden comprised of mid brown silty clay mixed with blue-grey minerogenic alluvial clay. A manhole, viewed as a concrete cylinder was present in the south-west corner of the trench. A utility pipe runs east to west across the trench, 0.90m bgl.	

Photo 12 FRW1 showing modern made ground and utility pipe running east to west across trench, looking west.

FRW2 Connection Trench	
Location	Located in front of the 'Works' building immediately east of the Tate and Lyle Sugar Factory. The trench was located 2.35m north of the south pavement on Factory Road.
Dimensions	4.70m long (E-W) x 3.20m wide (N-S) x 2.5m deep
London Survey grid coordinates	Centre 92844 34469
OS National grid coordinates	Centre 542537 180023
Modern Ground Level (adjacent to pit)	102.46m ATD
Modern subsurface deposits	Tarmac over concrete measures 0.10m bgl. Subsurface modern overburden measures 0.10m – 2.50m bgl.
Level of base of archaeological/geoarchaeological deposits observed and/or base of	99.96m ATD

trench	
Natural geology observed (truncated/not truncated ?)	Not reached
Extent of modern truncation	Up to 2.20m bgl
Archaeological remains	**Dating Evidence, Finds, and Samples**
Blue-grey minerogenic alluvial clay [1] Between 2.20m-2.50m bgl	No finds
Trench interpretation and summary	
No archaeological remains were found. Modern overburden comprised sand and redeposited mixed grey-blue minerogenic alluvial clay over a sewer connection in the centre of the chamber. The utility pipe overlies a blue-grey minerogenic alluvial clay [1].	

Photo 13 FRW2 showing utility overlying blue-grey minerogenic alluvial clay [1], looking north.

Middle Connection Trench between FRW 1 and FRW2	
Location	Located adjacent to FRW 2, in front of the 'Works' building immediately east of the Tate and Lyle Sugar Factory.
Dimensions	3.40m wide (E-W) x 3.55m long(N-S) x 2.60m deep
London Survey grid coordinates	Centre 92840 34469

OS National grid coordinates	Centre 542533 180024
Modern Ground Level (adjacent to pit)	102.46m ATD
Modern subsurface deposits	Tarmac over concrete measures 0.10m bgl. Subsurface modern overburden measures 0.10m – 2.40m bgl.
Level of base of archaeological/geoarchaeological deposits observed and/or base of trench	102.46m ATD
Natural geology observed (truncated/not truncated ?)	Not reached
Extent of modern truncation	Up to 2.4m bgl
Archaeological remains	**Dating Evidence, Finds, and Samples**
Blue-grey minerogenic alluvial clay [1] Between 2.40m-2.60m bgl.	No finds
Trench interpretation and summary	
No archaeological remains were found. A utility pipe was located on the northern side of the trench which was encased in concrete. A concrete manhole was located to the immediate west of the trench. Redeposited blue-grey minerogenic alluvial clay mixed with overburden was present to 2.40m bgl. This overlay blue-grey minerogenic alluvial clay [1].	

Photo 14 Connection chamber between FRW1 and FRW2, showing concrete to the north and west, looking north.

Elliptical Sewer Connection Chamber Factory Road	
Location	Located on the north side of Factory Road, 3.90m west of the 225m sewer, opposite ARW5 on Albert Road
Dimensions	3.10m (E-W) x 2.90m (N-S) x 5.00m deep
London Survey grid coordinates	Centre 92845 34471
OS National grid coordinates	Centre 542538 180025
Modern Ground Level (adjacent to pit)	102.46m ATD
Modern subsurface deposits	Tarmac over concrete measures 0.10m bgl. Subsurface modern overburden measures 0.10m – c.1.80m bgl.
Level of base of archaeological/geoarchaeological deposits observed and/or base of trench	102.46m ATD
Natural geology observed (truncated/not truncated ?)	Not reached
Extent of modern truncation	Up to c.1.80m
Archaeological remains	**Dating Evidence, Finds, and Samples**
Blue-grey minerogenic alluvial clay [1] Between c.1.80m-5.00m bgl	No finds
Trench interpretation and summary	
No archaeological remains were found. This trench was dug by hand to a depth of 5.00m and facilitated the joining of the elliptical sewer from Factory Road to the elliptical sewer in ARW5 at Albert Road.	

Photo 15 Elliptical Sewer connection chamber on Factory Road, looking south.

Sewer Connection Chamber between FRW 2 and FRW 1	
Location	Located on the north side of Factory Road to the west of the delivery entrance to Tate and Lyle Sugar Factory. Situated 2.60m from the kerb of the southern pavement.
Dimensions	4.20m (E-W) x 4.10m (N-S) x 4.0 m deep
London Survey grid coordinates	Centre 92827 34471
OS National grid coordinates	Centre 542520 180025
Modern Ground Level (adjacent to pit)	102.46m ATD
Modern subsurface deposits	Tarmac over concrete measures 0.10m bgl. Subsurface modern overburden measures 0.10m – c3.5m bgl.
Level of base of archaeological/geoarchaeological deposits observed and/or base of trench	98.46m ATD
Natural geology observed (truncated/not truncated ?)	Not reached
Extent of modern truncation	Up to 4.0m
Archaeological remains	**Dating Evidence, Finds, and Samples**
Blue-grey minerogenic alluvial clay [1] Around 3.5m	No finds
Trench interpretation and summary	
No archaeological remains were found. Modern overburden and redeposited mixed grey-	

blue minerogenic alluvial clay over sewer pipes in the centre of the chamber. Overlying blue-grey minerogenic alluvial clay [1].

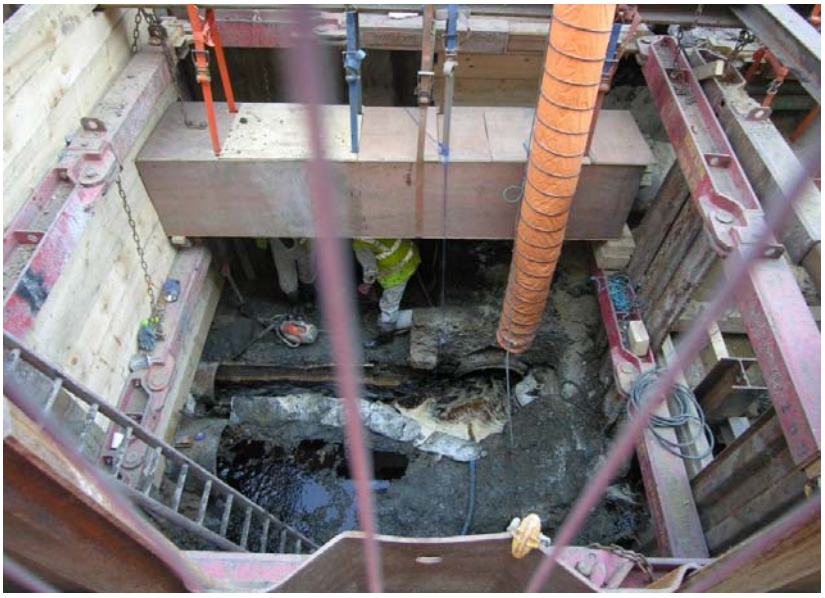

Photo 16 Sewer chamber at circa 3.5m bgl showing open sewers laid into blue-grey minerogenic alluvial clay [1], looking north.

Photo 17 250mm water diversion showing brown-grey minerogenic alluvial clay [2] underlying modern overburden, looking south-west.

Water (250mm) Diversion Trench	
Location	Along the south side of Factory road, 1.5m north of the southern pavement.
Dimensions	c. 459.0m long (E-W) x c. 0.80m wide x 1.5m deep
London Survey grid coordinates	West 92823 34472 East 93271 34369
OS National grid coordinates	West 542516 180026 East 542966 179934
Modern Ground Level (adjacent to trench)	101.5m ATD at eastern end of factory road 102.5m ATD at western end of factory road
Modern subsurface deposits	Tarmac over concrete measures 0.10m bgl. Subsurface modern overburden measures 0.10m – 0.50m bgl.
Level of base of archaeological/geoarchaeological deposits observed and/or base of trench	Not reached
Natural geology observed (truncated/not truncated ?)	Not reached
Extent of modern truncation	Up to 0.50m bgl
Archaeological remains	**Dating Evidence, Finds, and Samples**
Brown-grey minerogenic alluvial clay [2] Between 0.50-1.50m bgl	No finds
Trench interpretation and summary	
No archaeological remains found.	

Water (560mm) Diversion Trench	
Location	Centrally along the eastern end of Factory Road by the satellite dishes, aligns along the south from the industrial standard estate to Loon Fung whereby it aligns along the 225mm Sewer diversion.
Dimensions	c. 460.0m long (E-W) x c.1.10m wide x 2.40m (max) deep
London Survey grid coordinates	West 92821 34472 East 93269 34368
OS National grid coordinates	West 542514 180026 East 542964 179933
Modern Ground Level (adjacent to pit)	101.5m ATD at eastern end of factory road 102.5m ATD at western end of factory road
Modern subsurface deposits	Tarmac over concrete measures 0.10m bgl. Subsurface modern overburden measures 0.10m – c.1.80m bgl.
Level of base of archaeological/geoarchaeological deposits observed and/or base of trench	99.10m ATD at eastern end of factory road 100.10m ATD at western end of factory road
Natural geology observed (truncated/not truncated ?)	Not reached
Extent of modern truncation	Up to 1.80m bgl
Archaeological remains	**Dating Evidence, Finds, and Samples**
Blue-grey minerogenic alluvial clay [1] Between 0.70m and1.80m – 2.40m bgl Max depth was 1.0m	No finds
Trench interpretation and summary	
No archaeological remains found. The made ground along this trench varied from between 0.70m – 1.80m bgl. There was some contaminated ground (diesel etc) along the section of the trench in front of Humphrey's Yard related to its previous land use as a car-wreck yard. A connection chamber was excavated at the eastern end of Factory road, east of Henley Road in front of the satellite dishes, measuring c. 7.0m (e-w) x 3.30m (n-s) x 2.30m bgl. At the western end of Factory Road the water diversion follows the alignment of the 225mm sewer diversion. Here rubble construction building material and a mixed mortar and clay layer were observed within the made ground. Some sections of this water trench overlay existing water utilities. Existing utilities were observed running parallel along the north and south section faces thus the majority of the spoil consisted of modern made ground and redeposited mixed blue-grey minerogenic alluvial clay.	

Photo 18 Excavation of 560mm water diversion showing blue-grey minerogenic alluvial clay [1] at 1.80m bgl, looking west.

Gas (150mm) Diversion Trench	
Location	Located at the western end of Factory Road along the north side between Loon Fung and the Tate and Lyle sugar factory and in front of the Industrial Estate.
Dimensions	c. 166.0m long (e-w) x m wide (n-s)1.5m deep
London Survey grid coordinates	West 92825 34471 East 92987 34436
OS National grid coordinates	West 542517 180025 East 542681 179994
Modern Ground Level (adjacent to pit)	102.5m ATD at western end of factory road
Modern subsurface deposits	Tarmac over concrete measures 0.10m bgl.

	Subsurface modern overburden measures 0.10m – c.0.50m bgl.
Level of base of archaeological/geoarchaeological deposits observed and/or base of trench	101.0m ATD
Natural geology observed (truncated/not truncated ?)	Not reached
Extent of modern truncation	From 0.50-1.00m bgl
Archaeological remains	**Dating Evidence, Finds, and Samples**
Blue-grey minerogenic alluvial clay [1] Between 1.00-1.50m bgl	No finds
Trench interpretation and summary	
No archaeological remains. Numerous services were present within the diversion trench. Where services were absent a dark blue-grey minerogenic alluvial clay [1] was revealed, usually 1.00m bgl. Modern made ground often comprised a mixed dark blackish and greyish brown silty clay with occasional rubble inclusions overlying a chalk layer deposited on the blue-grey minerogenic alluvial clay [1].	

Photo 19 Gas diversion trench showing made ground overlying a blue-grey minerogenic alluvial clay [1] showing at 1.3m bgl, looking west.

Telecoms and Electrics (EDF, BT, VIRGIN, INTERROUTE) Diversion Trench	
Location	South side of factory road adjacent to the kerbing along the southern pavement.
Dimensions	c.553.0m long (BT) and c.235.0m (interroute) and c. 177.0m (EDF) x 0.90m wide (n-s) x 1.0m deep
London Survey grid coordinates	BT west 92805 34473 Interroute west 93040 34421 east 93269 34366 EDF west 92821 34470 east 92994 34431
OS National grid coordinates	BT west 542498 180026 east 543040 179914 Interroute west 542733 179980 east 542964 179931 EDF west 542514 180023 east 542688 179990
Modern Ground Level (adjacent to pit)	101.50 ATD
Modern subsurface deposits	Tarmac over concrete measures 0.10m bgl. Subsurface modern overburden measures 0.10m – c.0.70m bgl.
Level of base of archaeological/geoarchaeological deposits observed and/or base of trench	100.50m ATD
Natural geology observed (truncated/not truncated ?)	Not reached
Extent of modern truncation	From 0.70m – 1.00m bgl
Archaeological remains	**Dating Evidence, Finds, and Samples**
Brown-grey minerogenic alluvial clay [2] Between 0.50-0.70m and 1.00m bgl	No finds
Trench interpretation and summary	
No archaeological remains. Most of these diversion trenches were comprised of modern made ground. A mixed brown-grey minerogenic alluvial clay [2] was on occasion visible underlying the modern overburden.	

Photo 20 BT, Virgin, EDF and Interroute diversion trench, along the pavement edge on the south side of Factory Road, looking west.

9 Assessment of results against original research aims

The draft revised GLAAS guidelines (English Heritage, 2009) require an Assessment of results against original expectations (these no longer mention the criteria for assessing national importance).

Likewise City of London guidance (CoL 2004) sets out advice for work carried out in London, including an assessment of results against original expectations/objectives (assessment against the above criteria are only required for evaluations).

9.1 Original research aims and objectives

A number of research objectives outlined in the method statement (Crossrail 2011) were achieved. Information was recovered on:

1. *Peat and alluvial deposits preserving a wide range of proxy palaeoenvironmental indicators (i.e. pollen, diatoms, plant macro fossils) that can be utilised to reconstruct past landscape, palaeoecology, hydrology, geomorphology and past landforms.*
    - Peat and alluvial deposits were exposed along Albert Road east of Fernhill Street within the deep 1220mm Sewer Diversion trench at a depth of circa 1.00 – 4.5m bgl. This peat is located within the marginal wetlands as indicated in the geoarchaeological deposit model (Crossrail 2008). These may have preserved a wide range of proxy palaeoenvironmental indicators however, as complete profiles were not revealed, sampling was not deemed appropriate.
    - Alluvial-only deposits were exposed in both the shallow and deeper diversion trenches and chambers on both Albert and Factory road revealing the deeper channel areas (LZ1).

2. *Prehistoric structural timber remains such as trackways, fish traps and revetments possibly occurring within the thick peat deposits*
    - Pieces of timber, in the form of tree trunk stubs and driftwood, were exposed within the peat deposits on Albert road however these were non-structural and appeared to be naturally occurring timber preserved within the marginal wetland.

3. *Mesolithic to Neolithic dryland activity horizons above gravel high points, consisting of ephemeral scatters of animal bone and lithic material.*
    - No Mesolithic or Neolithic dryland activity horizons were exposed during archaeological investigations at North Woolwich.

4. *Prehistoric negative features such as pits and postholes cutting through the Pleistocene floodplain gravels and overlying terrestrial palaeosols.*

    - No Prehistoric negative features were observed cutting through the Pleistocene floodplain gravels and overlying terrestrial palaeosols.

5. *Evidence of floodplain stabilisation and soil formation of a Roman to Medieval date within the upper minerogenic alluvium, and associated archaeology consisting of pits, ditches etc.*

    - No evidence of floodplain stabilisation and soil formation of a Roman to Medieval date within the upper minerogenic alluvium and associated archaeology.

6. *Post-medieval structural remains and features associated with the industrial heritage of the area, with particular reference to features associated with the docks and the former North Woolwich Railway. Such material may be encountered within the made ground.*

    - No post-medieval structural remains and features associated with the industrial heritage of the area were exposed. At the western end of Factory road a series of levelling deposits were revealed within the made ground which appear to be associated with establishing a foundation for the construction of the North London Line which ran between Factory and Albert Road.

Specific research aims were set out for the works at North Woolwich Portal in the WSI (Crossrail 2011). These aims have been addressed during the archaeological monitoring of the works as follows:

1. *What is the development of the local landscape, topography and environment of the Thames floodplain from prehistory to the medieval period? Are peat deposits present? If so, at what level(s) and at what date did they form? Is there evidence for stream channels, lakes, etc in the flood plain gravel surface?*

    - The local landscape and environment to the north of the Thames at North Woolwich portal appears to a represent a long history of active and cut-off braided channels networking through low elevation marshland within this area. The sediments observed along Albert road indicated the presence of more cut-off braided channels in times when the climate was drier whilst the channels flowing along what is now Factory Road appeared to have been deeper and remained active but slow flowing, which accounts for the predominantly fine-grained minerogenic sub-surface deposits.
    - The sub-surface deposits observed at the eastern end of Albert Road indicate intermittent wet and dry zones. There would have been more

slow moving and cut-off channels present which were prone to sediment infilling thus allowing peat formation. The peat deposits, highly fibrous with remnants of alder-carr vegetation, indicated that moisture tolerant vegetation existed along this marginal marshland area. The peat formed above fine grained minerogenic sediments but in wetter times it is likely this area flooded, sealing the peat with a sequence of fine grained minerogenic alluvial deposits. The upper alluvial deposits were observed from 101.5m – 100.90m ATD and the lower from 99.00m – 98.00m ATD whilst the level of the peat varied from 100.40m – 99.00m ATD.

- Large sections of fine grained minerogenic alluvial deposits were observed all along Factory road indicating that this area nearest the Thames floodplain remained wet from Prehistoric times right up until the medieval period. Slower moving braided channels would have facilitated the deposition of these minerogenic alluvial deposits. The upper alluvial sequence was often mixed with modern made ground and in some cases appeared to have been redeposited throughout the later medieval period. The earlier alluvial sequence was observed from 99.00m-98.46m ATD.
- Gravels were not observed throughout the programme of works at the North Woolwich Portal indicating that the area of Factory and Albert Road do indeed represents the marginal braidedplains/floodplains associated with the River Thames.

2. *Can alluvial deposits in the western c 40m of the portal be related to the tributary of the Thames known as Ham Creek? If so, what can be learned about the processes by which the channel became infilled?*

   - Due to the intermittent nature of the diversion works and the necessity for the installation of trench sheeting from 1.2m bgl disallowing a clear visual profile of the alluvial deposits we were unable to establish if there was a relationship/association between the alluvial deposits in the western area of the portal and the tributary known as Ham Creek.

3. *Is there any evidence for prehistoric activity? If prehistoric remains are present, what is there character and what can be learned about the exploitation of the floodplain by prehistoric groups? In particular, is there any evidence for Mesolithic activity in at the base of the alluvium/surface of the gravel, or for occupation in the areas of higher ground, such as the eastern end of the portal? Is there evidence for timber structures, such as platforms or causeways?*

   - There was no evidence for prehistoric activity within the trench diversion trenches monitored.

4. *What can be learned about the processes of Roman and later land reclamation, land management and flood defence?*

   - There was no evidence for Roman and later land reclamation, land management and flood defence.

9.2 Additional research themes

No new themes have been identified from the fieldwork results.

10 Statement of potential archaeology

Although no archaeological remains were recorded during the watching brief, the undisturbed alluvial deposits and peat layers demonstrate that the potential for significant archaeological remains is still relatively high. The type of archaeological remains that might be anticipated would be difficult to observe under the watching brief conditions, although any heritage asset comprising substantial timbers or significant quantities of cultural material would have been apparent had it been present.

The deposit sequences that were observed also have palaeoenvironmental and geoarchaeological potential which will be addressed by detailed recording and the recovery of samples during the forthcoming evaluation of the adjacent North Woolwich portal site. The evaluation will also provide a better opportunity to identify archaeological remains which may be preserved in these deep alluvial deposits.

The interventions for this watching brief were too shallow to observe the deeper paleoenvironmental and geoarchaeological potential, as stated above, thus no further information could be retrieved which would identify areas of greater archaeological, paleoenvironmental and geoarchaeological potential and assist in the planning design for the forthcoming trial trenches.

10.1 Importance of Resources

The importance of the excavated remains has been assessed using professional judgement, informed, where applicable, by the criteria for assessing the national importance of monuments (DCMS 2010, Annex 1).

The main reason for the watching brief was as a precautionary measure to ensure significant archaeological remains were not damaged without record rather than to determine their significance or potential. However, the lower alluvial deposits exposed in the sections of the enabling works trenches are interpreted as having uncertain rarity and diversity.

While there is still potential for significant remains within these deposits, the deposits excavated during this watching brief and the records made can be assessed as being of **low importance**.

11 Conclusions

The conclusions inferred below directly relate to the interpretation and analysis of the results recorded from the general watching briefs undertaken at North Woolwich Portal combined with the knowledge gained from the geoarchaeological deposit model (Crossrail and Mola 2008) and the geoarchaeological borehole survey included as part of the Method statement for this general watching brief (Mola 2011).

11.1 Geology

Natural geology was not observed during the course of fieldwork.

11.2 Prehistoric

The blue-grey silty clays which were consistently discovered beneath the modern overburden represent the minerogenic part of the alluvial sequence. These sediments could have preserved evidence of prehistoric and early historic activity. However, no prehistoric or early historic remains were observed during the course of fieldwork.

The peat deposits of the marginal marshlands within LZ3 could have preserved evidence of prehistoric wetland activity, such as Bronze Age trackways or platforms and organic remains. However, no such structures or organic remains were identified during the archaeological monitoring of the deeper diversion trenches.

While no archaeological features were encountered, the deposits themselves still have the potential to contain significant palaeoenvironmental evidence which will be addressed through detailed recording and the recovery of samples during forthcoming evaluation at North Woolwich portal.

11.3 Roman remains

There was no archaeological evidence to suggest Roman activity or occupation in this area. The possible Roman road which was suggested to have run north-south across the area linking the higher ground of the north down towards the ferry crossing at North Woolwich was not observed during the course of fieldwork.

11.4 Medieval remains

Medieval remains were not observed during the course of fieldwork.

11.5 Post-medieval remains

Post-medieval remains were not observed during the course of fieldwork. There was no evidence of land reclamation in the form of dykes and ditches as expected. Industrialisation has changed the character of the area. The modern made ground

presumably belongs to the 19th and 20th centuries. The dumps/levelling deposits which were visible on the north and south profiles of the diversion trenches at the western end of factory road appear to be associated with consolidating the ground for the laying down of the roadway or the railway line. Some sections of these dumps had been disturbed and redeposited due to previous utility diversion works.

12 Post-excavation assessment, analysis, publication and dissemination proposals

The watching brief results will initially be disseminated via this report. The supporting site archive of finds and records (including digital data), post-excavation assessment, analysis and publication proposals will be considered in relation to later fieldwork in the wider context of archaeological potential and results across the Crossrail scheme.

A summary report will be published in the London Archaeologist excavation round up and also deposited with the LAARC.

13 Archive deposition

The site archive containing original records and finds will be stored temporarily with MOLA pending a future decision over the longer-term archive deposition and public access process for the wider Crossrail project.

14 Bibliography

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15 Acknowledgements

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16 NMR OASIS archaeological report form

OASIS ID: molas1-128646

Project details

Project name	Archaeological Watching Brief on Utility Diversions at North Woolwich Portal
Short description of the project	A general watching brief was undertaken by MOLA at the North Woolwich Portal worksite (part of Crossrail contract C263 Archaeology Late East) which consisted of utility diversions centred around Albert Road and Factory Road. This work was undertaken as part of a wider programme of assessment to quantify the archaeological implications of railway development proposals along the Crossrail route. The North Woolwich portal site lies within an Archaeological Priority Area. There are no scheduled monuments or listed buildings within the site. Underlying the tarmac surface, modern make-up varied in depth from 0.70m to 2.5m below ground level. Generally, trenches excavated to a depth of 2.0m and deeper revealed alluvial soils under modern made ground and tarmac. No archaeological remains were exposed within the shallow sequences. A minerogenic alluvium and peat sequence was recorded beneath modern made ground and tarmac in the deeper trenches which were excavated to a depth of c3.0-4.0m below ground level. The potential for palaeoenvironmental and topographic evidence within the alluvium and peat sequence was moderate to high. However, fieldwork has demonstrated that little archaeology remains within the deeper alluvial sequences. Timbers preserved within the peat deposits were of no archaeological significance, representing driftwood preserved within the marginal wetland. No archaeological structures or associated features indicative of human occupation were observed. At the western end of Factory road, by the Tate and Lyle Sugar Factory, a series of levelling and dump deposits were revealed within the upper made ground to a maximum depth of 2.0m below ground level. These are likely to represent the foundations for the construction of the North London line railway established here in 1847. Natural geology was not exposed.
Project dates	Start: 01-07-2011 End: 30-03-2012
Previous/future work	Not known / Yes

Any associated project reference codes	XSV11 - Sitecode
Type of project	Recording project
Site status	None
Current Land use	Industry and Commerce 1 - Industrial
Investigation type	"Watching Brief"
Prompt	Direction from Local Planning Authority - PPS

Project location

Country	England
Site location	GREATER LONDON NEWHAM NEWHAM North Woolwich Portal
Postcode	E16 2DY
Site coordinates	TQ 2700 0000 50 0 50 47 06 N 000 11 53 W Point

Project creators

Name of Organisation	MOL Archaeology
Project brief originator	Crossrail

Project design originator	Crossrail
Project director/manager	David Divers
Project supervisor	Rachel English
Type of sponsor/funding body	Crossrail Ltd
Name of sponsor/funding body	Crossrail Ltd

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Archaeological Watching Brief on utilities diversion at North Woolwich Portal
Author(s)/Editor(s)	English, R.
Date	2012
Issuer or publisher	MOLA
Place of issue or publication	London

Description	Fieldwork Report
Entered by	Rachel English (renglish@mola.org.uk)
Entered on	19 June 2012

17 Figures

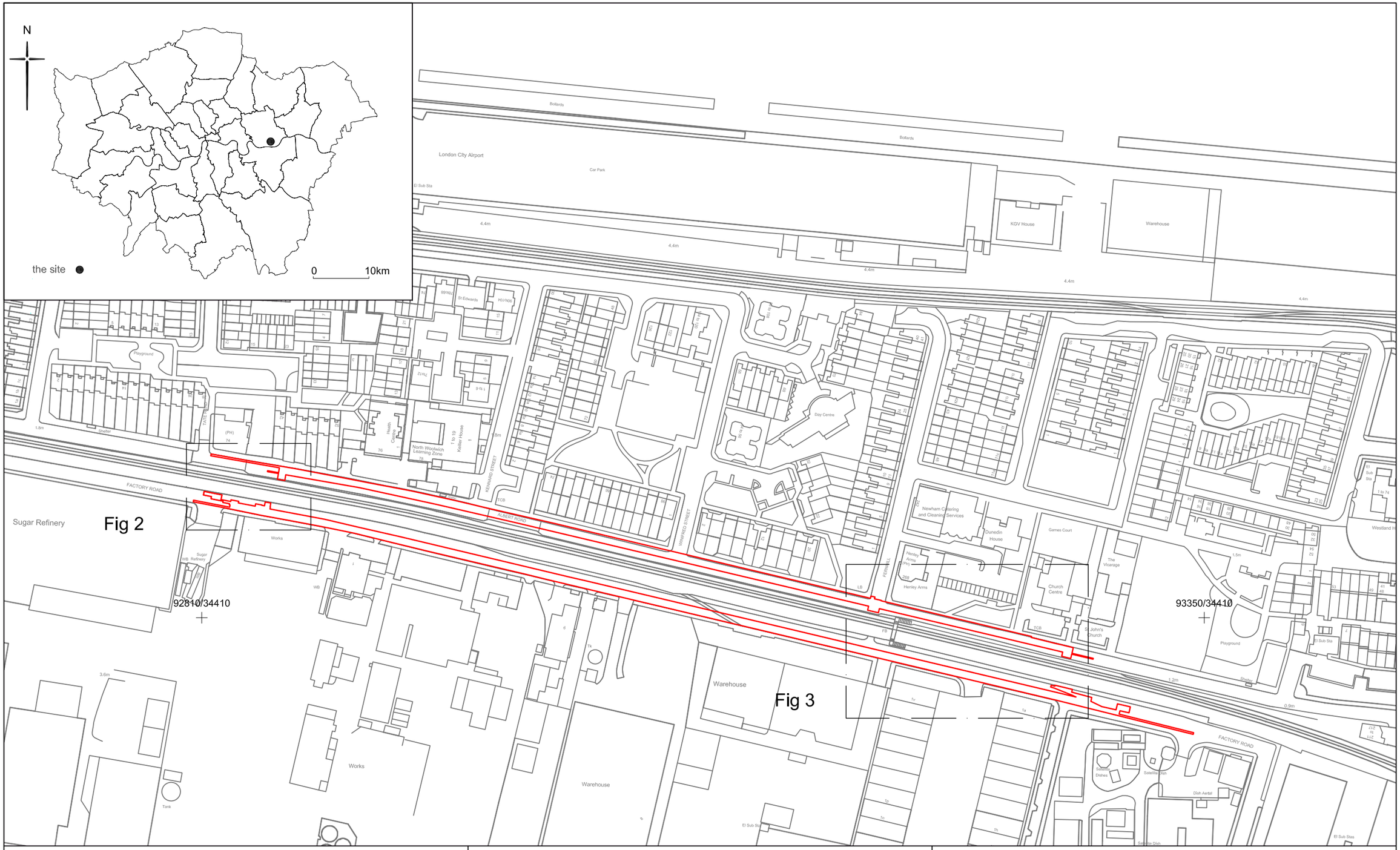

Fig 1 Site location

Trench edge

Location of additional figures

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0 50m

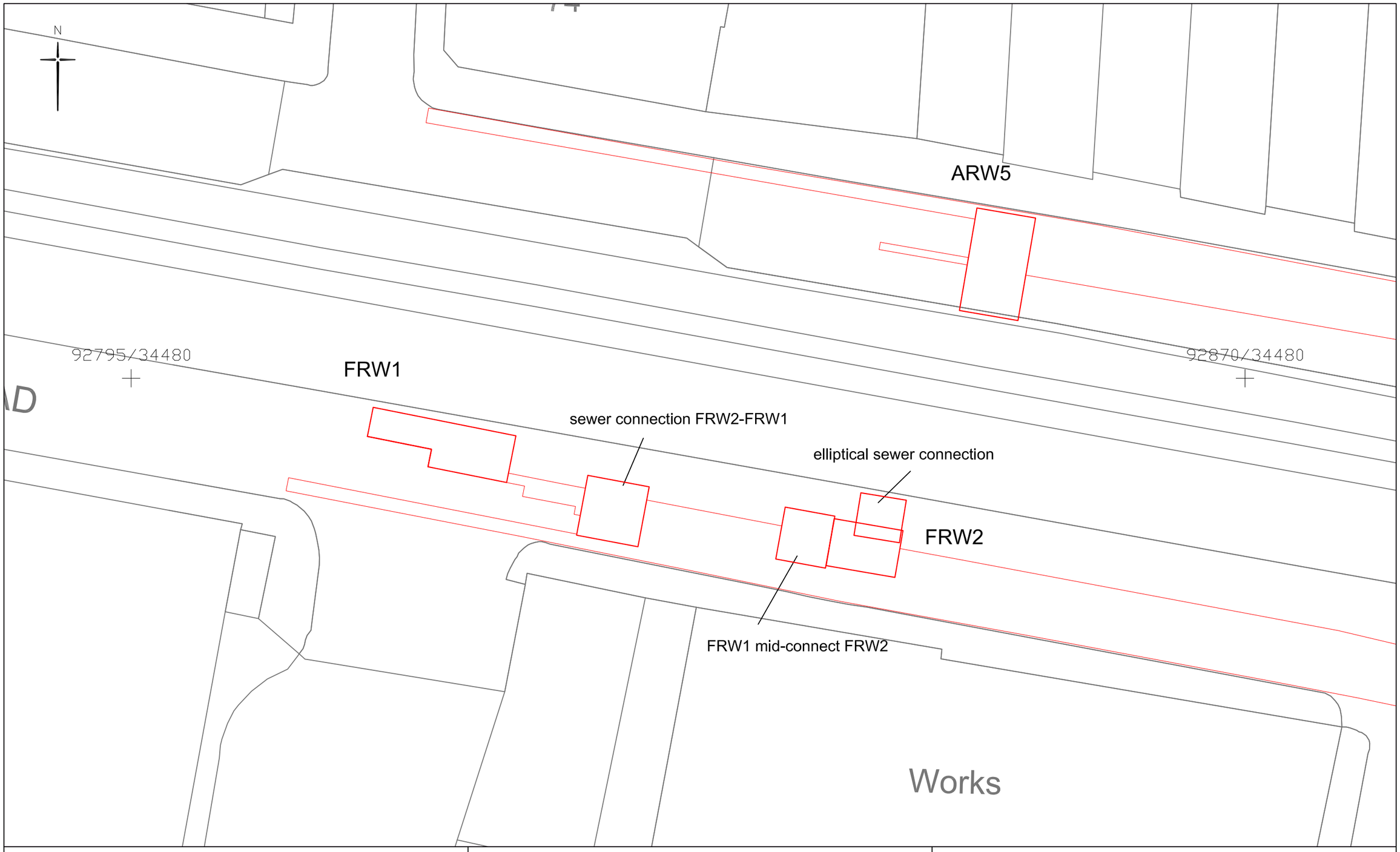

Fig 2 Location of utility chambers at west end of Albert and Factory Road

Trench edge
Watching brief area

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0 17.5m

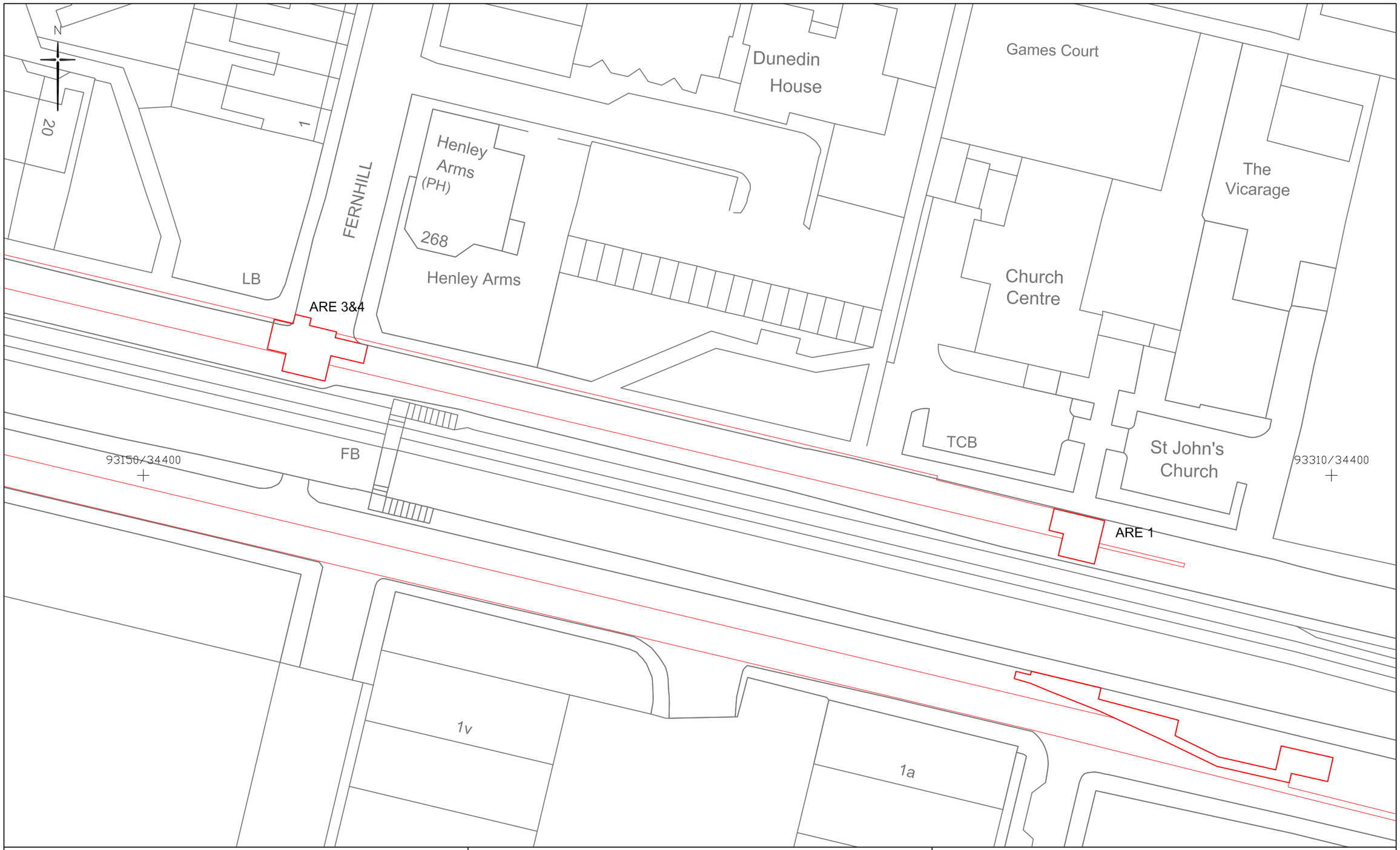

Fig 3 Location of utility chambers at east end of Albert and Factory Road

Trench edge
Watching brief area

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0 70m

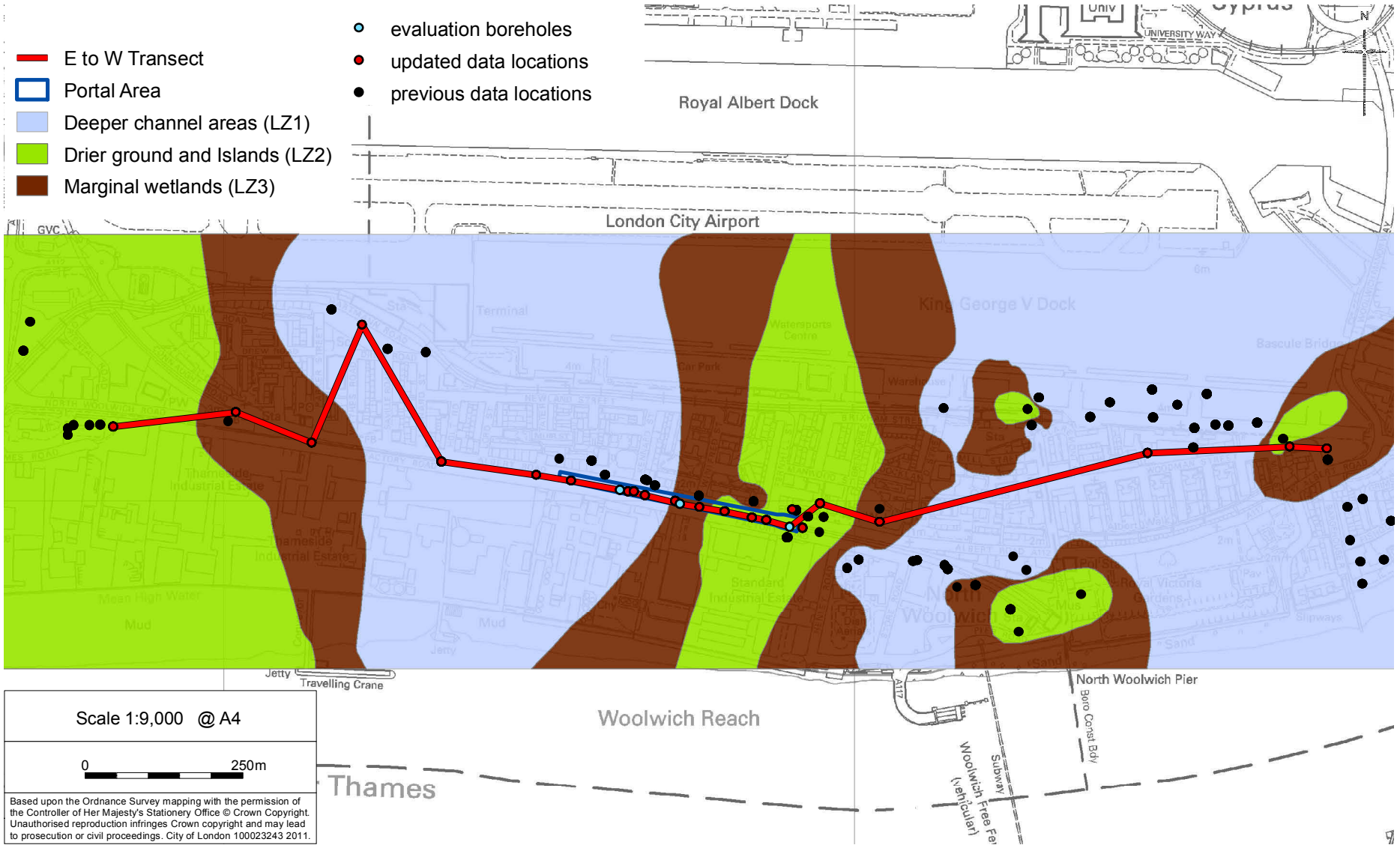

Fig 4 Landscape zones