C261 WORK PACKAGE ARCHAEOLOGY EARLY EAST

Fieldwork Report: Archaeological General Watching Brief

Pudding Mill Lane Portal

Excavation works for National Grid (XSK10)

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Non technical summary

This report presents the results of an archaeological general watching brief carried out by Museum of London Archaeology (MOLA) on Crossrail remediation works within Pudding Mill Lane Portal, National Grid bulk supply point, 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 to mitigate the archaeological implications of railway development proposals along the Crossrail route.

The National Grid Area bulk supply point was excavated in strips over an area of c 5,250 sq m to an average depth of 1.5m below ground level, for the purpose of environmental ground remediation.

The alluvial sequence was seen between 101.60m ATD and 103.50m ATD across the entire site. The alluvium consisted of bluish grey clay deposited in the floodplain of the River Lea. A watching brief in 2014 (MOLA 2014, included as Appendix 1) monitored a number of geotechnical boreholes and trial pits on the site. These identified the top of Shepperton/Lea Valley gravels at c 99.5m ATD to 100m ATD, overlain by low lying organic deposits at c 100.6m ATD and subsequently by a Holocene alluvial sequence lying at c 101.44m ATD to 103.74m ATD.

The upper horizons of the alluvium had been largely reworked as a result of post-medieval landscaping of the marsh. This preceded the first development of the site in the mid-19th century. A number of building remains and features, including wells and timber lined pits, were found that date to this period, and are likely to relate to industries shown to be present on the site by 1862, including a soap works and tar works. Also present was a large clinker deposit, possibly relating to presence of the railway or other industrial activity in the area.

Significant finds include two parish boundary marker stone pillars bearing inscriptions and a lead quart measure also bearing an inscription.

The 19th–century building remains and features were overlain by 19th and 20th–century land fill deposits and made ground. These had been truncated and reworked more recently by modern services.

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1 Introduction

Crossrail is a new cross-London Rail Link project which will provide transport routes across the south-east of England and London. The route will link Reading in the west with Shenfield in the north-east and Abbey Wood in the south-east. In central London, from Royal Oak in the west to Pudding Mill Lane and Royal Victoria Dock in the east, Crossrail will consist of a tunnelled section with seven new stations linked to the existing transport network.

The excavation for the National Grid bulk supply point remediation works was located in the southern part of the Pudding Mill Lane Portal, east of the River Lea, south of the great Eastern Main Line railway embankment and about 1km south-west of Stratford Station, in the London Borough of Newham.

An area of *c* 5,250 sq m was excavated in strips to an average depth of 1.5m to enable environmental remediation works ahead of construction for the National Grid bulk supply point.

The Crossrail mitigation response to archaeology is described in the Crossrail Generic WSI (Crossrail 2012a) 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 (ie 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.
- 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 an archaeological general watching brief (GWB) carried out during the excavation of the above-mentioned site, located in the southern area of Pudding Mill Lane Portal, by Museum of London Archaeology (MOLA) under Crossrail contract C261 Archaeology Early East. The approximate centre of the excavation area is at Ordnance Survey National Grid Reference 537670 183270.

The excavation was conducted under C261 Archaeology Central [sic] Addendum to Method Statement: *Archaeological General Watching Briefs Pudding Mill Lane Portal (Doc. No. C261-MLA-T1-GMS-CRG03-50002, Version 2.0, 01.12.14)*, an addendum to the original MOLA, C261 Archaeology Early East *Method Statement: Archaeological Targeted Watching Briefs Pudding Mill Lane Portal (Doc. No. C261-MLA-T1-GMS-CRG03-50001)*.

All fieldwork was conducted by MOLA Senior Archaeologists, Tim Johnston, Rob Hartle and David Sankey between 01/11/14 and 16/03/15.

Task	Principal Contractor	Dates
• **General Watching Brief** on ground reduction works (Fig 2). This includes: • The removal of the concrete layer. • The removal of contaminated soil from two initial 6m by 75m areas with reduction to a depth of 1.5m. • The further removal of contaminated soil from other areas of the site (outside the two initial 6m wide areas) as required to a depth of 1.5m**,** including the removal of contaminated features.	C350 Morgan Sindall	01/11/14–16/03/15

Table 1 Site Details

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.

The event code (site code) is **XSK10**.

2 Planning background

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/about-us/crossrail-act-2008/environmental-minimum-requirements-including-crossrail-construction-code#).The requirements being progressed follow the principles of Planning Policy Guidance Note 16 (PPG16)(DoE, 1990), and its replacements Planning Policy Statement 5 (PPS5)(DCLG, 2010) and the National Policy Planning Framework (NPPF)(DCLG, 2012), on archaeology and planning. 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 Act (2008) concern matters relating to archaeology and the built heritage and allows the dis-application by Crossrail 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 Historic England given that Schedule 9 effectively dis-applied their existing rights to the Crossrail project, and Schedule 15 allows Crossrail 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 Historic England in relation to listed buildings and with the Department of Culture, Media and Sport (DCMS) and Historic England 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 Chartered Institute for Archaeologists (CIfA, 2014). 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.

4 Previous work relevant to archaeology of site

The principal previous Crossrail studies are as follows:

- Crossrail, February 2005a *Environmental Statement*
- Crossrail, February 2005b *Assessment of Archaeology Impacts, Technical Report. Part 2 of 6, Central Section: Westbourne Park to Stratford and Isle of Dogs. 1E0318-C1E00-00001 [Specialist Technical Report (STR)]*
- Crossrail, 2008 *Archaeology Detailed Desk Based Assessment, Pudding Mill Lane Portal (Doc. No. CR-SD-CT1-EN-SR-00001, Version 1.0, 21.04.08)*
- Crossrail, 2013 *C261 Archaeology Early East, Enhanced Interim Statement: Archaeological Excavation on EIP/TBM Chamber and Watching Briefs on Cut and Cover Section 1 and Barbers Road Utilities, Pudding Mill Lane XSK10 (Doc. No. C261-MLA-X-RGN-CR140-50123)*

In addition a Fieldwork Report was completed following an archaeological watching brief during ground investigations at the site commissioned by the National Grid, under the sitecode **PDN14** (MOLA, 2014 *WorleyParsons for National Grid, Fieldwork Report, Archaeological Watching Brief on Ground Investigations Bulk Supply Point, Pudding Mill Lane*, v1.0 10.11.14; included as Appendix 1).

All on-site archaeological work was carried out in accordance with the following documents:

- Crossrail 2010. *Package C152 Pudding Mill Lane Portal Archaeology Site-Specific Written Scheme of Investigation (Doc. No. C152-SWN-C2-RSI-CR094_PT002-00001)*
- C261 Archaeology Early East Method Statement: Archaeological Targeted Watching Briefs Pudding Mill Lane Portal (Doc. No. C261-MLA-T1-GMS-CRG03-50001, Version 2.0, *13.10.14*)
- C261 Archaeology Central Addendum to Method Statement: *Archaeological General Watching Briefs Pudding Mill Lane Portal (Doc. No. C261-MLA-T1-GMS-CRG03-50002, Version 2.0, 01.12.14)*

The above cited reports are all available from the London Archaeological Archive and Research Centre (LAARC).

5 Topographical, Archaeological and Historic Background

The geological and topographical setting was covered in detail in the WSI v2, and a recent watching brief on the site on behalf of National Grid (MOLA, 2014 *WorleyParsons for National Grid, Fieldwork Report, Archaeological Watching Brief on Ground Investigations Bulk Supply Point, Pudding Mill Lane*, v1.0 10.11.14) has identified the following:

1. A Holocene alluvial sequence, including low-lying marginal organic deposits adjacent to the previously identified gravel island to the east of the site. The gravel island may extend into the north-eastern part of the National Grid site, as indicated by the rising surface of the gravel. The organic deposits could be contemporary with the Bronze Age activity previously located to the east of the site.
2. Victorian to Edwardian remains of brick and cobbled surfaces, small gauge railway lines, and storage tanks, which may relate to either the late 19th-century lamp works at Oil Wharf, or a soap works.

6 Research objectives and aims

6.1 Overall Research Aims

The original aims and objectives were listed in the WSI (Crossrail 2010) and stated that ‘data collected from archaeological investigation and mitigation may contribute to the following research themes’:

- Understanding London’s hydrology, river systems and tributaries and the relationship between rivers and floodplains;
- Understanding the relationship between landscape, river and settlement;
- Using the understanding that comes from reconstructing London’s past to contribute to wider environmental studies about contemporary concerns such as: climate change; sea level fluctuations; flood defence initiatives; links between pollution, health and quality of life;
- Understanding the reasons for evolution of the road systems, street layouts, river crossings and ferries, and their importance as engines of development and change;
- Understanding the nature and meaning of the deposition of metalwork in the Thames and at the headwaters of river tributaries;
- Understanding how water supply and drainage provision were installed and managed;
- Studying the correlation between sites associated with watercourses and meander bends, so as to understand the origin of settlements; and
- Understanding the evolving character of development in central London, in comparison to other riverine settlements.

Furthermore, the potential at Pudding Mill Lane for geo-archaeological and palaeoenvironmental deposits to be recovered will contribute to the following themes:

- The development of models for understanding the significance of geomorphology, ecology, ecosystems and climate, hydrology, and vegetational and faunal development, on human lives;
- Characterising changing climatic conditions, and air and water quality and pollution, throughout the archaeological record, towards understanding its implications for how people behaved;
- The Mesolithic/Neolithic transition: understanding the significance of horticultural experimentation at this time, and the transition from hunter-gatherers into farmers; and
- Understanding what London's past environments meant to different groups and individuals.

Any evidence for Post-medieval industrial activity will contribute to the following themes:

- Charting how and why different parts of London developed as specialist producers, and understanding the implications of this for London as a world city;
- Establishing how daily work and life in London reflected and contributed to the rise of London as the commercial centre of the British Empire, and to its continued eminence as a world city thereafter; and
- Examining the success with which small towns in the London region adapted to the capital's growth.

6.2 Objectives of the General Watching Brief

The following site-specific objectives were set out within the *Addendum to Method Statement Archaeological General Watching Briefs Pudding Mill Lane Portal* (Doc. No. C261-MLA-T1-GMS-CRG03-50002, Version 2.0, 01.12.14):

- To record the archaeological sequence (as restricted by contamination), mitigating the impact of the works.
- To identify the rail lines and the associated industrial archaeological features, allowing them to be related to any future work on the site.
- To identify the levels and nature of the Holocene alluvial sequence (if exposed in this work).
- To compare the results of this general watching brief with those of the earlier and future archaeological fieldwork in and around Pudding Mill Lane.

7 Methodology of site-based and off-site work

All archaeological excavation and recording during the fieldwork was carried out in accordance with the method statements listed in Section 4, and:

- English Heritage Centre for Archaeology Guidelines, 2002, Environmental archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation
- English Heritage, 2004, Geoarchaeology: using earth sciences to understand the archaeological record
- Museum of London *Archaeological Site Manual* (MoL 1994)
- English Heritage, July 2009, Standards for Archaeological Work, London Region, External Consultation Draft
- English Heritage, Greater London Archaeology Advisory Service (GLAAS), February 2014, Standards for Archaeological Work, London Region
- Crossrail 2012a. Archaeology Generic Written Scheme of Investigation (Doc. No. CR-XRL-T1-GST-CR001-00003)
- Crossrail 2012b. Archaeology: Specification for Evaluation & Mitigation (including Watching Brief) (Doc. No. CRL1-XRL-T1-RSP-CRG03-50001)

The site records can be found under the site code **XSK10** 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.

8 Summary of methodology

For the General watching Brief:

- The C261 Principal Contractor (Morgan Sindall) excavated the area in strips at average dimensions of *c* 8m x *c* 60m to depth of 1.5m below ground level (bGL), (103.10m ATD), with the exception of areas 1 and 3 which were bulk excavated due to confinements of space, also to a depth of 103.10m ATD.
- All ground reduction was monitored by MOLA.
- Localised excavation to a maximum depth of 2m bGL (102.60m ATD) occurred in specific areas where contaminated deposits or features needed removing to greater depth.
- Excavation was halted at the request of MOLA, where archaeological features were observed.
- Archaeological features were recorded by plan drawing and photography, and appropriate samples taken, where contamination allowed.
- All areas and where requested by MOLA, archaeological deposits and features, were surveyed by C350 engineers. This data was shared with MOLA which enabled hand drawn plans to be accurately located and an accurate ‘Master Arch’ drawing to be produced.

9 Results and observations including stratigraphic report and quantitative report

9.1 National Grid Area bulk supply point, south-western part (strips 1–10, see Fig 2)

National Grid Area bulk supply point, south-western part	
Location	Pudding Mill Lane, National Grid Area
Dimensions	60m north-east–south-west x 65m north-west–south-east, 1.5m deep
LSG coordinates	88060 37837
OS National grid coordinates	537670 183270
Modern Ground Level/top of the slab	104.60m ATD
Modern subsurface deposits	Concrete slab to maximum 0.20 bGL (104.40m ATD)
Level of base of archaeological deposits observed and/or base of trench	103.10m ATD
Natural observed	Alluvial clays observed at between 103.80m ATD and 102.70m ATD; however, it is redeposited in parts. Where naturally accumulated on the River Lea flood plain it remains undated, although would have accumulated during the Holocene and into the post-medieval period (see *Interpretation and summary* below), so may not necessarily be archaeologically sterile.
Extent of modern truncation	Concrete slab to maximum 0.20m bGL (104.40m ATD)
Archaeological remains	**Dating Evidence, Finds, and Samples**
A bluish-grey alluvial clay was seen over the entire site at between 103.80m ATD and 102.70m ATD (Photo 1). This alluvial clay had been reworked in the upper horizons of the deposit, in places. The exact boundaries between reworked alluvial clay and natural alluvial clay observed in situ was, however, unclear. A number of archaeological features were cut into the alluvium; these were:	None

A number of small channels cut into the alluvial horizon. It was unclear whether these were natural or archaeological. Ceramic building material was recovered from the fill of one [142].	[142] Ridge tile, Pantile 1630–1800/1900 (although likely to be mid-17th–18th century.
A small amount of wattle [163] was recorded lying within the alluvial clay at the southern end of Strip 3 (Fig 2). The remains were ephemeral but extended over 2.80m in length and aligned in a north-east/south-west direction, at approximately 103.10m ATD.	None.
Two timber box structures [138] located at the southern end of Strip 3, and [145] located in the centre of Strip 5 (Fig 2, Photo 2). Structure [145] measured 0.90 x 1.40m and 1.20m deep. This was constructed from squared, sawn timbers of the same length stacked vertically and flush, and retained with narrower sawn planking at each end. The other [138] was larger at c 3m x 2m. Both were filled with a loose, soft black deposit that looked to be the result of industrial dumping and contained an oily or tar like substance. The odour and environmental monitoring on site suggested it was heavily contaminated with hydrocarbons.	[131], fill of [138] Stoke-on-Trent and north Midlands wares of the early to mid- Victorian period Two refined whiteware with blue transfer-printed decoration (MOL fabric code TPW2) dinner plates Two yellow ware (YELL) chamber pots London stoneware with Bristol glaze low inkstand (LONS) – 1873 Glass medicine bottle –second half 19th cen. Glass bottle – 1856 Quart size spouted measure (spout missing). Engraved with names of owner and pub ‘G Kent, Albion, Old Ford’, in sub-rectangular cartouche defined by a border of three chased interrupted lines (wrigglework). Pewterer’s stamp to left of this below rim, measure size engraved just to left of carinated handle, which has the initial ‘K’ carved into the angle near the rim (facing the user). See Photo 3.
Two barrel wells: [149] located in the centre of Strip 6 and [154] located in the centre of Strip 7/8 (Fig 2, Photo 4). Both of these features consisted of two wooden staved barrels with iron hoops, stacked vertically on top of each other with the lid and bases of the barrels missing. The tops of these lay at 103.10m ATD. Both were cut into the alluvium to a depth of 101.60m ATD, and were filled with a greenish oil like substance suggested by on site environmental monitoring to be heavily	None.

contaminated with hydrocarbons.	
Three brick wells, [158] located in the south-east corner of Strip 10, [157] located in the south of Strips 7/8 and 9 and [156], located in the south of Strip 7/8 (Fig 2). The largest of these [157] measured 3.50m in diameter with [156] being 2m and [154] measuring 1.5m. All of these were constructed from red frogged brick and London Yellow Stock brick. The tops of all the wells were recorded at *c* 103.80m ATD. The depth of all the wells is unknown as they were not fully excavated and all were removed down to formation level at 103.10m ATD.	London Yellow Stock brick (not retained) 19th/20th–century
A number of 19th/20th century building foundation remains, including a substantial foundation [152] that ran in an east–west direction through the centre of Strips 6, 7/8 (Fig 2) for 17m and was 0.50m wide. These were constructed from a mixture of frogged dark red (mauve) bricks and London Yellow Stock bricks bonded with cement and hard light yellow (beige) mortar. They survived to varying heights and [152] was cut into the alluvium to a depth of 0.20m. It was not possible to fully record the foundations due to the level of contamination in these areas.	London Yellow Stock brick (not retained) 19th/20th–century
Several sub-square pits containing a soft white substance. The substance has been identified as calcium sulphate or 'Leblancite' after testing by the on-site environmental contractor. The pits were cut into the alluvium to varying depths, the base of the deepest being c 102.80m ATD. They are typically c 2–3m square (Photo 5).	None
A made-ground industrial deposit [148] distinct from [144], seen in the north-east corner over an area of *c* 25m x 30m. Blackish in colour and consisting mainly of clinker and ash mixed with silt. It extended to a greater depth than [144] (up to 102.60m ATD (2m bGL) in places, and may have lain within a cut that truncated the alluvium. Contained	[148] clay tobacco pipe – AO29 type, 1840–80 Stoke-on-Trent ware, North Midland ware, refined whiteware and yellow ware – early Victorian

occasional stones and frequent concentrations of broken 19th/20th ceramics and glassware.	
A made ground deposit [144] distinct from [148], blackish in colour and consisting of a mixture of industrial type deposits, rubble and building material fragments, and silty clay. Seen across the entire site at between 104.50m ATD and 103.30m ATD.	[144] Various ceramics – second half 19th–century
Two timber piles [139/140] driven into the alluvial clay, located at the southern end of Strip 3 (Fig 2).The timber is 'box-squared' and sawn, and species type-new world soft wood.	None

Interpretation and summary

The top of the alluvial sequence, consisting of bluish-grey alluvial clay was seen across this entire area of site. The alluvium accumulated in the flood plain of the River Lea and its tributaries. No dating evidence was present in the alluvium, although the sequence would have continued to accumulate throughout the Holocene from above the low lying organic (peat) deposits and into the post-medieval period, as indicated by geotechnical boreholes and trial pits (MOLA 2014). Comparative levels of the alluvial sequence in the Cut and Cover Section 1 excavation were thought to be later than 1480–1550 (C261-MLA-X-RGN-CR140-50123).

Within the alluvium was a section of ephemeral wattle-work [163]. The wattle is undated but follows a similar alignment to sections of wattle excavated to the north within the EIP/TBM chamber, and thought possibly to be part of one or more successive fish weirs, although it was recorded at a higher level (approximately 103.10m ATD, compared with a highest level of 102.04m ATD for the structures to the north).

A number of small shallow channels were observed cutting through the alluvial clay over this area of site, although it is unclear whether they were natural or man-made. The fill of one [142] contained a small amount of ceramic building material (ridge tile and pantile), dated to the mid-17th or 18th centuries.

A box squared, sawn timber post, recorded in the south of Strip 3 [139/140] was driven into the alluvium and is likely to be a 'setting out' post for Victorian construction works. This would no doubt relate to the construction of one of the many industrial buildings shown to inhabit this part of the site on historic maps by 1862. Stanford's map of 1862 (Fig 7) shows the site by this time to contain a soap works, tar works and Gas works, as well as other unlabelled buildings to the south of the soap works, presumably of an ancillary industrial nature. The embanked railway, bounding the site to the north is also shown for the first time on Stanford's map. Most of the features and deposits that were present on site are undoubtedly associated with the various industries shown to be present.

The sub square pits, recorded in numerous locations, contained a substance identified from testing by the on-site environmental contractor, as calcium sulphate or 'Leblancite'. This is known to be a waste product of the Leblanc process, widely

used in 19th century industrial processes, including soap manufacture. It is most likely, therefore, to be a result of the disposal of industrial waste from the soap works.

A number of wells were seen across this part of site. The majority [156], [157] and [158] were circular brick wells backfilled with rubble, although the bricks themselves are 19th century in date. All of the brick wells were located in the south-east part of this area (Fig 2). Two barrel wells, [149] and [154] were seen, and were constructed from two wooden staved barrels stacked atop one another. This method of constructing a well provides a cheaper and quicker alternative to the more substantial brick wells and may suggest that [149] and [154] had a more temporary function than that of their brick constructed counterparts. The various wells are likely to have provided water for industrial activities in this part of site.

A number of brick walls and foundations were seen across this area of site, many of which could not be recorded due high levels of contamination within the trench. One of these, [152], survived at 17m long and could be part of one the unlabelled buildings on Stanford's map, shown south of the soap works.

Two rectangular timber box structures [138] and [145] were present in the south-western part of this area. Their function remains unknown, but their disuse has been dated to the second half of the 19th–century, from ceramic and metallic finds recovered from their backfills. It is possible that they are timber lined pits, or possibly a more uncommon form of rectangular well.

One of these timber lined pits [138] was constructed using a reused timber as a corner post. It was originally used as a decorative 'imbowed' or moulded timber from a large ship, and contained typical ship treenails. Timbers such as this are generally similar in form from the mid-16th to early 19th centuries, and are therefore not datable on technological grounds (D. Goodburn pers comm).

In the north-east area of site, a substantial cut measuring at least *c* 25m x 30m in area was recorded, and truncated the alluvium on average to 2m bGL (102.60m ATD), around 0.5m deeper than the general made ground [144], that overlay it. The perimeter edge of the cut for this deposit was not observed entirely, but was recorded in the north-east part of site. The deposit within this pit [148] contained predominantly clinker as well as ash and silt. Clinker is a by-product from the combustion of coal, and is therefore likely to be associated with the small gauge railways shown to be present on site, or other coal burning related to industrial activities in the immediate area (eg, the gas works shown on the 1862 Stanford map). The dumping of this material has been dated to 1840–80 from clay tobacco pipes within it.

A made ground deposit [144] was seen over the entire site, most likely a result of general ground levelling following the disuse of the industrial properties.

9.2 National Grid Area bulk supply point, Area 1

National Grid Area bulk supply point, Area 1	
Location	Pudding Mill Lane, National Grid Area
Dimensions	60.5m north-west–south-east x average 10m north-east–south-west, 1.5m deep
OS National grid coordinates	537670 183270
LSG grid coordinates	88060 37837
Modern Ground Level	104.60m ATD
Modern subsurface deposits	Concrete slab to maximum 0.20 bGL (104.40m ATD)
Level of base of archaeological deposits observed	102.60m ATD
Natural observed	Alluvial clays observed at between 103.80m ATD and 102.70m ATD; however, it is redeposited in parts and remains undated, although would have accumulated throughout the Holocene (*see Interpretation and summary* below), so may not necessarily be archaeologically sterile.
Extent of modern truncation	Concrete slab to maximum 0.20 bGL (104.40m ATD)
Archaeological remains	**Dating Evidence, Finds, and Samples**
A bluish-grey alluvial clay was seen over the entire site at between 103.80m ATD and 102.70m ATD. This alluvial clay had been reworked in the upper horizons of the deposit, in places. The exact boundaries between reworked alluvial clay and alluvial clay observed *in situ* was, however, unclear.	None
A made ground industrial deposit [148] distinct from [144], seen in the north-east corner over an area of *c* 25m x 30m. Blackish in colour and consisting mainly of clinker and ash mixed with silt. The cut containing this deposit truncated the alluvium up to 102.60m ATD (2m bGL) in places. Contained occasional stones and frequent concentrations of broken 19th/20th	[148] clay tobacco pipe – AO29 type, 1840–80 Stoke-on-Trent ware, North Midland ware, refined whiteware and yellow ware – early Victorian

ceramics and glassware.	
A made ground deposit [144] distinct from [148], blackish in colour and consisting of a mixture of industrial type deposits and silty clay. Seen across the entire site at between 104.50m ATD and 103.30m ATD.	[144] Various ceramics – second half 19th–century
Two inscribed stones [161] and [162] (Fig 3 and Fig 4, Photo 6). These were located in approximately the centre of Area 1 (Fig 2). Both bore inscriptions referencing the initials of possible church wardens and dates between 1820 and 1867 and are probably parish boundary markers. [161] measured 1.55m x *c* 0.30m x *c* 0.30m and [162] 1.15m x *c* 0.26m x *c* 0.26m. Both tapered inwards slightly from base to top and had chamfered pointed tops.	Inscribed dates between 1820 and 1867

Interpretation and summary

The top of the alluvial sequence, consisting of bluish-grey alluvial clay was seen across this entire area of site. This is alluvium accumulated in the flood plain of the River Lea and its tributaries. No dating evidence was present in the alluvium, although the sequence would have accumulated throughout the Holocene from above the low lying organic (peat) deposits and into the post-medieval period, as indicated by geotechnical boreholes and trial pits (MOLA 2014). Comparative levels of the alluvial sequence in the Cut and Cover Section 1 excavation were thought to be later than 1480–1550 in date, although this cannot be verified for the sequence on this site.

The alluvium was truncated by a large pit containing a deposit consisting mainly of clinker [148] (*see interpretation and summary, section 10.1* above) in the south-eastern part.

Above this in the sequence, over the entire area was made ground deposit [144] (*see interpretation and summary, section 10.1* above).

Within the made ground [144] were two inscribed stone parish boundary markers [161] and [162] (Fig 3 and Fig 4, Photo 6). The boundary stone [161] bears an inscription on one face that reads: ’61 or I, WHP, 1864’. Boundary stone [162] bears an inscription on one face that reads: WHO GSC, 1845, G.G. RWC, 1857, JP RHS, CHURCH WARDENS, 1867’ and on an adjacent face: ‘MSB, 1820, WH CHURCH WARDENS’. Both stones were found standing near vertically, side by side within the made ground deposit [144]. It is unclear whether the stones were standing *in situ*, or whether they had been dumped within the made ground. The marker stones lie approximately 75m north-east of the river Lea, which marks the western boundary of the parish of West Ham, and similar marker stones are been noted from the area (eg, approximately 4km to the north-east in Balmoral Road at the junction with Hampton Road - http://www.newhamstory.com/node/965 last accessed 25.11.15.) Two boundary stones are noted a short distance to the east on the 1896 OS map of the area (Fig 5).

9.3 National Grid Area bulk supply point, Area 3

National Grid Area bulk supply point, Area 3	
Location	Pudding Mill Lane, National Grid Area
Dimensions	18m north-west–south-east x 27m north-east–south-west, 1.5m deep
OS National grid coordinates	537670 183270
LSG grid coordinates	88060 37837
Modern Ground Level	104.60m ATD
Modern subsurface deposits	Topsoil
Level of base of archaeological deposits observed	Concrete slab to maximum 0.20 bGL (104.40m ATD)
Natural observed	Alluvial clays observed at between 103.80m ATD and 102.70m ATD; however, it is redeposited in parts and where naturally accumulated remains undated, although would have accumulated throughout the Holocene (*see Interpretation and summary* below), so may not necessarily be archaeologically sterile.
Extent of modern truncation	Concrete slab to maximum 0.20 bGL (104.40m ATD)
Archaeological remains	**Dating Evidence, Finds, and Samples**
A bluish-grey alluvial clay was seen over the entire site at between 103.80m ATD and 102.70m ATD. This alluvial clay had been reworked in the upper horizons of the deposit, in places. The exact boundaries between reworked alluvial clay and alluvial clay observed *in situ* was, however, unclear.	None
A made ground industrial deposit [148] distinct from [144], seen in the north-east corner over an area of *c* 25m x 30m. Blackish in colour and consisting mainly of clinker and ash mixed with silt. The cut containing this deposit truncated the alluvium up to 102.60m ATD (2m bGL) in places. Contained occasional stones and frequent concentrations of broken 19th/20th ceramics and glassware.	[148] clay tobacco pipe – AO29 type, 1840–80 Stoke-on-Trent ware, North Midland ware, refined whiteware and yellow ware – early Victorian
A made ground deposit [144] distinct from [148], blackish in colour and consisting of a mixture of industrial type deposits and silty clay. Seen across the	None

entire site at between 104.50m ATD and 103.30m ATD.	
Numerous foundations and walls, forming one structure/building [160], located in the north-east corner of site (Fig 2, Photo 7). These were constructed of London Yellow Stock Brick on concrete foundations, and survived to a maximum height of 0.10m bGL (104.50m ATD). The foundations were cut into the alluvium. The depth of the foundations is unknown as the structure was reduced only to formation level at 103.20m ATD.	London Yellow Stock brick (not retained)
Interpretation and summary	
The top of the alluvial sequence, consisting of bluish-grey alluvial clay was seen across this entire area of site. This is alluvium accumulated in the flood plain of the River Lea and its tributaries. No dating evidence was present in the alluvium, although the sequence would have continued to accumulate throughout the Holocene from above the low lying organic (peat) deposits and into the post-medieval period, as indicated by geotechnical boreholes and trial pits (MOLA 2014). Comparative levels of the alluvial sequence in the Cut and Cover Section 1 excavation were thought to be later than 1480–1550 in date, although this date cannot be verified for the sequence at this site. Cut into the alluvium over the entire area of Area 3, were a number of walls and foundations of one large building. These were all constructed of London yellow Stock brick on concrete foundations. These are most probably part of an unlabelled building shown in the same location on the 1914 Ordnance Survey map (Fig 6). The building does not appear on the 1895 map (reproduced in Fig 5), suggesting a construction date in the late 19th or early 20th century. Two layers industrial dumping or made ground overlay these building remains [148] and [144] (see *Interpretation and Summary section 10.1* above).	

10 Assessment of results against original research aims

The current GLAAS guidelines (English Heritage, 2014) require an assessment of results against original expectations (these no longer mention the criteria for assessing national importance).

10.1 Original research aims

The original research objectives were met as follows:

- *To record the archaeological sequence (as restricted by contamination), mitigating the impact of the works.*

  The archaeological sequence was successfully identified and recorded over the whole site in areas of impact, where possible.

- *To identify the rail lines and the associated industrial archaeological features, allowing them to be related to any future work on the site.*

  No rail lines were present in the National Grid bulk supply point area. A large dumped deposit consisting mainly of clinker was however seen which may derive from railway activity.

- *To identify the levels and nature of the Holocene alluvial sequence (if exposed in this work).*

  The top of the Holocene alluvial sequence was seen. No dating evidence was present in the alluvium, and it is possible that it accumulated throughout the Holocene, although it is likely that some is of post-medieval date. Similar alluvium recorded during the excavation of the PML Cut and Cover Section 1 was post-medieval in date.

- *To compare the results of this general watching brief with those of the earlier and future archaeological fieldwork in and around Pudding Mill Lane.*

  The Pudding Mill Lane Portal Cut and Cover Section 1 and EIP/TBM chamber were excavated immediately north-west of the site. A small number of post-medieval brick remains were found dating to the 18th and 19th centuries. The post medieval structural remains were not as prolific due to the prevalence of concrete foundations and smaller area investigated.

  The alluvial sequence was comparable at both sites. The excavations at the EIP/TBM chamber identified a number of wattle and timber revetments, possibly part of one or more fish weirs lying within the alluvium and generally observed *c* 101.60 – 102m ATD. Within the alluvium at the national Grid site a section of ephemeral wattle-work [163] was recorded at c 103.10m ATD. The wattle is undated but follows a similar alignment to sections of wattle excavated to the north within the EIP/TBM chamber, and although it was recorded at a higher level, may have formed part of a similar structure.

10.2 Additional research themes

No further research themes have been identified.

10.3 Statement of potential (archaeology)

The results from the General Watching Brief have shown that a consistent stratigraphic sequence exists across the site, and into the top of the alluvial sequence, the lowest alluvial clay being recorded at 101.60m ATD. The Holocene alluvial sequence and any potential medieval features beneath accumulated alluvium not disturbed by this work remain intact below formation level. A number of 19th and 20th century structural remains and features were exposed in the form of brick wells, barrel wells and brick walls and foundations. These were cut into the upper horizon of the alluvial clay which is reworked. These features were all overlain by 19th-century landfill deposits and made ground of an industrial nature. This was truncated and reworked in many places by modern services running variously across the site.

The site was covered with concrete slab, the top of which lay at 104.60m ATD, to a depth of *c* 0.20m bGL and modern made ground between 0.10m and 0.20m thick.

10.4 Importance of Resources

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

The archaeological remains on site are assessed as being of low importance, but do however, have local significance. Information about the alluvial sequence can be incorporated into deposit models for the area, and the wattle-work, though ephemeral, may have some relevance if it can be related to structures recorded further to the north in the EIP/TBM chamber excavation. The 19th and 20th-century structural remains and features reflect the industrial nature of the site from the mid-19th century until modern times. They almost certainly are associated with the various 19th–century and onwards industries shown to be present on the site by historic maps. The parish boundary marker stones however, are a point of particular local interest, and add to local knowledge of parish boundaries in this area. Similarly the inscribed measure provides the name of a local public house and its landlord.

11 Conclusions

11.1 Geology

The top of the alluvial sequence was identified at between 101.60m ATD and 103.50m ATD. This consisted invariably of bluish-grey alluvial clay. This is alluvium accumulated in the flood plain of the River Lea and its tributaries. No dating evidence was present in the alluvium, although the sequence would have continued to accumulate throughout the Holocene from above the low lying organic (peat) deposits and into the post-medieval period, as indicated by geotechnical boreholes and trial pits (MOLA 2014). Comparative levels of the alluvial sequence in the Cut and Cover Section 1 excavation contained pottery dated 1480–1550, and a post-medieval date is likely at least for the upper sections of the alluvium.

11.2 Prehistoric to medieval

No deposits or residual artefacts of prehistoric, Roman, or medieval date were present in the watching brief.

11.3 Post-medieval remains

The earliest post-medieval activity seen on site is indicated by areas of redeposited alluvial clay. This is a result of ground-levelling before 19th–century construction on the site, previous to which the land would have been wet and marsh like, in the flood plain of the River Lea. A number of small channels were seen cutting through this, although they remain undated and it is unclear whether they were manmade or a result of natural processes. Within the alluvium a section of ephemeral wattle-work [163] was recorded at c 103.10m ATD.

The industrial use of the site from the 19th-century onwards is represented by a number of 19th/early 20th-century building remains and features. These include walls, wall foundations, wells and lined pits, including a building shown on the 1914 OS map of the area (Fig 6). These were cut into the top of the reworked alluvium. These building remains and features undoubtedly relate to the industries shown to be present on site by the time Stanford's map of 1862 was produced (Fig 7), although they are located to the south of the soap works labelled on the map. Evidence that the area was utilised by the soap works includes a number of pits that contained the substance calcium sulphate. Calcium sulphate is also known as 'Leblancite', as it is a by-product of the Leblanc process, and is known to have been used in 19th-century soap manufacture. A number of wells were recorded, mainly in the south-east of the site both of brick and more temporary barrel type. Their proximity to industry, and high density, would point to them primarily providing water for the industries in the immediate vicinity, such as the soap works and tar works.

A large landfill deposit [148] consisting largely of clinker was present in the south-east of site. This has been dated to 1840–80, within the same date range as the appearance of the first industrial use of the site. Clinker, being a by-product of the combustion of coal, may be related to the use of railways or other industrial processes on the site (such as the adjacent gas works, shown on the 1862 Stanford map, Fig 7). Although no rail lines were present in the area of the watching brief, the embanked mainline railway that bounds the north-west of the site is shown to be

present by 1862, and no doubt served the industries present on site with the possibility of other small gauge rail lines near to the site.

The two parish boundary marker stones found on site may help to elucidate parish boundary lines during the 19th century. The lead quart measure provides the name of a local public house, the Albion, and its landlord G Kent.

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

The fieldwork results will initially be disseminated via this report.

The fieldwork has produced results of low importance and local significance. The alluvial sequence and the section of ephemeral wattle-work may have relevance to archaeological deposits and features recorded elsewhere within the PML site, and it is suggested that these results are integrated within any future proposals for the Analysis and Publication of more significant remains recorded elsewhere within the Pudding Mill Lane site. A Summary Report for the Pudding Mill Lane GWB and TWB will be submitted for the annual excavation round up in London Archaeologist and also be deposited with the LAARC.

This decision lies with the Crossrail Project Archaeologist.

13 Archive deposition

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

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Thanks also to [redacted] of Morgan Sindall and their on-site team, for enabling and accommodating the on-site work.

Thanks to [redacted] for enabling the remediation work on site and advising on issues regarding contamination.

The general watching brief was supervised by Rob Hartle, Dave Sankey and Tim Johnston. The fieldwork was managed by MOLA Project Managers Elaine Eastbury and Simon Davis.

16 OASIS form

16.1 OASIS ID: molas1-233424

Project details

Project name	C261 Pudding Mill Lane GWB (National Grid Area)
Short description of the project	A general watching brief during ground reduction and removal of contaminated deposits at the Crossrail C261 Pudding Mill Lane portal, in the area of the National Grid bulk supply point, recorded a Holocene alluvial sequence, an ephemeral wattle structure of uncertain date and post-medieval cut features and foundations relating to the industrial use of the site from the 19th century. Two Parish boundary marker stones were also recorded within the alluvium.
Project dates	Start: 01-11-2014 End: 16-03-2015
Previous/future work	Yes / Yes
Any associated project reference codes	XSK10 - Sitecode
Type of project	Recording project
Monument type	BUILDING Post Medieval
Monument type	PIT Post Medieval
Monument type	WELL Post Medieval
Significant Finds	BOUNDARY MARKER Post Medieval
Investigation type	"Watching Brief"

Project location

Country	England
Site location	GREATER LONDON NEWHAM WEST HAM C261 Pudding Mill Lane Portal
Postcode	E15 1PW
Study area	7050 Square metres
Site coordinates	TQ 7670 3270 51.065816746188 0.522170309356 51 03 56 N 000 31 19 E Point
Height OD / Depth	Min: 103.8m Max: 103.8m

Project creators

Name of Organisation	MOLA
Project brief originator	Crossrail
Project design originator	Crossrail
Project director/manager	Louise Fowler
Project supervisor	Tim Johnston
Type of sponsor/funding body	Transport Infrastructure Body
Name of sponsor/funding body	Crossrail

Project archives

Physical Archive recipient	LAARC
Physical Archive ID	XSK10
Digital Archive recipient	LAARC
Digital Archive ID	XSK10
Paper Archive recipient	LAARC
Paper Archive ID	XSK10

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	C261 ARCHAEOLOGY EARLY EAST Fieldwork Report Archaeological General Watching Brief Pudding Mill Lane Portal Excavation works for National Grid (XSK10) CRL Doc No: C261-MLA-T1-RGN-CRG03-50029
Author(s)/Editor(s)	Tim Johnston

Date	2015
Issuer or publisher	MOLA
Place of issue or publication	London
Description	Unpublished client report (A4)
Entered by	Louise Fowler (lfowler@mola.org.uk)
Entered on	7 December 2015

OASIS:

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Cite only: http://www.oasis.ac.uk/form/print.cfm for this page

17 Figures

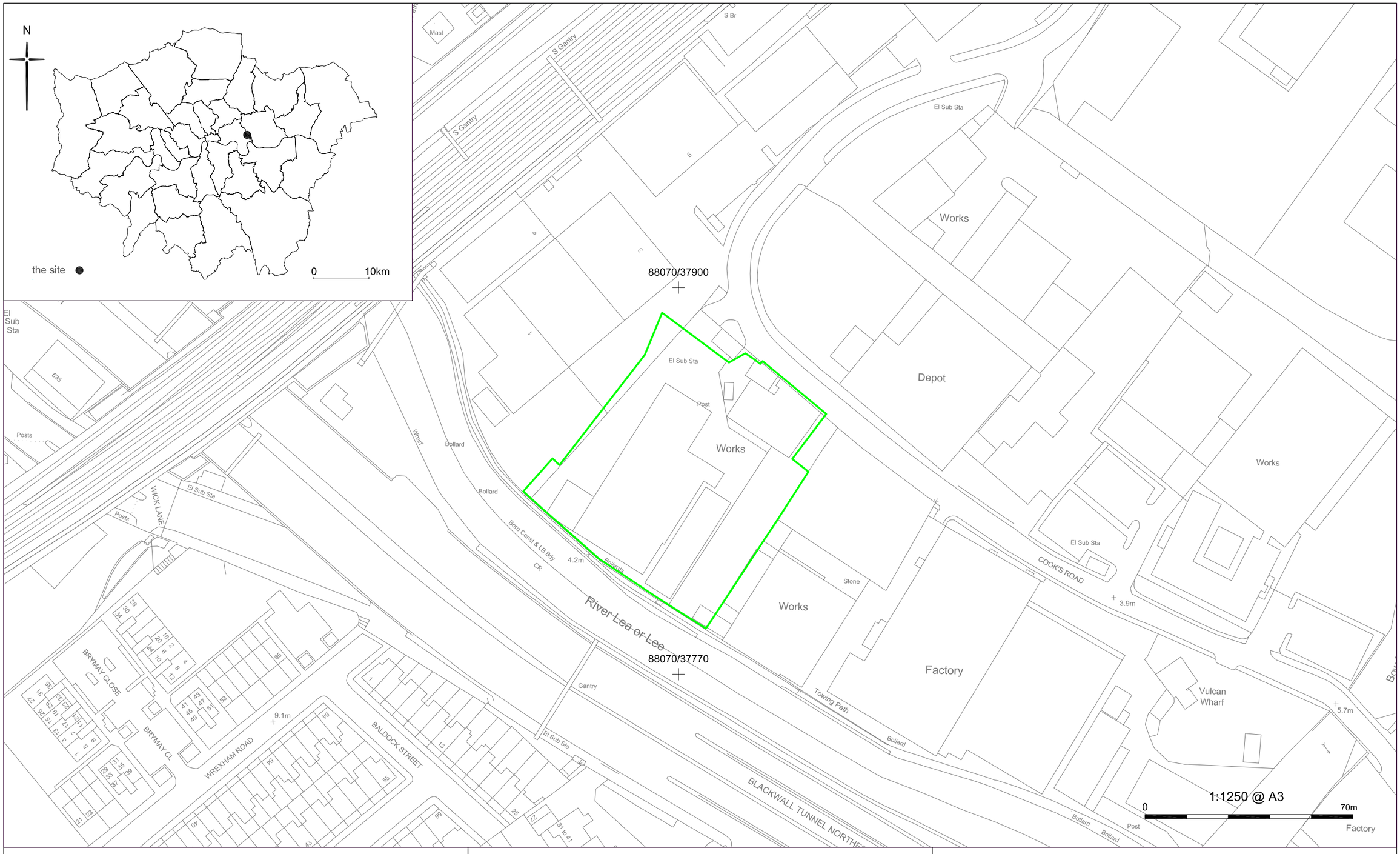


Fig 1: General Watching Brief Trench Location
Site code: XSK10
Figure type: Fieldwork report

Type of fieldwork:
General Watching Brief

Site Address:
Crossrail: (C261 work Package Area, Early East), Crossrail Pudding Mill Lane portal Site, Excavation works for National Grid

Trench edge / Watching brief area

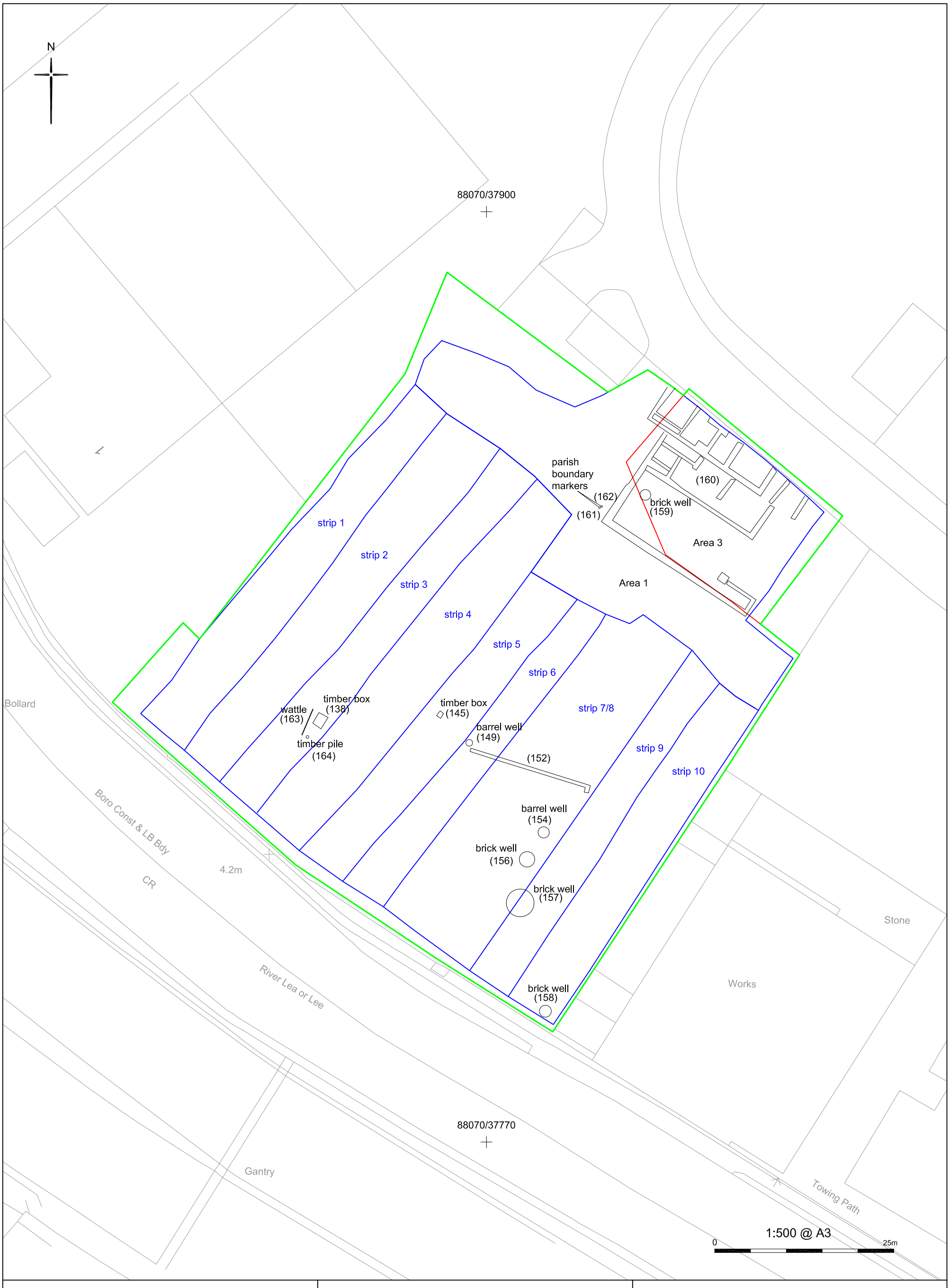


Fig 2: Plan of archaeological areas and features
Site code: XSK10
Figure type: Fieldwork report

Type of fieldwork:
General Watching Brief

Site Address:
Crossrail: C261 Excavation works for National Grid,
Pudding Mill Lane Portal,
London E15

- Trench edge
- (11) Archaeological features with context numbers
- Machine reduction strip
- Area 3 boundary

Fig 3 Drawing of boundary marker stone [161]

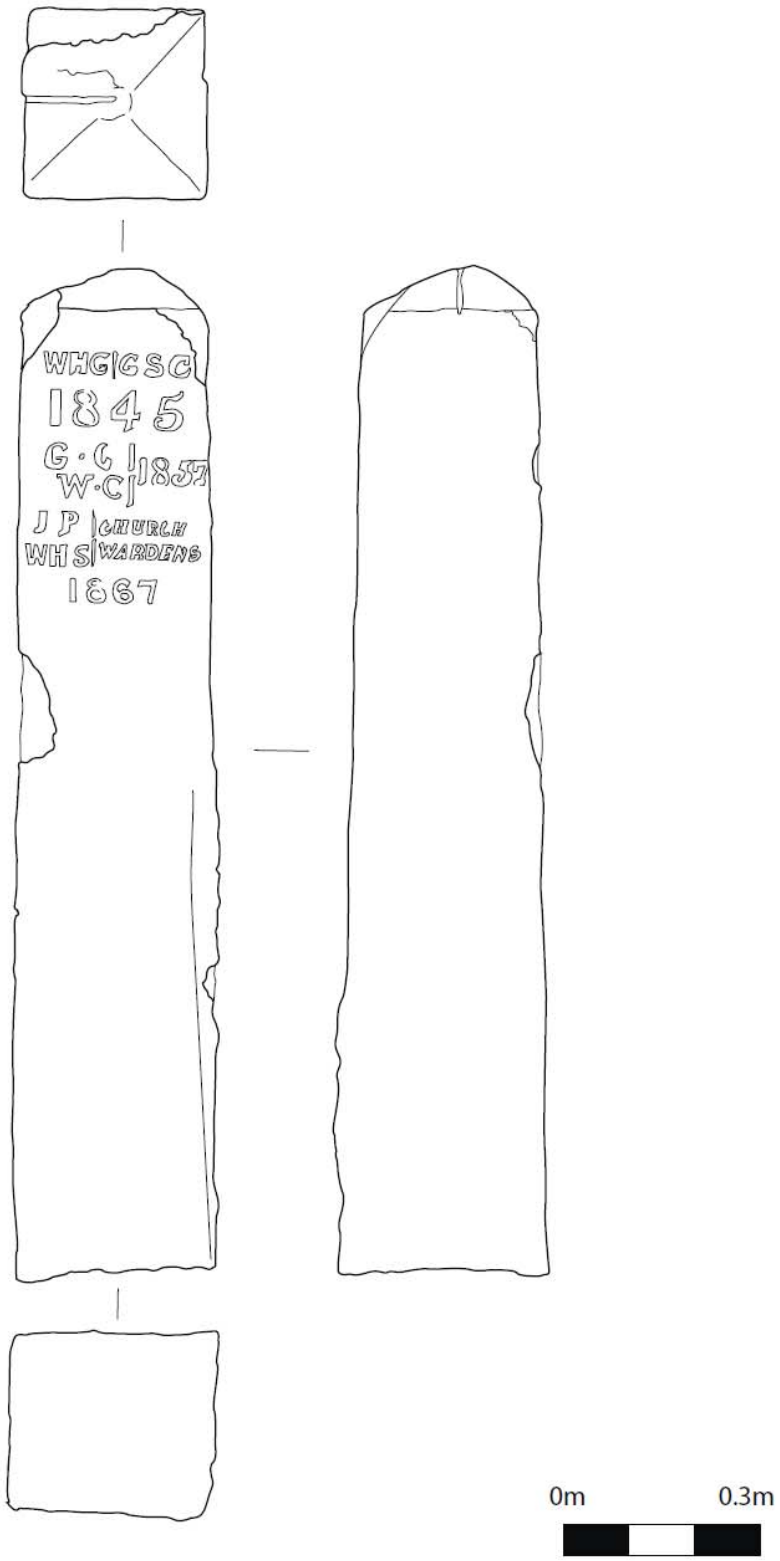
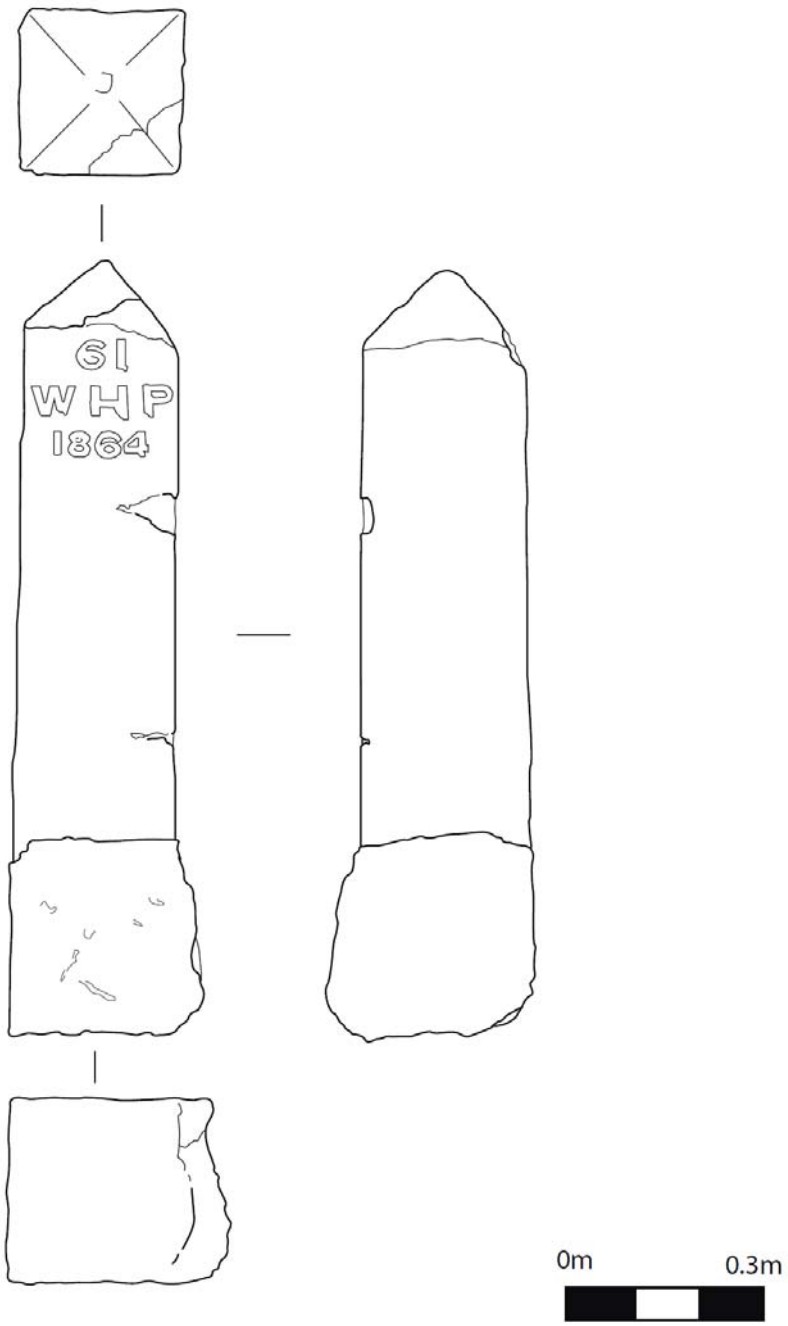


Fig 4 Drawing of boundary marker stone [162]



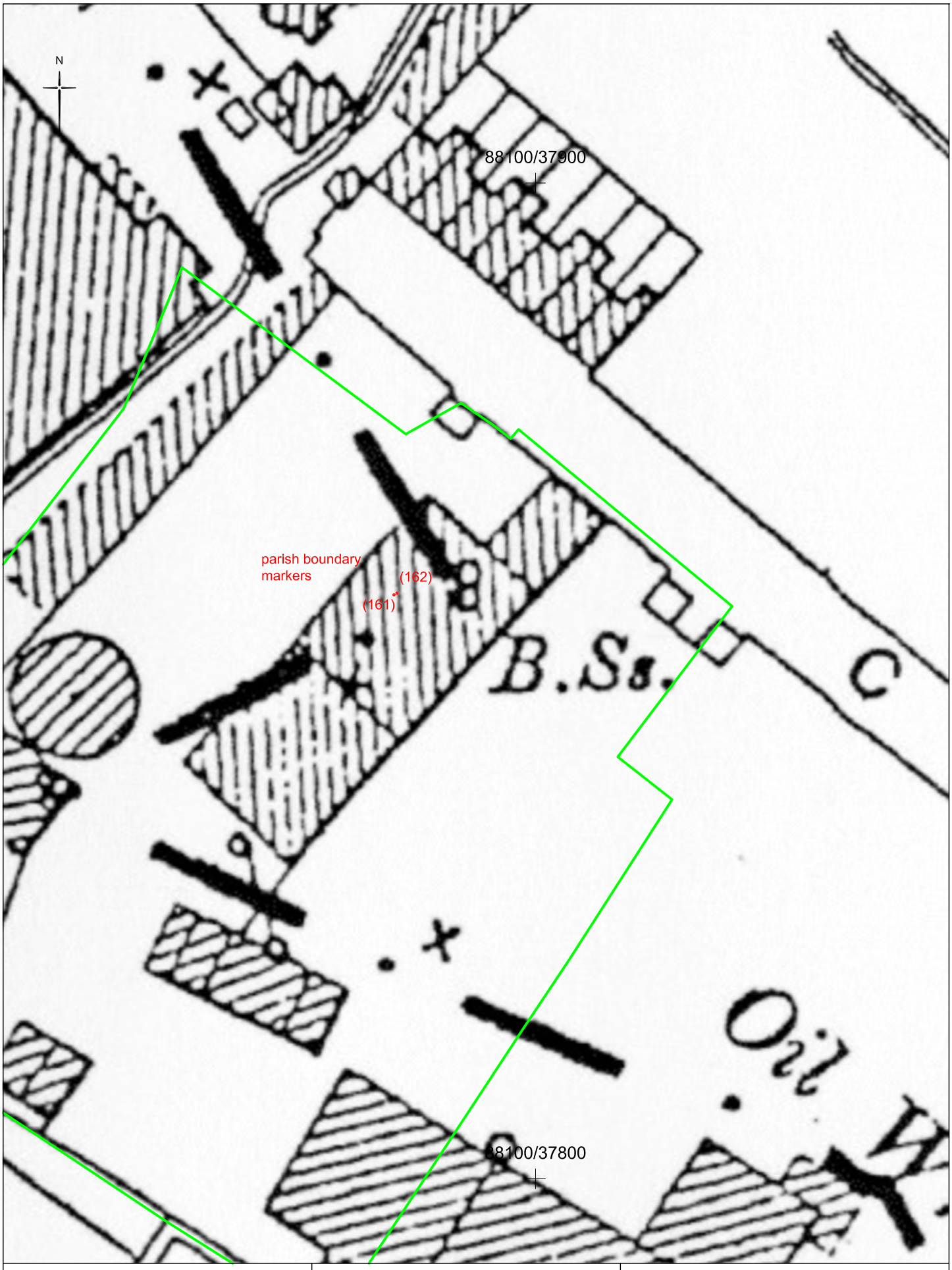


Fig 5: 1896 OS map with location of excavated parish boundary stones

Trench edge
Archaeological features

1:500 @ A4
0
25m

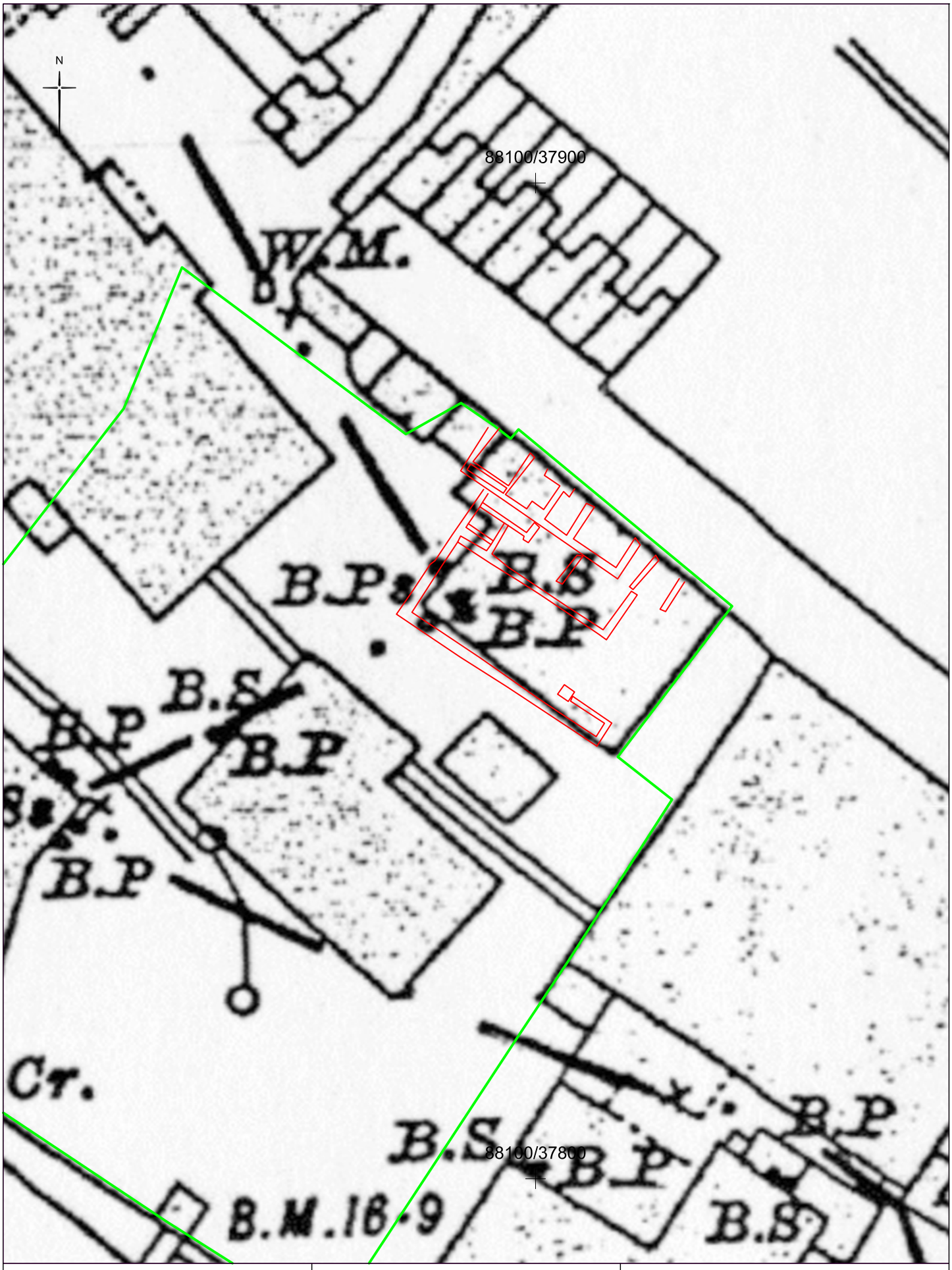


Fig 6: 1914 OS map with archaeological walls at north of site

Trench edge
Archaeological features

1:500 @ A4

0 25m

Fig 7 Edward Stanford's map of 1862

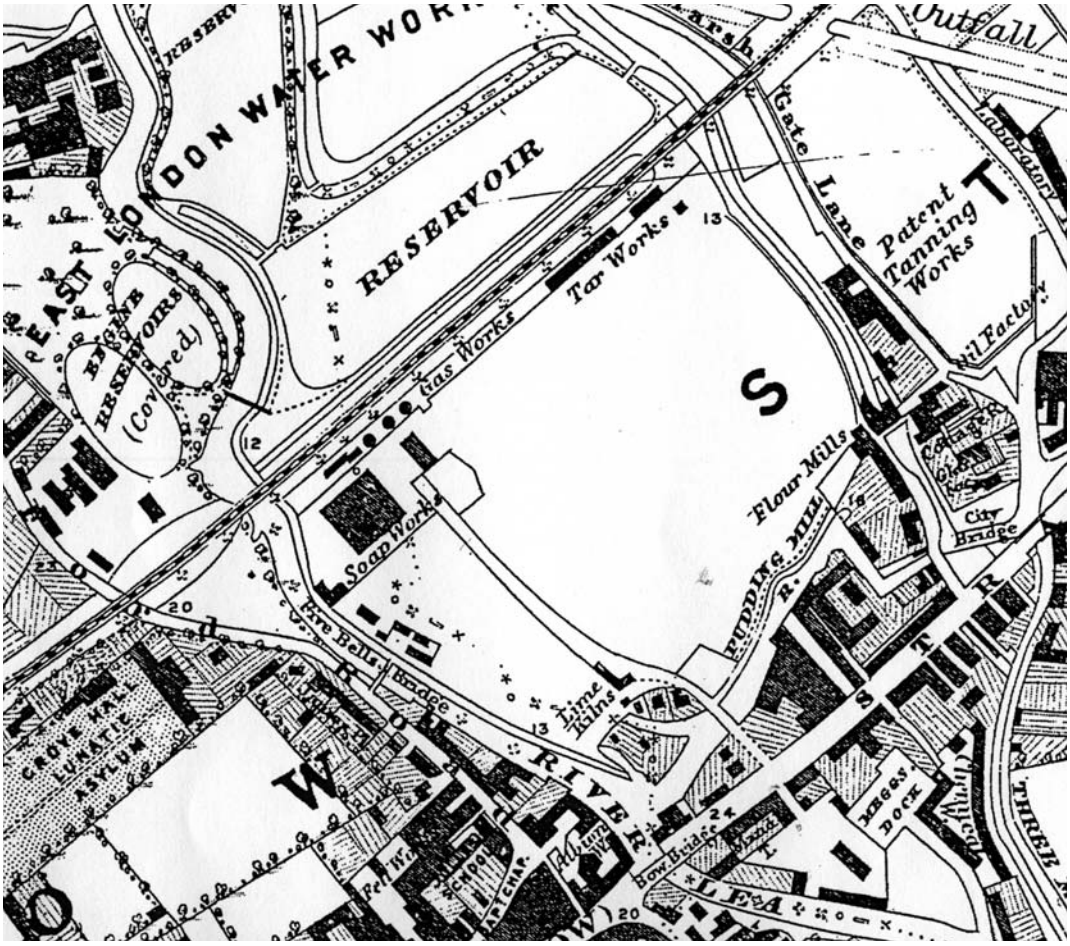


Photo 1 Showing excavation of strip 9 with exposed alluvium, looking north-east

Photo 2 Showing excavated timber box structure [138] that contained lead quart measure <7>, looking south-west

Photo 3 Lead quart measure <7>; body H 150mm, total H 154mm.)

Photo 4 Showing top of barrel well [149], looking south

Photo 5 Showing excavated pit containing Calcium Sulphate ('Leblancite') cut into exposed alluvium, looking south-west

Photo 6 Showing parish boundary marker stone [162], in situ, looking south-west

Photo 7 Showing building remains of [160], looking east

Photo 8 Showing 19th century brick well [159], looking west

18 Appendix 1: Worley Parsons for National Grid: Fieldwork Report, Archaeological Watching Brief on Ground Investigations Bulk Supply Point, Pudding Mill Lane

WorleyParsons for National Grid

Fieldwork Report

Archaeological Watching Brief

On Ground Investigations Bulk Supply Point, Pudding Mill Lane

Document Number:

Document History:

Revision:	Date:	Prepared by:	Checked by:	Approved by:	Reason for Issue:
1.0	10.11.14	Virgil Yendell (MOLA)	Isca Howell	Nicholas Elsden (MOLA)	For Client Review.
					

Non technical summary

This report presents the results of a general watching brief carried out by Museum of London Archaeology (MOLA) in the Bulk Supply Point, Pudding Mill Lane, Bow, E15 1PW, being constructed by National Grid as part of the Crossrail project, under the Crossrail Act (2008).

The report was commissioned from MOLA by commissioned by WorleyParsons Consulting on behalf of the client, National Grid as part of a wider programme to mitigate the archaeological implications of railway development proposals along the Crossrail route.

This report covers the monitoring of: three boreholes and seven trial pits all within the confines of the Bulk Supply Point, Pudding Mill Lane.

Natural geology in the form of Shepperton/Lea Valley Gravel was recorded across the site in the boreholes. The gravel surface was slightly lower in the western corner of the site. The very edge of the gravel island appears to have been located in north, possibly north-east, dropping off into lower lying channel areas. Low lying organic deposits were identified to the south, and an alder tree trunk was cored at the base of the sequence to the south-west of site, alongside the present course of the River Lea. There is a variable thickness of alluvium on site, but the degree to which these deposits were contaminated or disturbed/redeposited could not wholly be ascertained as part of the watching brief. A Victorian/Edwardian Staffordshire Blue brick surface (possibly related to the river wall construction) was located in the western corner of the site and a cobbled surface with narrow gauge railing lines running through it in an east to west orientation was recorded to the centre of the site, along with a buried storage tank. These are all likely to be related to the lampworks or soap works.

The watching brief has demonstrated that there is some evidence of lower lying marginal organic deposits adjacent to the previously identified gravel island to the east of the site. The gravel island may extend onto the north-east of the site, as indicated by the rising surface of the gravel. However, these deposits were not confirmed during the watching brief. The organic deposits could be contemporary with the Bronze Age activity previously located to the east of the site, and as such could provide a palaeoenvironmental record of the vegetation and hydrology of the immediate environment as well as any indirect evidence of the nearby human activity. Victorian to Edwardian remains of brick and cobbled surfaces, small gauge rail lines and storage tanks were recorded on site, and may relate to either the late 19th-century lampworks or the soap works.

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1 Introduction

Crossrail is a new Cross-London Rail Link project which will provide transport routes across the south-east of England and London. The route will link Maidenhead and Heathrow in the west with Shenfield in the north-east and Abbey Wood in the south-east. In central London, from Royal Oak in the west to Pudding Mill Lane and Royal Victoria Dock in the east, Crossrail will consist of a tunnelled section with seven new stations linked to the existing transport network.

The Bulk Supply Point, Pudding Mill Lane, Bow, E15 1PW (NGR 537670 183270) is being constructed by National Grid as part of the Crossrail project, under the Crossrail Act (2008). Geoarchaeological investigations (monitoring only) were carried out on this site by the Museum of London Archaeology (MOLA) as commissioned by WorleyParsons Consulting on behalf of the client, National Grid.

The National Grid Bulk Supply Point site is located within the London Borough Newham, south of the Great Eastern Main Line (GEML) railway embankment, east of the River Lea, and west of Cook's Road, about 1km south-west of Stratford Station.

This fieldwork report describes the results of a General Watching Brief (GWB) on ground investigation works:

Task	Principal Contractor	Dates of Fieldwork
• **GWB** on ground investigations for National Grid (3 boreholes and 9 test pits).	C305: Dragados Sisk (JV)	29/09/14 to 10/10/14

Table 1 Task information

All fieldwork was conducted between 29/10/14 and 10/10/14 and supervised by Virgil Yendell (MOLA Senior Geoarchaeologist).

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

The event code (sitecode) is PDN14.

2 Planning background

No Written Scheme of Investigation (WSI) specifically for the National Grid works has been produced at the time of these ground investigations. However, the Bulk Supply Point site lies within the overall Crossrail portal site at Pudding Mill Lane, and therefore the following WSI covers the overall regime within which this task will be conducted:

- A Crossrail **Site-specific Written Scheme of Investigation** (SS-WSI): *Package C152 Pudding Mill Lane Portal, Archaeology Site-specific Written Scheme of Investigation, Doc. No. C152-SWN-C2-RSI-CR094_PT002-0001 Version 10*, 12.05.10 (Crossrail 2010)

The overall framework within which archaeological work will be undertaken is set out in the Environmental Minimum Requirements (EMR) for Crossrail (Crossrail 2008). The requirements being progressed follow the principles of Planning Policy Guidance Note 16 (PPG16) (DoE 1990), and its replacements Planning Policy Statement 5 (PPS5) (DCLG 2010) and the National Policy Planning Framework (NPPF) (DCLG 2012), on archaeology and planning. 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 Act 2008 concern matters relating to archaeology and the built heritage, and allow the dis-application by Crossrail 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 disapplied their existing rights to the Cross Rail project, and Schedule 15 allows Crossrail to bypass any ecclesiastical or other existing legislation relating to burial grounds.

Notwithstanding these disapplications, 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 WorleyParsons Consulting on behalf of the client, National Grid. 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 archaeology of site

The principal previous Crossrail studies are as follows:

- Crossrail, *Environmental Statement*, February 2005;
- *Crossrail, Assessment of Archaeology Impacts, Technical Report. Part 4 of 6, South-East Route Section*, 1E0318-E2E00-00001, February 2005 [Specialist Technical Report (STR);
- Crossrail Site-specific Written Scheme of Investigation (SS-WSI): *Package C152 Pudding Mill Lane Portal, Archaeology Site-specific Written Scheme of Investigation, Doc. No. C152-SWN-C2-RSI-CR094_PT002-0001 Version 10*, 12.05.10

All fieldwork was carried out to a method statement prepared in line with the principal contractor's method statement. The above cited reports are all available from the London Archaeological Archive and research Centre (LAARC).

5 Geology and topography of site

The geological and topographical setting was covered in detail in the WSI (see section 4 above), and is summarised below.

Present ground levels across the Crossrail Pudding Mill Lane Portal site vary considerably due to railway and other construction, from *c* 101m to 105m ATD in the floodplain to the east of the River Lea, rising up to 104m to 110m ATD on the gravel terraces west of the Lea. The ground levels in the area of the National Grid Bulk Supply Point lie at *c* 104.2m ATD.

The site lies mainly on alluvium within the floodplain of the River Lea. The gravel topography underlying the site comprises intercutting braided channels with raised gravel areas between them. The geo-archaeological assessment identifies the Bulk Supply Point site as overlying the edge of one such island, with gravel terrace deposits expected at 101.2m–101.4m ATD. The assessment also identified peats and organic alluvial deposits site-wide, but concentrated in areas of lower gravel topography in the eastern and western parts of the site.

5.1 Archaeological and Historical Background

The archaeological and historic background was covered in detail in the WSI (see section 4 above), and is summarised below.

The geo-archaeological deposit model identifies the site as lying over the edge of a raised area of gravel (at *c* 101.2–101.4m ATD). Evidence for prehistoric activity has been recorded at other areas of raised gravel within the Lea Valley, and there is also potential for evidence of activity in marginal areas surrounding the gravel island. Immediately to the east of the National Grid Bulk Supply Point, features of Late Bronze Age–Early Iron Age date were observed cutting into a relict land surface at 101.67m ATD, with a later prehistoric land surface observed at 101.84m ATD (MoLAS-PCA 2008, Olympics Planning Delivery Zone 8: a report on the evaluation, unpublished MOL report).

As the river channels dried, a more stable marsh environment of wet woodland developed (MoLAS-PCA 2008) that was generally unattractive to human activity. From the early post-medieval period onwards the area exhibits some evidence for human activity, including pastoral use (Trench PDZ8.04/5.35(C)) despite evidence for flood events.

In the 19th and 20th centuries layers of re-deposited alluvium demonstrate the early ground raising that occurred prior to the landscaping that resulted in the topography of the site today (MoLAS-PCA 2008). In the mid–late 19th century the site lay between the East London Soap Works to the north and west and a Lampworks and Oil Wharf to the south. Elements of any of these may have extended to the current site. Historic mapping indicates the site was occupied by ancillary buildings likely associated with the Lampworks and a possible depot yard.

6 Research aims and objectives

6.1 Overall research aims

The original aims and objectives were listed in the WSI (Crossrail 2010) and stated that 'data collected from archaeological investigation and mitigation may contribute to the following research themes':

- Understanding London's hydrology, river systems and tributaries and the relationship between rivers and floodplains;
- Understanding the relationship between landscape, river and settlement;
- Using the understanding that comes from reconstructing London's past to contribute to wider environmental studies about contemporary concerns such as: climate change; sea level fluctuations; flood defence initiatives; links between pollution, health and quality of life;
- Understanding the reasons for evolution of the road systems, street layouts, river crossings and ferries, and their importance as engines of development and change;
- Understanding the nature and meaning of the deposition of metalwork in the Thames and at the headwaters of river tributaries;
- Understanding how water supply and drainage provision were installed and managed;
- Studying the correlation between sites associated with watercourses and meander bends, so as to understand the origin of settlements; and
- Understanding the evolving character of development in central London, in comparison to other riverine settlements.

Any evidence for Post-medieval industrial activity will contribute to the following themes:

- Charting how and why different parts of London developed as specialist producers, and understanding the implications of this for London as a world city;
- Establishing how daily work and life in London reflected and contributed to the rise of London as the commercial centre of the British Empire, and to its continued eminence as a world city thereafter; and
- Examining the success with which small towns in the London region adapted to the capital's growth.

6.2 Objectives of the fieldwork

The following task-specific research questions have been devised by MOLA for this work:

1. Are any **prehistoric land surfaces** identified? If prehistoric land surfaces are present, are they contemporary with surfaces previously identified at Pudding Mill Lane (MoLAS-PCA 2008, Trench PDZ8.04/5.35(C))?
2. Can information about the location and extent of the **gravel island** identified during previous investigations and boreholes in the area of Pudding Mill Lane be

refined?

3. Is there evidence for the formation of **peat** in marginal areas?
4. Within any **later** alluvial deposits, is it possible to identify evidence for **anthropogenic management** of the increasingly wet and marshy landscape?
5. What is the extent and survival of post-medieval remains, particularly of the buildings associated with the Lampworks?

7 Methodology of site-based and off-site work

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

- Crossrail, 2009a *Archaeology Generic Written Scheme of Investigation*, Doc No. CR-PN-LWS-EN-SY-00009
- Museum of London *Archaeological Site Manual* (MoL 1994)
- *English Heritage Greater London Archaeology Advisory Service: Standards for Archaeological Work*, London Region, English Heritage, February 2014
- The site finds and records can be found under the site code PDN14 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 Site-specific general watching brief methodology

The MOLA geoarchaeologist monitored the drilling of 3 geotechnical boreholes, and the mechanical excavation of 7 of the 9 test pits (with the area of TP A and TP E being inaccessible and not dug) by the GI Contractor (Figure 2).

Monitoring of geotechnical works by the MOLA geoarchaeologist took place at ground level. The deep unshored test pits were not entered. Recording of the test pits included basic notes, such as size and depth of the pit and levels of archaeological strata or significant features and a general photographic record was be undertaken with minimal disruption to The Ground Investigations Contractor's work schedule.

The MOLA geoarchaeologist kept an adequate distance during the sinking of boreholes by the GI Contractor. Approach to the coring rig was made to inspect and where necessary, record the borehole sample using basic field notes and photographic record. This was undertaken with minimal disruption to the Ground Investigations Contractor's work schedule.

8 Results and observations including stratigraphic report and quantitative report

8.1 Trial pit TP B

Photo 1 Trial Pit TP B, looking east.

TP B		
LSG grid coordinates	537659.2	183281.46
OS National grid coordinates	88049.549	37848.828
Dimensions	0.3m wide	
Modern ground level/top of slab (m ATD)	104.444	
Modern ground level/top of slab (m OD)	4.444	
Base of modern fill/slab (m ATD)	103.84	
Base of archaeological deposits seen	103.04	
Base of deposits observed and/or base of intervention (m ATD)	101.84	
Surface of Holocene natural observed (m ATD)	103.04	
Surface of Pleistocene or older natural observed (m ATD)	102.04	

Depth below ground level		**Elevation (m ATD)**		**Description**	**Interpretation**
0	0.6	104.44	103.84	Brown loam with yellow and red brick	Victorian/Edwardian to modern made ground
0.6	0.7	103.84	103.74	11cm sq cobbles forming surface, narrow 0.5m gauge rail lines running through it E-W orientation.	Victorian/Edwardian surface
0.7	1.4	103.74	103.04	Compact/firm ash fill	Victorian/Edwardian made ground
1.4	2.4	103.04	102.04	Firm to stiff dark green grey clay	Holocene Alluvium
2.4	2.6	102.04	101.84	Greenish grey clay sandy gravel, rounded	Pleistocene gravel

8.2 Trial pit TP C

Photo 2, Trial Pit TP C, looking south.

TP C		
LSG grid coordinates	537673.86	183290.18
OS National grid coordinates	88064.403	37857.694
Dimensions	2x0.5m	
Modern ground level/top of slab (m ATD)	104.443	
Modern ground level/top of slab (m OD)	4.443	
Base of modern fill/slab (m ATD)	104.34	
Base of archaeological deposits seen	103.74	
Base of deposits observed and/or base of intervention (m ATD)	101.44	
Surface of Holocene natural observed (m ATD)	103.74	

Surface of Pleistocene or older natural observed (m ATD)		n/a			
Depth below ground level		**Elevation (m ATD)**		**Description**	**Interpretation**
0	0.1	104.44	104.34	concrete	Modern
0.1	0.2	104.34	104.24	Yellow/red brick rubble, in brownish grey loam	Victorian/Edwardian to modern made ground
0.2	0.5	104.24	103.94	Black ashy fill, gravelly, frequent yellow brick	Victorian/Edwardian made ground
0.5	0.7	103.94	103.74	Dark yellow brown coarse sand and gravel, rounded, matrix supported, deposit deepens to north.	
0.7	3	103.74	101.44	Mid blue grey clay silt, mottled brown, heavily contaminated, manganese staining, no visible organics	Holocene alluvium

8.3 Trial pit TP D

Photo 3, Trial Pit TP D, looking south west.

TP D		
LSG grid coordinates	537686.13	183281.51
OS National grid coordinates	88049.549	37848.828
Dimensions	0.3m wide	
Modern ground level/top of slab (m ATD)	104.584	
Modern ground level/top of slab (m OD)	4.584	
Base of modern fill/slab (m ATD)	104.38	
Base of archaeological deposits seen	102.38	
Base of deposits observed and/or base of intervention (m ATD)	n/a	
Surface of Holocene natural observed (m ATD)	n/a	

Surface of Pleistocene or older natural observed (m ATD)				n/a	
Depth below ground level		**Elevation (m ATD)**		**Description**	**Interpretation**
0	0.2	104.58	104.38	Concrete	Modern
0.2	0.4	104.38	104.18	Light grey brown loam, frequent yellow and red brick	Victorian/Edwardian to modern made ground
0.4	0.9	104.18	103.68	Black ash fill, gravelly	Victorian/Edwardian made ground
0.9	2.1	103.68	102.48	Dark blue clay with green liquid contamination	Holocene alluvium possibly redeposited
2.1	2.2	102.48	102.38	Chalk rich layer	Possible chalk lining to man made feature

8.4 Trial pit TP F

Photo 4 Trial Pit TP F, looking north.

TP F					
LSG grid coordinates				537696.49	183246.39
OS National grid coordinates				88049.549	37848.828
Dimensions				0.3m wide	
Modern ground level/top of slab (m ATD)				104.604	
Modern ground level/top of slab (m OD)				4.604	
Base of modern fill/slab (m ATD)				104.40	
Base of archaeological deposits seen				103.50	
Base of deposits observed and/or base of intervention (m ATD)				101.70	
Surface of Holocene natural observed (m ATD)				103.50	
Surface of Pleistocene or older natural observed (m ATD)				n/a	
Depth below ground level		**Elevation (m ATD)**		**Description**	**Interpretation**
0	0.1	104.60	104.50	Gravel hard core pale grey to white	Modern made ground

0.1	0.2	104.50	104.40	Yellow brown loamy modern made ground	
0.2	1.1	104.40	103.50	Ash fill black with red/yellow brick, concrete to south end of TP extending from 0.2 to 0.5m bgl (below ground level)	Victorian/Edwardian made ground
1.1	2	103.50	102.60	Black to bluish silty clay, contaminated smell	Holocene alluvium
2	2.9	102.60	101.70	Blue grey soft silty clay, only slight contamination smell, relatively natural looking, rare rootlet, occasional fragments of small mollusc shell	

8.5 Trial pit TP G

Photo 5 Trial Pit TP G, looking west.

TP G					
LSG grid coordinates				537693.35	183235.04
OS National grid coordinates				88049.549	37848.828
Dimensions				0.3m wide	
Modern ground level/top of slab (m ATD)				104.528	
Modern ground level/top of slab (m OD)				4.528	
Base of modern fill/slab (m ATD)				104.23	
Base of archaeological deposits seen				103.13	
Base of deposits observed and/or base of intervention (m ATD)				103.13	
Surface of Holocene natural observed (m ATD)				n/a	
Surface of Pleistocene or older natural observed (m ATD)				n/a	
Depth below ground level		**Elevation (m ATD)**		**Description**	**Interpretation**
0	0.3	104.53	104.23	Concrete	Modern made ground

0.3	1.4	104.23	103.13	Dark brown to black ashy clinker fill, frequent red/yellow brick. At 1.1m bgl north south aligned oil filled metal pipe, at 1.2m bgl yellow brick foundation to SW, metal tank to NE connected to pipe and green liquid filled	Victorian/Edwardian to modern made ground

8.6 Trial pit TP H

Photo 6 Trial Pit TP H, looking north.

TP H					
LSG grid coordinates				537647.11	183261.86
OS National grid coordinates				88049.549	37848.828
Dimensions				0.3m wide	
Modern ground level/top of slab (m ATD)				104.609	
Modern ground level/top of slab (m OD)				4.609	
Base of modern fill/slab (m ATD)				103.31	
Base of archaeological deposits seen				103.81	
Base of deposits observed and/or base of intervention (m ATD)				103.61	
Surface of Holocene natural observed (m ATD)				103.81	
Surface of Pleistocene or older natural observed (m ATD)				n/a	
Depth below ground level		**Elevation (m ATD)**		**Description**	**Interpretation**
0	0.3	104.61	104.31	Concrete	Modern

0.3	0.8	104.31	103.81	Ash rubble fill, occasional large timber	Victorian/Edwardian to modern made ground
0.8	1	103.81	103.61	Blue black clay and green liquid (hole terminated)	Possible Holocene alluvium

8.7 Trial pit TP I

Photo 7 Trial Pit TP I, looking south.

TP I			
LSG grid coordinates		537650.66	183245.63
OS National grid coordinates		88049.549	37848.828
Dimensions		0.3m wide	
Modern ground level/top of slab (m ATD)		104.649	
Modern ground level/top of slab (m OD)		4.649	
Base of modern fill/slab (m ATD)		104.10	
Base of archaeological deposits seen		101.95	
Base of deposits observed and/or base of intervention (m ATD)		101.65	
Surface of Holocene natural observed (m ATD)		101.95	
Surface of Pleistocene or older natural observed (m ATD)		n/a	
Depth below ground level	**Elevation (m ATD)**	**Description**	**Interpretation**

0	0.55	104.65	104.10	Concrete over brown loamy fill	Modern Made ground
0.55	0.6	104.10	104.05	Brick surface, one layer thick, Edwardian/Victorian Staffordshire blue pavement brick	Victorian/Edwardian brick surface
0.6	1	104.05	103.65	Grey brown loam occasional brick	Victorian/Edwardian made ground
1	2.7	103.65	101.95	Dark blue grey clay, occasional brick orange/red, stiff, rounded pebbles, oyster shells, London Clay lining for river wall? Or bed sediments dredged and back filled behind wall during construction, slight contamination odour, rare twig/branch, peaty smell with depth	Redeposited natural possibly part of the construction of the Victorian/Edwardian river wall
2.7	3	101.95	101.65	Clayey sandy gravel, rounded, dark green grey	As above possibly entering Holocene natural deposits

8.8 Borehole BH A

Photo 8 Borehole BH A sediment retrieved.

BH A2			
LSG grid coordinates		537673.86	183290.18
OS National grid coordinates		88049.549	37848.828
Dimensions		0.3m wide	
Modern ground level/top of slab (m ATD)		104.443	
Modern ground level/top of slab (m OD)		4.443	
Base of modern fill/slab (m ATD)		104.34	
Base of archaeological deposits seen		103.74	
Base of deposits observed and/or base of intervention (m ATD)		95.94	
Surface of Holocene natural observed (m ATD)		103.74	
Surface of Pleistocene or older natural observed (m ATD)		100.24	
Depth below ground level	**Elevation (m ATD)**	**Description**	**Interpretation**

0	0.1	104.44	104.34	concrete	Modern
0.1	0.2	104.34	104.24	Yellow/red brick rubble, in brownish grey loam	Victorian/Edwardian to modern made ground
0.2	0.5	104.24	103.94	Black ashy fill, gravelly, frequent yellow brick	Victorian/Edwardian made ground
0.5	0.7	103.94	103.74	Dark yellow brown coarse sand and gravel, rounded, matric supported, deposit deepens to north.	
0.7	3	103.74	101.44	Mid blue grey clay silt, mottled brown, heavily contaminated, manganese staining, no visible organics	Holocene alluvium
3	3.8	101.44	100.64	Grey mid to pale fine silty sand, abundant mollusc fragments, almost clast supported	Early Holocene fining up/fluvial
3.8	4.2	100.64	100.24	As above but becoming less sandy	
4.2	4.4	100.24	100.04	Small to Medium gravel sub angular to sub rounded/rounded respectively, in fine sand matrix, grey	Pleistocene gravels
4.4	8.1	100.04	96.34	Gravels poorly sorted, rounded/sub angular	

8.1	8.5	96.34	95.94	stiff grey clay	London Clay

8.9 Borehole BH B

Photo 9 Borehole BH B sediment retrieved.

BH B			
LSG grid coordinates		537644.08	183253.88
OS National grid coordinates		88033.726	37822.152
Dimensions		0.3m wide	
Modern ground level/top of slab (m ATD)		104.658	
Modern ground level/top of slab (m OD)		4.658	
Base of modern fill/slab (m ATD)		104.36	
Base of archaeological deposits seen		101.26	
Base of deposits observed and/or base of intervention (m ATD)		97.66	
Surface of Holocene natural observed (m ATD)		101.26	
Surface of Pleistocene or older natural observed (m ATD)		99.56	
Depth below ground level	**Elevation (m ATD)**	**Description**	**Interpretation**

0	0.3	104.66	104.36	Concrete	Modern
0.3	1.4	104.36	103.26	Loamy brown fill, ashy, occasional whole yellow brick becoming clayey and rooty to base	Victorian/Edwardian to modern made ground
1.4	3.4	103.26	101.26	Blue grey clay, firm to soft, becoming soft to base, occasional Mn staining	Holocene alluvium to redeposited material used in construction of the Victorian/Edwardian river wall
3.4	3.8	101.26	100.86	Grey sandy silt frequent mollusc fragments, occasional 1cm root soft, rare organic fragments	Holocene fluvial to redeposited material used in construction of the Victorian/Edwardian river wall
3.8	4	100.86	100.66	Medium grey sand, sub rounded to rounded gravel, matrix supported	
4	4.2	100.66	100.46	Coarse sand, small to medium sub angular to sub rounded gravel, poorly sorted, clast supported grey	
4.2	4.4	100.46	100.26	Coarse sand small gravel, clast supported, grey	

4.4	4.6	100.26	100.06	Medium sub angular gravel, clast supported fine sand, grey	
4.6	5.1	100.06	99.56	Tree trunk/wood, alder, very knotty	Part of an inundated submerged tree eroded in the Holocene river or later wooden structure
5.1	5.4	99.56	99.26	Fine to medium grey sand, occasional mollusc fragments, firm to soft	Pleistocene outwash to Holocene fluvial
5.4	7	99.26	97.66	stiff grey clay	London Clay

8.10 Borehole BH C

Photo 10 Borehole BH C sediment retrieved.

BH C					
LSG grid coordinates				537686.33	183225.4
OS National grid coordinates				88075.254	37792.62
Dimensions				0.3m wide	
Modern ground level/top of slab (m ATD)				104.796	
Modern ground level/top of slab (m OD)				4.796	
Base of modern fill/slab (m ATD)				104.50	
Base of archaeological deposits seen				102.05	
Base of deposits observed and/or base of intervention (m ATD)				97.80	
Surface of Holocene natural observed (m ATD)				102.05	
Surface of Pleistocene or older natural observed (m ATD)				98.40	
Depth below ground level		**Elevation (m ATD)**		**Description**	**Interpretation**
1	0.3	103.80	104.50	Concrete	Modern

0.3	1.4	104.50	103.40	Black to dark brown grey, pieces of yellow brick, ashy, very pungent contamination smell	Victorian/Edwardian to modern made ground
1.4	2.75	103.40	102.05	Greenish grey silty clay, firm, Mn staining, occasional brick piece, large rounded cobble, contaminated smell, in situ or redeposited?	Holocene alluvium to disturbed/redeposited material
2.75	2.93	102.05	101.87	Brownish grey silty clay, organic flecks, rooting	Holocene alluvium/wetland deposits
2.93	3.2	101.87	101.60	Light blue grey silty clay, softer, more plastic, rare/occasional Mn	
3.2	4.2	101.60	100.60	Firm organic silt, grey brown, rare fibres, homogenous, 1 cm root	
4.2	6.4	100.60	98.40	Coarse sand, fine to medium gravel grey, 5cm pieces of wood to base	Late Glacial to Holocene fluvial with eroded organics or rooting
6.4	7	98.40	97.80	stiff grey clay	London Clay

9 Assessment of results against original research aims

The draft revised GLAAS guidelines (English Heritage 2014) require an Assessment of results against original expectations (these no longer mention the criteria for assessing national importance).

9.1 Original research aims

The original fieldwork objectives were met as follows:

1. *Are any* **prehistoric *land surfaces*** *identified? If* prehistoric *land surfaces are present, are they contemporary with surfaces previously identified at Pudding Mill Lane (MoLAS-PCA 2008, Trench PDZ8.04/5.35(C))?*

The gravel surface ranges from *c* 100m ATD to 99.5m ATD being slightly lower in the western corner of the site. Low lying organic remains were identified in gravels and sands to the base of BH C, and an alder tree trunk was cored at the base of BH B, possibly denoting stabilisation and land surface development. They may have been present in BH A, but were not identified due to heavy contamination. The geo-archaeological deposit model correctly identified the site as lying over the edge of a raised area of gravel (at *c* 101.2–101.4m ATD). Although these levels were not identified on site they would likely have been present to the north-east of the site, where no interventions were dug to the depths required to uncover the gravels. Evidence for prehistoric activity has been recorded at other areas of raised gravel within the Lea Valley, and there is also potential for evidence of activity in marginal areas surrounding the gravel island and in the west of the site. Immediately to the east of the National Grid Bulk Supply Point, features of Late Bronze Age–Early Iron Age date were observed cutting into a relict land surface at 101.67m ATD, with a later prehistoric land surface observed at 101.84m ATD (MoLAS-PCA 2008, Olympics Planning Delivery Zone 8: a report on the evaluation, unpublished MOL report). The elevation of this Bronze Age activity recorded in the gravels still *c* 1.5m higher than the gravels recorded on site as part pf these works. However, as already mentioned these levels could exist on the relatively unexplored eastern half of the site.

2. *Can information about the location and extent of the* ***gravel island*** *identified during previous investigations and boreholes in the area of Pudding Mill Lane be refined?*

The very edge of the gravel island appears to have been located in BH A and BH C with BH B dropping off into lower lying channel areas. Although the levels associated previously with the gravel island (*c* 101.2–101.4m ATD) were not identified on site they would likely have been present to the north-east of the site where no interventions were dug to the required depth.

3. *Is there evidence for the formation of* ***peat*** *in marginal areas?*

Organic deposits were identified to the base of BH C (100.6m ATD) and an alder tree trunk was cored at the base of BH B (100.06m ATD), both along the southern edge of the site alongside the present course of the River Lea.

4. *Within any **later** alluvial deposits, is it possible to identify evidence for **anthropogenic management** of the increasingly wet and marshy landscape?*

No Prehistoric, Roman or Medieval anthropogenic management was recorded during the monitoring of the boreholes or trial pits. There is variable 0.5 to 3m thickness of alluvium on site, but the degree to which these deposits were contaminated or disturbed/redeposited could not wholly be ascertained as part of the watching brief.

Thick alluvial deposits were identified in BH A to the north-west of the site but those in BH B and BH C appeared less contaminated. A piece of wood was record in BH B and may be part of a collapsed structure related to water management or access. However, no evidence of wood working was visible from the cored sample and the piece is more than likely to be wholly natural.

Evidence of Victorian/Edwardian ground raising and river wall construction could be implied from the lower made ground deposits across much of the site and especially in TP I containing the brick surface possibly related to the river wall construction itself.

5. *What is the extent and survival of post-medieval remains, particularly of the buildings associated with the Lampworks?*

TP I contained a Victorian/Edwardian Staffordshire Blue brick surface possibly related to the river wall construction itself. TP B contained a cobbled surface with narrow gauge rail lines running through it in an east to west orientation. The corner of a storage tank was uncovered in TP G. All of these features could be related to the lampworks or soap works.

10 Statement of potential archaeology

The watching brief has **demonstrated the potential survival** of lower lying marginal organic deposits adjacent to the previously identified gravel island to the east of the site. The gravel island may extend onto the north-east of the site, as indicated by the rising surface of the gravel. However, these deposits were not confirmed during the watching brief as no interventions went deep enough in this area. The organic deposits could be contemporary with the Bronze Age activity previously located to the east of the site, and as such could provide a palaeoenvironmental record of the vegetation and hydrology of the immediate environment, as well as any indirect evidence of the nearby human activity. Additional avenues of data such as these could greatly compliment what is already known about the adjacent Bronze Age activity. Victorian to Edwardian remains of brick and cobbled surfaces, small gauge rail lines and storage tanks were recorded on site and may relate to either the late 19th-century lampworks or the soap works.

10.1 Importance of Resources

The importance of the excavated remains has been assessed using professional judgement (including consulting MOLA's buildings specialists), informed, where applicable, by the criteria for assessing the national importance of monuments (DCMS 2010, Annex 1)

Organic deposits over lower lying gravels in the west/south west of the site are confirmed and if areas exist that are not contaminated by Victorian/Edwardian industry (such as around BH B in the very south west corner of the site) then these could be considered of **low importance**. However, the possibility of gravel deposits at the elevation of the previously identified gravel island existing in the north-east of the site is relatively good, potentially of a **low to moderate importance** and may record remains of human activity. The possible remains of the Victorian/Edwardian lampworks and soap works are of common and of widespread construction methods and materials. They are therefore assessed as being of **low importance**.

11 Conclusions

11.1 Geology

Natural geology in the form of Shepperton/Lea Valley gravel was recorded across the site in the boreholes. The gravel surface ranged from *c* 100m ATD to 99.5m ATD being slightly lower in the western corner of the site. The very edge of the gravel island appears to have been located in BH A and BH C with BH B dropping off into lower lying channel areas. Low lying organic deposits were identified to the base of BH C (100.6m ATD) and an alder tree trunk was cored at the base of BH B (100.06m ATD), both along the southern edge of the site alongside the present course of the River Lea. There is variable 0.5 to 3m thickness of alluvium on site, but the degree to which these deposits were contaminated or disturbed/redeposited could not wholly be ascertained as part of the watching brief.

11.2 Prehistoric remains

No remains from this period were conclusively identified but it is likely that any soil formation within the gravels, the lower organic deposits and the alder tree trunk are possibly of a prehistoric date.

11.3 Roman and medieval remains

No remains from these periods were conclusively identified, but it is likely that the alluvium recorded on site falls within these periods.

11.4 Post-medieval remains

A Victorian/Edwardian Staffordshire Blue brick surface possibly related to the river wall construction was located in the western corner of the site and a cobbled surface with narrow gauge rail lines running through it in an east to west orientation was recorded to the centre of the site along with a buried storage tank. These are all likely to be related to the 19th-century lampworks or soap works.

12 Publication and dissemination proposals

The Watching Brief results will initially be disseminated via this report and the supporting site archive of finds and records (including digital data).

13 Bibliography

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The watching brief was supervised by the author Virgil Yendell (Senior Geoarchaeologist), with specialist input from Ian Betts (building materials), and Karen Stewart (archaeo-botany). The fieldwork was managed by MOLA Assistant Contracts Manager Nicholas Elsden.

14.1 OASIS ID: molas1-194471

Project details

Project name	WorleyParsons for National Grid Fieldwork Report Archaeological Watching Brief Bulk Supply Point, Pudding Mill Lane
Short description of the project	This report covers the monitoring of: three boreholes and seven trial pits all within the confines of the Bulk Supply Point, Pudding Mill Lane. The watching brief was carried out under Crossrail contract C261 Archaeology Early East. Natural geology in the form of Shepperton/Lea Valley Gravel was recorded across the site in the boreholes. The gravel surface ranged was slightly lower in the western corner of the site. The very edge of the gravel island appears to have been located in north possibly north-east dropping off into lower lying channel areas. Low lying organic deposits were identified to the south and an alder tree trunk was cored at the base of the sequence to the south west of site alongside the present course of the River Lea. There is a variable thickness of alluvium on site but the degree to which these deposits were contaminated or disturbed/redeposited could not wholly be ascertained as part of the watching brief. A Victorian/Edwardian Staffordshire Blue brick surface possibly related to the river wall construction was located in the western corner of the site and a cobbled surface with narrow gauge railing lines running through it in an east to west orientation was recorded to the centre of the site along with a buried storage tank. These are all likely to be related to the lampworks or soap works.
Project dates	Start: 29-09-2014 End: 10-10-2014
Previous/future work	No / Not known
Any associated project reference codes	PDN14 - Sitecode
Type of project	Field evaluation
Site status	None
Current Land use	Industry and Commerce 4 - Storage and warehousing
Monument type	ISLAND Bronze Age

Project location

Country	England
Site location	GREATER LONDON NEWHAM NEWHAM Bulk Supply Point, Pudding Mill Lane
Postcode	E15
Study area	10000.00 Square metres
Site coordinates	TQ 537670 183270 50.9432746885 0.189015659551 50 56 35 N 000 11 20 E Point
Height OD / Depth	Min: -4.00m Max: 4.50m

Project creators

Name of Organisation	MOLA
Project brief originator	National Grid
Project design originator	MOLA
Project director/manager	Nicholas Elsden
Project supervisor	Virgil Yendell
Type of sponsor/funding body	National Grid
Name of sponsor/funding body	Nation Grid

Project archives

Physical Archive Exists?	No
Physical Archive recipient	LAARC
Digital Archive recipient	LAARC

Digital Media available	''Database'','GIS''
Paper Archive recipient	LAARC
Paper Media available	''Notebook - Excavation',' Research',' General Notes''

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	WorleyParsons for National Grid Fieldwork Report Archaeological Watching Brief On Ground Investigations Bulk Supply Point, Pudding Mill Lane
Author(s)/Editor(s)	Virgil Yendell
Date	2014
Issuer or publisher	MOLA
Place of issue or publication	London
Description	Ring bound client report

Entered by	Virgil Yendell (vyendell@mola.org.uk)
Entered on	7 November 2014

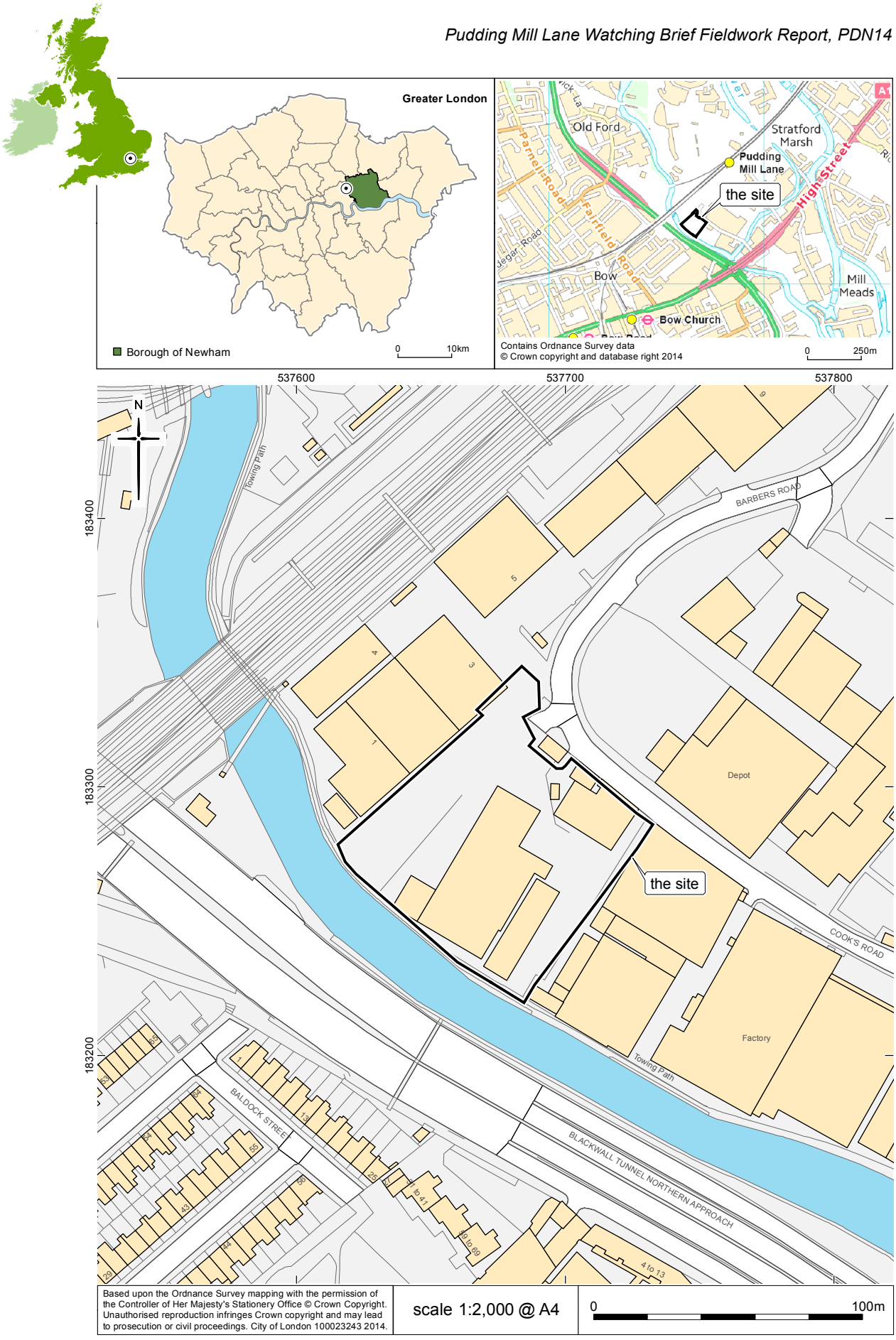

Fig 1 Site location

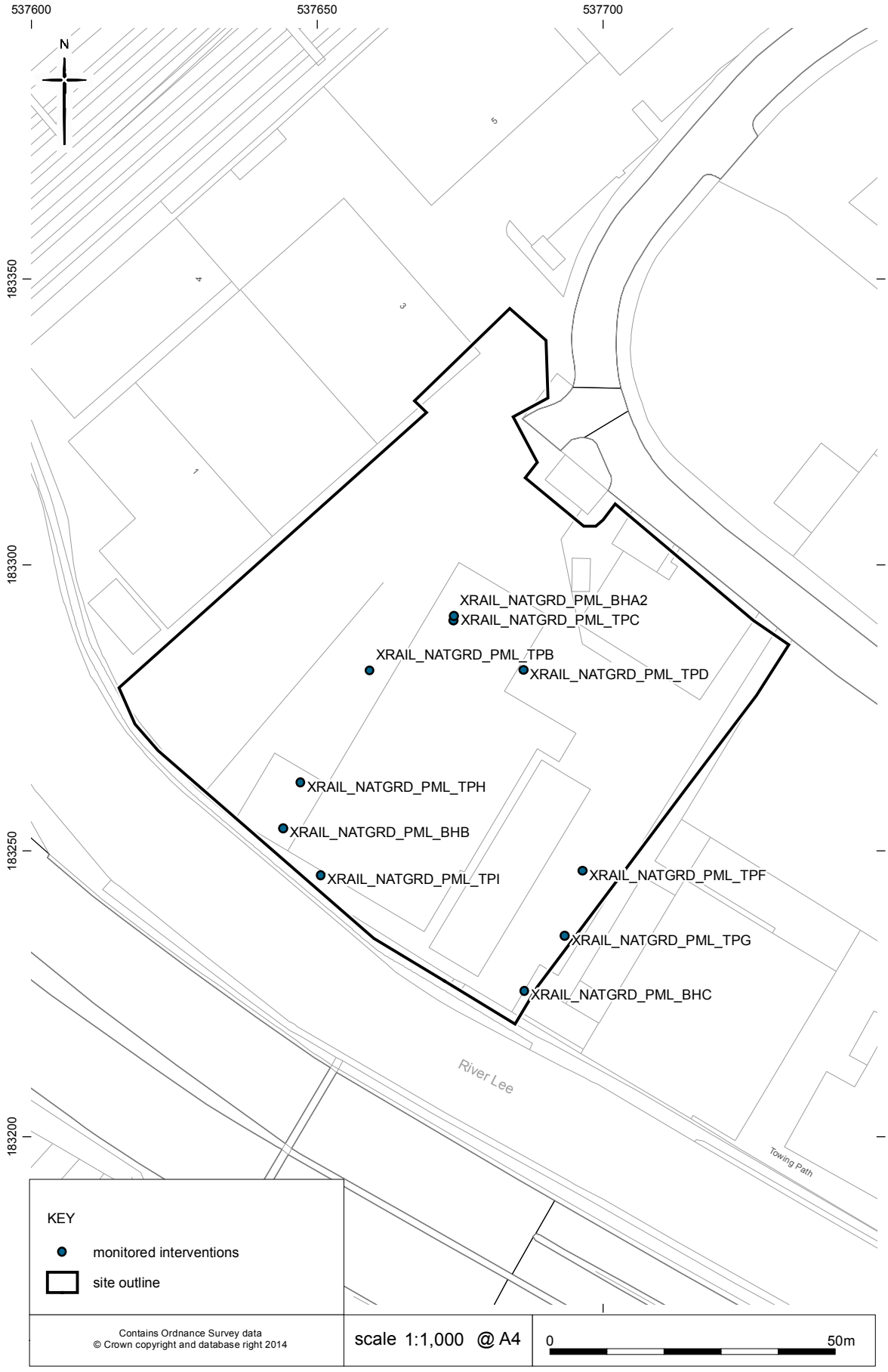

Fig 2 Location of interventions