PLANNING DELIVERY ZONE 4
Work Package 1
Trenches PDZ4.16
PDZ4.17
PDZ4.21
Work Package 5
Trench PDZ4.41

E15

London Borough of Tower Hamlets

An archaeological evaluation report

August 2008

REGISTERED IFA ORGANISATION

MUSEUM OF LONDON Archaeology Service

PRE-CONSTRUCT ARCHAEOLOGY

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Site Code: OL-06807 & OL-08207
National Grid Reference: 537400 184570

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Summary (non-technical)

This report presents the results of an archaeological evaluation carried out by the Museum of London Archaeology Service and Pre-Construct Archaeology (MoLAS-PCA) on the Work Package 1 site and Trench PDZ4.41 within the Olympic, Paralympic and Legacy Transformations Planning Applications: Planning Delivery Zone 4, London Borough of Tower Hamlets E15. The report was commissioned from MoLAS-PCA by Capita Symonds Limited on behalf of the client the Olympic Delivery Authority (ODA).

Following the recommendations of the previous Detailed Desk-Based Assessment compiled for the Planning Delivery Zone, and subsequent consultation with the Greater London Archaeology Advisory Service (GLAAS), four evaluation trenches were excavated on the site.

The trenches, where possible, were excavated to the level of the natural gravels, through made ground and alluvium. The lower part of this alluvial sequence (below about 2m OD) was not extensively sampled, or examined in any detail because of rapid water ingress and contamination issues. However, a tentative interpretation of this lowest part of the sequence and a more robust interpretation of its upper part, together with the collection of a sequence of bulk and monolith samples from the deposits above c 2m OD was made.

Preliminary interpretations suggest that the lower sandy gravel deposits appear to form part of a tributary valley crossing the site and were overlain by a layer of organic material which was sealed by an alluvial clay sequence (ranging from 0.85m to1.90m in thickness). This sequence suggests that the watercourse may have migrated across this area and that, much of the tributary valley because abandoned by the active river channel formed a waterlogged marsh environment, or was subject to flooding over time.

Trench 4.21 produced evidence for a possible historic channel or tributary with associated gravel mid channel bank or foreshore deposits, which were sealed beneath the overlying alluvial clay deposits. The organic fill of this feature may represent the silting or ponding of a river channel that had become isolated from the main water courses in the area. Although as yet undated, the watercourse might be dated by radiocarbon, as the organic silty clay overlying the gravels and sands that accumulated on the riverbed contain abundant seeds and other plant remains suitable for radiocarbon dating.

A sequence of mollusc-rich silty clay deposits overlying the sands and gravels indicate that the watercourse silted up and became a creek or backwater. Microfossils (in particular diatoms and pollen) could be preserved within these fine-grained sediments that might provide information about the changing characteristics of the river, as well as vegetation and landuse in the surrounding area.

When the stratigraphic information from the site has been tied in to the information recovered from the surrounding area (by inputting the data into the MoLAS-PCA geoarchaeological database for the Olympics Project), linked to historic map evidence and dated it could have potential to contribute to our understanding of the evolving river regime of the Lower Lea.

Depending on the results of dating, it might also provide useful information about vegetation change and the changing environment of the Olympics Site during the historic period. Such information would be of real value, as environmental evidence

is poorly preserved within the (typically weathered) alluvial clay that in general accumulated across the floodplain in historic time. It is only from the diminishing areas of continuing wetland, man made cut features and abandoned stream channels, such as that recorded within the site that evidence for the historic environment is likely to survive.

Features of archaeological interest included a series of water management structures recorded in trench 4.17. These features consisted of a large open timber lined channel and later additions of a large brick culvert and cast iron drain associated with the East London Waterworks Company reservoir constructed c 1847-1848.

The alluvial sequence was generally sealed by a series of large 19th-20th century landfill deposits consisting of contaminated industrial and commercial waste.

In the light of revised understanding of the archaeological potential of the site the report concludes that further work on the samples already taken from the site would provide adequate mitigation of the archaeological resource.

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1 Introduction

1.1 Site background

Three evaluation trenches (Trenches PDZ4.17, 4.18 and 4.21) were excavated within Work Package 1 and one trench (Trench PDZ4.41) was excavated within Work Package 5 Planning Delivery Zone 4 (PDZ4) of the Olympic, Paralympic and Legacy Transformations Planning Applications, in the London Borough of Tower Hamlets, hereafter called 'the site' (Fig 1). Planning Delivery Zone 4 occupies a triangle of land bounded by the River Lea Navigation (Hackney Cut), the River Lea, and the railway on its western, eastern, and northern sides respectively. The two watercourses meet at the southern tip of the site. Work Package 1 was located within the north-west corner of PDZ4, while Work Package 5 was just to the south of this (Fig 2). MoLAS-PCA considers it appropriate to report the Work Package 5 trench together with Work Package 1 due to the comparatively close location of the trenches.

The OS National Grid Reference for the site centre is 537400 184570. The footprints of Work Packages 1 and 5 were defined by local property boundaries, and the limits of areas within which access was possible to excavate the evaluation trenches. Effectively, the footprint of work package 2 was delimited as a tool for defining the location and potential maximum extent of the group of trenches (Fig 1). Ground level within the site varies from between 6.83m OD and 7.47m OD in the area of King's Yard (PDZ4.16, 4.17 and 4.21) and 7.70m OD (PDZ4.41) to the south of Carpenter's Road (PDZ4.41). Ground level immediately adjacent to the site lies at *c* 7.70m OD. The site code is OL-06807 for Work Package 1 Trenches (PDZ4.16, 4.17 and 4.21) and OL-08207 for Work Package 5 (Trench PDZ4.41).

The proposed development of the site involves the construction of Spectator Support Buildings, including services and café, annexed to the proposed Olympic and Paralympic basketball stadium; an electricity substation and new power plants. These were the focus of five evaluation trenches. The Method Statement (MoLAS-PCA, 2007b) deemed that the additional construction proposals are not currently anticipated to have an impact upon the archaeological resource.

A desk-based assessment was undertaken for PDZ4 (MoLAS-PCA, 2007a), and should be referred to for information on the natural geology, archaeological and historical background of the site, and the initial interpretation of its archaeological potential. A Method Statement (MS) was prepared for PDZ4 (MoLAS-PCA 2007b), which formed the project design for the evaluation.

1.2 Planning and legislative framework

The legislative and planning framework in which the archaeological exercise took place was summarised in the *Desk Based Assessment* and *Method Statement* which formed the project design for the evaluation (MoLAS-PCA 2007a and b respectively).

1.3 Planning background

In accordance with local and national policies, archaeological evaluation PDZ4 in advance of its redevelopment was required as part of the planning process. Evaluation is intended to define the archaeological potential and significance of any deposits present on the site, so that the Local Planning Authority can formulate responses appropriate to any identified archaeological resource.

The evaluation of the site will be undertaken in support of a condition required by English Heritage and attached to the consent granted by the Olympic Delivery Authority Planning Decisions Team with respect to Olympic, Paralympic and Legacy Transformation Planning Application Reference 07/90010/OUMODA and Site Preparation Planning Application Reference 07/90011/FUMODA. Condition SP.0.38 of planning permission 07/90011/FUMODA states:

The site Preparation Development shall not be commenced until a Written Scheme of Investigation for Archaeological Works has been submitted to and approved by the Local Planning Authority. This shall be in accordance with the Generic Written Statement for Archaeology, the Written Scheme of Investigation for Archaeological Field Evaluation and the relevant Detailed Desk-Based Assessment. The archaeological work shall be undertaken in accordance with the approved Written Scheme of Investigation. If significant archaeological finds are encountered, further archaeological works or design measures may be required to mitigate the impact of development on those remains. This condition may be discharged on a Planning Delivery Zone Basis.

Reason: To ensure that archaeological remains are properly investigated and recorded.

1.4 Origin and scope of the report

This report was commissioned by Capita Symonds Ltd on behalf of the Olympic Delivery Authority and produced by the Museum of London Archaeology Service and Pre-Construct Archaeology Ltd (MoLAS-PCA). The report has been prepared within the terms of the relevant Standard specified by the Institute of Field Archaeologists (IFA, 2001).

Field evaluation, and the *Evaluation report* which comments on the results of that exercise, are defined in the most recent English Heritage guidelines (English Heritage, 1998) as intended to provide information about the archaeological resource in order to contribute to the:

- formulation of a strategy for the preservation or management of those remains; and/or
- formulation of an appropriate response or mitigation strategy to planning applications or other proposals which may adversely affect such archaeological remains, or enhance them; and/or
- formulation of a proposal for further archaeological investigations within a programme of research

1.5 Aims and objectives

The following research aims and objectives for PDZ4 were established in the Method Statement for the evaluation (MoLAS-PCA 2007b) and in the Desk Based Assessment for PDZ4 (MoLAS-PCA, 2007a) and are intended to address the research priorities established in the Museum of London's *A research framework for London Archaeology* (2002).

- Do Late Glacial deposits exist within the gravels on the site? What is the potential for past environment reconstruction and/or Late Upper Palaeolithic activity in these deposits?

- Did the tributary valley known to exist to the west of the site cross the site itself in the Pleistocene or Holocene and is there evidence for human activity associated with it? What were the characteristics of this valley in the prehistoric and historic periods and what information about the past environment and river regime might be available from it?

- Does evidence of prehistoric and historic occupation survive on the site?

- Does the post-medieval / pre-modern land surface survive on the site and what were its characteristics? Can it be related to the evidence of historic maps?

- What is the thickness, date and characteristics of the made ground across the site?

- Are there any surviving mechanised remains associated with the ELWC reservoir (pumps, engine equipment etc)?

2 Topographical and historical background

The following summary of the geological and archaeological background to the site is based upon the desk based assessment for PDZ4 (MoLAS-PCA 2007a).

2.1 Modern topography and drainage

Planning Delivery Zone Four is located on the western side of the floodplain (valley bottom) of the Lea Valley, between the Hackney Cut and the River Lea, which form the western and eastern boundaries of the site respectively. The extent to which these rivers are natural or have been manipulated or even entirely created by people in the past is not yet known. The pattern of rivers flowing across the site in the past will, however, have influenced its use and hence it's archaeological potential.

The landscape of the site in the past will have been very different to its characteristics today. In particular, the dumping of thick made ground deposits and fill in many areas has obscured its ancient topography. Historic excavations, such as quarrying and the creation of canals and reservoirs, have also removed evidence of the ancient landscape.

2.2 Natural topography and past landscape setting

The site lies on alluvium, which represents a range of different wetland and dryland environments existing on the valley floor ('floodplain') of the Lea from the Mesolithic period onwards. The alluvium overlies gravels and associated deposits of Palaeolithic date. The higher ground of the river terrace lies c 200m west of the site, on the opposite site of the Hackney Cut. The gravels are the most recent in a series of Pleistocene river terrace deposits, which today form an irregular flight of steps in the valley side. Tertiary bedrock, which in this area is variably London Clay and Woolwich and Reading Beds, underlies the gravels. The bedrock pre-dates the period of human evolution and thus its surface acts as the bottom line for deposits of archaeological interest.

Most of the site formed an area of slightly higher ground, raised above the deeper parts of the valley floor in the past and, as a result, dryland activity and occupation is more likely to have taken place than wetland exploitation, in prehistory in particular.

- In general the site is characterised by relatively thin alluvium that is likely to have similar characteristics and archaeological potential to that found in recent archaeological excavation at Warton Road (OL-00305). The alluvium represents relatively dry environments and may contain occupation evidence, especially as it lies close to the Old Ford area and to Roman riverside activity recently recorded at Crown Wharf, just beyond the south west boundary of the site. However, it is unlikely to have good potential for preserving environmental evidence.

- The deepest part of the valley floor lay close to the eastern boundary of PDZ4, which suggests that the site lay to the west of the main axis of the river, prior to its manipulation by people in the past.

- A tributary valley drained off the river terrace to the west of PDZ4 and may have crossed the site, although there are insufficient borehole records to assess whether it did so. The characteristics of this valley, beyond the site, suggest that from the Mesolithic onwards, it may have been an area of pools fringed with marshy land.

- Earlier evidence could survive within the tributary valley. In particular, Late Upper Palaeolithic and Early Mesolithic activity may be found at the base of the alluvial sequence, as knapping scatters and other remains from this earliest period of post glacial occupation have been found in similar locations further upstream. Furthermore, evidence relating to the Late Glacial period may be preserved within the gravels. Such information would be of considerable significance in reconstructing the environment in this part of the Lower Lea in the Late Upper Palaeolithic period. Deposits of Late Glacial date have already been identified in previous boreholes drilled to the east of the site.

2.3 Prehistoric

There are no known sites or finds of prehistoric date within the site. Evidence from a number of sites in the Lea Valley indicates however that it was well populated during the both the Bronze Age (1,800–600 BC) and Iron Age (600 BC–AD43) periods. These periods, along with the Neolithic (4000–1800BC), were characterised by forest clearance, permanent settlement and farming, with increasing population throughout each period. The gravel terrace beside the River Lea would have been attractive for early settlers, the gravels producing light, fertile and well-drained soils, with close access to the rivers for food resources and transport. Areas of adjacent marsh, prior to subsequent reclamation in the medieval period (possibly earlier) would have been exploited for varied and predictable resources such as food, from hunting and fishing, clay for pottery manufacture, reeds for basketry, along with rough grazing. Well-preserved Bronze Age and later timber structures and/or trackways such as those found elsewhere in the valley provided access across boggy areas between the areas of higher ground. A recent MoLAS-PCA evaluation at Carpenter's Road, *c* 300m to the east of the site revealed butchered bone in a peat land surface of Neolithic date and worked wood of Bronze Age date had been washed up as drift wood on the margins of the later river.

2.4 Roman

There are no known sites or finds of Roman date within the site. During this period the site lay *c* 5km to the north-east of Londinium and probably within its *territorium*, the eastern extent of which may have been defined by the River Lea. Evidence from archaeological investigations in East London suggests that this area was a managed agricultural landscape of scattered farmsteads and villas supplying produce to London.

The Lea was probably used to transport agricultural produce to the London area and in the late period, with pottery from Much Hadham (via the River Stort). Archaeological excavations have established that a Roman settlement existed at Old Ford, *c* 400m to the south-west of PDZ4, in the form of domestic and industrial structures; postholes, pits, and field ditches in the area of Lefevre Walk The settlement grew up beside a major Roman road, which crossed the marsh immediately

south of PDZ4, as it headed north-east from Aldgate towards the early military base and Colony at *Camulodunum* (Colchester). Pertinently, an archaeological evaluation on the opposite side of the Hackney Cut, *c* 100m to the south-west of the site revealed the footings of a Roman bridge or jetty. This comprised 40 timber piles on a WNW–ESE alignment, indicating the presence of a previously unrecorded road that presumably connected to Ermine Street beside the Northern Outfall sewer.

2.5 Saxon

There are no known sites or finds dated to the early medieval period within the site or its immediate vicinity. PDZ4 would have been situated within a rural area within the huge manor (estate) of Stepney (*Stebenhythe*), which included most of the area of modern Tower Hamlets.

Stratford means *fording place on the old street,* which probably refers to the Roman road/causeway across the marshes between Old Ford and Stratford, the conjectured line of which lies *c* 200m south of the site. Evidence of Saxon activity has been recorded on both sides of the valley: at Old Ford, *c* 550m to the north-west of the site, and at Stratford, *c* 650m to the north-east. The nature of this activity is currently poorly understood.

Tradition has it that after Danish marauders sailed up the River Lea to Hertford, King Alfred cut a series of channels in this part of the Lea, lowering the water level and forcing the enemy to leave their vessels aground and therefore prevent their escape. Alternatively, and perhaps more likely however, the channels may have been adapted for use as millstreams. Excavations in the area of Stratford Station, *c* 900m to the east of PDZ4 have revealed a Saxon timber revetment along the Channelsea, with associated leather waste and late Saxon pottery, and *c* 650m to the east of the site, a late 7th/8th-century bridge abutment or jetty of timber piles with masonry superstructure has also been revealed.

Throughout this period the site was located within marshland used for rough grazing. Domesday (AD1086) mentions a number of mills along the Lea and its tributaries although the location of these mills is uncertain. One mill was possibly located on the River Lea, *c* 450m south of the site.

2.6 Medieval

There are no known sites or finds dated to the later medieval period within PDZ4. As with much land elsewhere in East London, PDZ4 fell within Stepney manor and was held by the bishop of London and is recorded as such in Domesday (AD1086). Subsequent bishops owned this extensive manor, with several tenanted sub-manors, until the Reformation in the mid 16th century. The settlements of Hackney Wick, Old Ford and Bow were located on the very edge of the gravel terrace higher elevations, *c* 500m to the north-west, *c* 125m to the south-west and *c* 850m to the south of the site respectively.

The site is located on the floodplain of the River Lea, within a former marshland environment that has evolved from a landscape that humans exploited to one that they first modified through drainage and embankments, and then transformed through extensive reclamation. Prior to this, the marsh would have been prone to flooding and

largely unsuitable for settlement or arable cultivation. It is likely that the marshland within the Lea Valley began to be drained and reclaimed in the later medieval period (possibly earlier), primarily for economic reasons, in providing improved pasture for livestock and fertile land for crops. The site lay within the marshes on the northern edge of the ancient parish of St Mary, Stratford-le-Bow. Immediately to the north lay Hackney Parish, and there is some evidence to suggest that the two parishes shared the area covered by the site as communal pasture or meadow.

2.7 Post-medieval

Rocque's map of 1746 indicates that the site lay within Bow Marsh, *c* 500m to the north-east of the settlement at Old Ford. The topography of the marshland changed considerably, following the construction of the Hackney Cut (canal) in 1768, along with other modifications to watercourses and arrival of railway infrastructure in the mid 19th century. The site appears to lie within several reclaimed land parcels, apparently with one of the channels of the Lea crossing the site. Following the 1767 River Lea Act, the River Lee trustees constructed a straight channel along the western side of the valley, to the west of the main channel of the River Lea, named Hackney Cut or New Cut. The new channel was an improvement for river traffic. The west bank of the Hackney Cut (or Lea Navigation) forms the western border of PDZ4. Following an Act of 1829, the East London Waterworks Company constructed a channel parallel to the Hackney Cut, on its east site, named the East London Waterworks Canal (see fig 16 of MoLAS-PCA 2007a). This now infilled channel lies a short distance to the west of the site.

Prior to the mid 19th century, the site was located in reclaimed marshland and was used by the parishes of Hackney and St Mary Stratford le Bow for meadow. Before 1849, probably in *c* 1847–8, the East London Waterworks Company constructed a large triangular reservoir in PDZ4, immediately south of the site (Fig 3). This proved to be short lived, almost certainly because it proved difficult to maintain quality drinking water, and was decommissioned in 1892. The reservoir was subsequently infilled between 1892 an 1896.

Constructed around the turn of the century Carpenter's Road is depicted by the 1914 OS map crossing the northern end of PDZ4 and on the northern side of this is a complex of buildings marked 'Clarnico Works' (the factory buildings are still extant within the King's Yard area covered by PDZ4, work package 1). Some of the buildings north of the Carpenter's Road are indicated to have been damaged beyond repair by the LCC bomb damage maps, compiled at the end of WWII.

3 The evaluation

3.1 Methodology

All archaeological excavation and monitoring during the evaluation was carried out by a joint MoLAS-PCA team in accordance with the preceding *Method Statement* (MoLAS-PCA 2007b) and the MoLAS *Archaeological Site Manual* (MoLAS, 1994).

Three evaluation trenches were excavated targeting the locations of the impacts from the proposed development (PDZ 4.16 and PDZ4.17 within the footprint of the proposed power plant U3.1, and PDZ4.21 within the location of proposed electricity substation U2.1). Trench PDZ4.41 was located to evaluate the impact of proposed highway bridge H14 (Monier Road bridge) at the western boundary of PDZ4 (Fig 2).

Each trench was excavated to the base of the alluvial sequence, with machining of trenches done in stages in cases where archaeological features were encountered within the sequence. A mechanical excavator using a flat bladed ditching bucket undertook the bulk excavation, monitored by an archaeologist, a banksman and a site foreman at all times. A geoarchaeologist was in hand to visit the site and to take samples as required.

The three trenches positioned within the King's Yard (PDZ4.16, PDZ4.17 and PDZ4.21) were continually flooded at a depth of 1.80m below the present slab, possibly due to nearby broken water mains. This water was managed by the use of pumps, drainage gullies and both internal and external sumps. When the excavation penetrated the underlying alluvial clay deposits onto organic deposits and the sands and gravels, hydrostatic pressure quickly flooded the trenches. This water was also managed in the same way and, where possible, the alluvial deposits were immediately backfilled so as to re-seal the alluvium and to keep the two water deposits apart to prevent contamination. These necessary procedures and the difficult prevailing weather conditions of the trenches made the excavation and recording of these trenches challenging, and dictated the timing, speed of excavation and recording.

Work on Trench PDZ4.16 began in the week ending 2 November 2007 and was completed in the week ending 20 November. Trench PDZ4.17 began in the week ending 21 November and was completed in the week ending 15 January 2008 (work was interrupted due to the issues with ground water noted above) . Trench PDZ4.21 began in the week ending 12 October 2007 and was completed in the week ending 1 November. Trench PDZ4.41 began in the week ending 6 December 2007 and was completed 10 December.

The locations of the evaluation trenches were recorded by the MoLAS-PCA surveyor using an EDM. This information was electronically collated and plotted onto the OS grid. Levels were calculated from benchmarks established by Morrison's engineers, imported onto the site.

A written and drawn record of all archaeological deposits encountered was made in accordance with the principles set out in the MoLAS site recording manual (MoLAS, 1994). The site has produced: trench plans at 1:20 and 1:50 scale; context records; and

sections at scales of 1:20 and 1:50. Five monoliths samples, six bulk samples and one specific C14 sample were taken from across the site. The site records for Trenches PDZ4.16, 4.17 and 4.21 will be deposited under the site code OL-06807 in the LAARC. Trench PDZ4.41 produced 1 trench plan at 1: 20 scale and a section at 1:20 scale. The finds and records of the trench will be deposited under the site code OL-08207 in the LAARC.

3.2 Results of the evaluation

(See Fig 2 for trench locations).

3.2.1 OL-06807: Trench PDZ4.16

Location	Northern area of King's Yard
Dimensions	37.50m E–W by 19.50m N–S
Modern ground level	7.19m OD
Base of modern fill	2.90m OD
Depth of archaeological deposits seen (alluvium)	2.10m
Level of base of deposits observed and/or base of trench	0.80m OD
Natural observed	Sandy gravel 0.80m OD

Table 1 Trench PDZ4.16 deposit summary

See Fig 4 and Fig 5.

The trench, which measured a total of 37.50m E–W by 19.50m N–S, was machine excavated to a depth of 6.50m below present ground level of 7.19m OD.

The eastern half of the trench was fully excavated, stepping in 1.50m on all sides at intervals of 1m in depth to provide safe, stable trench edges. The western half of the trench was excavated in this fashion to a depth of 2.70m to 3m below ground surface. At this level a 2m wide E–W slot was then machine excavated a further 3.80m in depth along the middle of the trench for the purpose of revealing the underlying alluvial, organic and sandy gravel deposits. The lower part of this deposit sequence was only examined briefly by a geoarchaeologist, because of issues of rapid water ingress and contamination, and limited samples were taken.

At the base of the trench sandy gravel [14] was recorded at a height of 0.80m OD. This deposit continued across the whole of the trench at very similar levels and represents natural sand and gravel deposits (which may be of a Pleistocene or Holocene date).

Overlying this was a 0.20m thick deposit of organic silty clay to peat [13], recorded at a height of 1.05m OD. The deposit contained abundant wood and root fragments possibly accumulated in stable but waterlogged conditions such as a near channel wetland environments associated with the migration or isolation of near by channels and possibly with the onset of RSL rise during the early Holocene. A radiocarbon date from a sample of seeds would be needed to date this phase of ponding or wetland development and tie it in with local archaeological and environmental information.

The overlying deposit of alluvial clay [12] was 1.90m thick, recorded at a height of 2.90m OD, and like all other contexts in this trench, continued in all directions

beyond the limit of excavation. This represents probable seasonal flooding deposits associated with rising river levels probably linked to RSL rise and then later weathering during falling sea level in the Roman Period and the fluctuations from then to the historic period and/or caused by the embankment and management of river channels. The lower blue grey colouring indicates poor drainage and anaerobic conditions (gleying) as river level rises and is in contrast to the orange mottling, iron staining, of the upper alluvial clay. The iron staining suggests exposure to the surface and drier conditions as river level, perhaps linked to RSL, lowers but may also have accumulated further from the active river than the gleyed deposit, as a result of natural channel migration or channel manipulation.

Above this, and recorded at a height of 6.40m OD, was a 3.50m thick mixed deposit of silt and industrial waste [11] that represents dumping seen across the site that dates from the mid 19th century to the early 20th century.

This was sealed by a 0.40m - 0.50m thick layer consisting of silt, concrete and brick rubble that represents a levelling layer for the present concrete slab recorded with a surface height of between 6.83m OD in the south west and 7.19m OD in the north east.

3.2.2 OL-06807:Trench PDZ4.17

Location	Southern area of King's Yard
Dimensions	40m E–W by 18m N–S by 6.20m Deep
Modern ground level	Between 6.97m in N–E and 7.47m OD in S–W
Base of modern fill	6.40m OD (base of levelling for present concrete slab)
Depth of archaeological deposits seen	4.85m (top of drain to bottom of culvert)
Level of base of deposits observed and/or base of trench	1.35m OD (base of culvert)
Natural observed	1.10m OD (gravels and sands)

Table 2 Trench PDZ4.17 deposit summary

See Fig 6–Fig 9.

Sandy gravel deposit [41] was recorded at a height of 1.10m OD at the base of the trench and may be of a Pleistocene or Holocene date. Overlying this was a 0.15-0.20m thick layer of dense, dark brown peaty organic material [40] recorded at a height of 1.30m OD. At this level the natural water table was encountered. The organic deposit again represents stable more waterlogged conditions such as a slow flowing or ponding depositional environment.

Above this was a 1.50m thick deposit of alluvial clay [34], recorded at a height of 2.60m OD. This represents probable seasonal flooding deposits associated with rising river levels, probably linked to RSL rise, and then later weathering during falling sea level in the Roman Period and the fluctuations from then to the historic period and/or by the embankment and manipulation of river channels. The full deposit sequence was only uncovered and seen briefly by a geoarchaeologist, because of issues of rapid water ingress and contamination, and no samples were taken. No firm interpretation can be made, however, as information from environmental inclusions would be needed to understand the depositional environment of the alluvial clay.

Overlying clay deposit [34] was a re-deposited or disturbed clay layer [31] between 0.60m and 0.80m thick and recorded at heights of between 3.20m OD and 4.05m OD. This deposit contained occasional post-medieval pottery sherds and fragments of CBM dating to the 19th century. This could have been a plough soil but is more likely to be associated with the timber lined channel construction and dumping of the material above this layer. Overlying this was a series of large dump deposit of industrial and commercial waste [30] dating to the 19th century. This deposit was 3.40m thick and recorded at a height of 6.60m OD.

Also, constructed on top of clay layer [31] was a timber lined channel [27]. This channel was aligned E–W across the middle of the trench. In the west it appeared to continue beyond the limit of excavation and in the east it turned southwards, terminating at the southern extent of the trench and continuing eastwards beyond the limit of excavation. This feature was fragmented, but where it did survive it was constructed of posts, planking and internal braces made from re-used 19th-century building timber and is probably part of the system associated with the East London Waterworks Company reservoir, located to the south and open between *c* 1847 and 1892. The OS map of 1867 appears to depict this channel (Fig 3).

In the western half of the trench a N–S brick culvert [35] and a parallel later, large-diameter cast iron pipe [36], were recorded running into and terminating at the southern face of the timber lined channel. These may be associated with a channel depicted on the OS map of 1867 that cuts across the site and feeds into the East London Waterworks Company reservoir to the south of King's Yard and Carpenter's Road (Fig 3). Both the brick culvert and the later iron pipe did continue south, beyond the limit of excavation, and may have been associated with the reservoir.

The timber-lined channel was backfilled with commercial waste and household refuse in the early 20th century prior to the construction of a complex of buildings marked 'Clarnico Works' as seen on the 1914 OS map. Overlying the backfilled channel was a 0.50m to 1m thick levelling deposit [21] for the present concrete slab and tarmac surface recorded at levels of between 6.97m in the north-east and 7.47m OD in the south-west.

3.2.3 OL-06807:Trench PDZ4.21

Location	Eastern half of King's Yard
Dimensions	36.50m E–W by 18m N–S
Modern ground level	7.40m OD
Base of modern fill	3.30m OD
Depth of archaeological deposits seen (alluvium)	1.80m
Level of base of deposits observed and/or base of trench	Between 1.50m and OD 2.45m OD
Natural observed	Sandy gravel 1.50 to 2.45m OD

Table 3 Trench PDZ4.21 deposit summary

See Fig 10 and Fig 11.

As with the other two trenches positioned within the King's Yard (PDZ4.16 and PDZ4.17) the trench was continually flooded at a depth of 1.80m below the present slab, possibly due to nearby broken mains water supplies. This water was managed by

the use of pumps, drainage gullies and both internal and external sumps. When the excavation penetrated the underlying alluvial clay deposits onto organic deposits and the sands and gravels, water quickly pushed up into the trenches also. This water was also managed in the same way and where possible, the alluvial deposits were immediately backfilled so as to re-seal the alluvium and to keep the two water deposits apart to prevent contamination. These necessary procedures and the difficult conditions of the trenches made the excavation and recording of these trenches challenging and dictated the timing and speed of excavation and recording.

The trench, which measured a total of 36.50m E–W by 18m N–S, was machine excavated to a depth of 6.43m below present ground level of 7.40m OD. This deposit sequence, especially the lower gravel deposits, was only examined briefly by a geoarchaeologist, because of issues of rapid water ingress and contamination, and limited samples were taken. No firm interpretation can be made, however, as information from environmental inclusions would be needed to understand the depositional environment of the alluvial clay.

In the eastern half of the trench, at a depth of 5m, natural sandy gravel [4] was recorded between 1.50m OD and 2.45m OD, and may be of Pleistocene or Holocene date due to its elevation. The gravel deposit drops down in the western half of the trench to a depth of 1.50m OD before rising again towards the western extent of the excavation. This may represent a river tributary, secondary channel or backwater that runs along an approximate S–E by N–W alignment. The higher gravel to the east, at 2.45m OD, is likely to be channel bars tidally exposed or seasonal flood surge deposits of a historic channel.

Overlying the gravel unit and infilling the channel is a 1.10m thick deposit of peat grading into a humic clay [3], recorded at a height of 2.25m OD. This organic deposit also continued eastward beyond the possible channel where it eventually lenses out 1.50m to the west of the eastern limit of excavation. The organic material contained occasional mollusc shells, seed and wood fragments, and the varied plant assemblage suggests waterside and disturbed wetland conditions. This assemblage may represent the pools or reed beds fringing a channel or the waterlogged conditions as the channel silts up and becomes isolated from the main water courses in the area as a result of RSL changes, natural channel migration or manipulation of channels.

Sealing this were two deposits of alluvial clay that covered the trench and continued in all directions beyond the limit of excavation. The lower clay deposit [2], recorded at a height of 2.70m OD, was light blue grey in colour, 0.25m thick and where it directly overlaid the gravel [4] it contained iron staining and some small pebbles at its lower interface. The second clay deposit [1], recorded at a height of 3.30m OD, was light grey in colour and 0.60m thick. The iron staining in the clays that are towards the eastern limit of the trench [4], further from the organic channel fill and directly upon the gravels suggests exposure to the surface and drier conditions easterly further from the once active channel and towards the earlier gravel bars that subsequently provided drier conditions at a higher elevation. The alluvial sequence above this [1] may represents seasonal flooding deposits, and their later weathering, that probably occurred during falling sea level in the Roman Period and the fluctuations from then to the historic period. However, radiocarbon dates from seeds within this deposit would need to confirm this.

Overlying the clay, and recorded at a height of 6.88m OD, was a 3.55m thick mixed dump deposit of late 19th-20th century commercial and industrial waste. Finds from this deposit included 19th-century English stoneware bottles and tobacco pipe, in addition to a group of synthetic rubber or resin ball and cylinder objects with an agricultural or industrial function (see below Appendix 2: Finds). The interface with the underlying alluvial clay deposits was very sharp which may indicate that the clay had been truncated from above.
Sealing the dumped deposits was a levelling layer for a concrete slab that was recorded at a height of 7.43m OD that represents the areas present ground surface.

3.2.4 OL-08207: Trench PDZ4.41

Location	Bow Industrial Park
Dimensions	4m E–W by 3.60m N–S
Modern ground level	7.70m OD
Base of modern fill	3.30m OD
Depth of archaeological deposits seen (alluvium)	N/A
Level of base of deposits observed and/or base of trench	3.30m OD
Natural observed	N/A

Table 4 Trench PDZ4.41 deposit summary

See Fig 12 and Fig 13.

The trench, which measured 4m E–W by 3.60m N–S, was machine excavated to a depth of 4.40m below the present ground level of 7.70m OD. The trench sides were shored using a steel box frame and sheet piles to provide safe stable edges.

A mixed dump deposit of sandy silt and clay including 20th-21st century building rubble was recorded at a height of 5.70m OD. This deposit was excavated to a depth of 2.40m, but not bottomed. Towards the base of the trench at *c*3.70m OD the deposits became waterlogged and required a heavy-duty pump to keep drained. The ground at this point was very unstable and became unsafe to work on.

Overlying this was a 2m thick very mixed deposit of 20th-21st century clay, silt and building rubble used as a levelling backfill for the present concrete slab. The slab was recorded with a surface height of 7.70m OD.

Both these dumps may be levelling, or the fill of a large cut feature, perhaps the backfilled Waterworks Canal or re-working of the River Lee Navigation Canal. The soft sandy clay silt deposit towards the base of the trench may be up-cast material from the Waterworks Canal feature or the adjacent River Lee Navigation (Hackney Cut).

3.3 Stratigraphic interpretation of the site

The deposits recorded in the trenches can be allocated to seven distinct phases of deposition.

The date and environments represented by theses phases can only be tentatively suggested, however, until any radiocarbon dating and further work on the samples collected from the deposits has been undertaken.

3.3.1 Phase 1: Pleistocene deposits

The gravels recorded in the trenches with a surface of *c* 1m OD may be of Pleistocene date. However, inadequate observation was made of the gravels at this depth or higher to be confident about their date or environment of deposition.

3.3.2 Phase 2: Wetland and migrating channels

The organic clay and peat recorded between about 0.8-2m OD in the trenches might represent a different episode of landscape development than the alluvial or organic deposits found higher in the sequence.

It is likely that the lower organic layer reflects the migration of early channels easterly across a wider area of near channel low lying wetlands with the earliest channel lying to the west of the site. The date and environment of deposition are not fully understood, however, as water ingress and contamination issues led to little opportunity to examine the lower deposits and limited samples were taken.

3.3.3 Phase 3: Lower Alluvium

The alluvial clay recorded between about 1–2m OD across the site may represent a different episode of landscape development than the alluvial deposits found higher in the sequence. This alluvium most likely pre-dates the silting up the channel evident in PDZ4.21and may represent seasonal overbank flooding of a drying wetland land surface and possibly mudflats.

3.3.4 Phase 4: Active historic channel

The higher elevation gravel deposits, 2.45m OD, to the east of the site, within PDZ4.21, suggest they are of a Holocene and possibly historic date. Due to constraints put on the excavation as a result of water ingress and contamination digging further into the gravels along the length of the trench was not possible.

However, it is proposed that the gravels to the east of PDZ4.21 are bedded gravels, likely to have accumulated on a foreshore or as bars on the riverbed and may be interbedded and contemporary with the wetland deposits to the west.

3.3.5 Phase 5: Silting up of river channel

Organic silty clay and peat deposits recorded within the channel in PDZ4.21 and to the west and east of the possible historic channel are likely to represent the silting up

of the watercourse and the development of a backwater or tidal creek. These deposits were recorded between *c* 1.5m and 2.45m OD, being thickest where the underlying gravels were lower.

More information about the environment represented by these contexts and their date might be obtained from the samples taken from them, which preserved good assemblages of molluscs as well as plant remains.

3.3.6 Phase 6: Development of drier land surface

The uppermost alluvium recorded in the trench was weathered and likely to have accumulated as a result of episodic flooding of an otherwise dry land surface.

It is likely to be of a historic date but may have been truncated by the later diversion and canalisation of channels through the site associated with the waterworks reservoir to the south. In the absence of truncation the uppermost part of this alluvium ([1]) is likely to have formed the pre-modern dumping ground surface, which lay between 2.9m and 3.30m OD.

3.3.7 Phase 7: 19th century and later developments

The trenches located north of Carpenter's Road in King's Yard have provided evidence for the area being used for the dumping of both industrial and commercial waste through the 19th century prior to the area being developed with factory buildings in the early 20th century. This dumping has resulted in the build up of an average of 3.50m of mixed, contaminated waste covering the entire area.

Furthermore, Trench PDZ4.17 has also provided evidence for a phase of water management-related activity during the 19th century. This consists of an E–W and N–S aligned timber-lined channel and the later additions of a N–S brick culvert and large cast iron pipe. These structures probably relate to the East London Waterworks Company reservoir located to the south of King's Yard and Carpenter's Road and possibly also to later water management in the area. The brick culvert may have been constructed to pass under Carpenter's Road, which was constructed around the turn of the 19th century.

PDZ4.41, located south of Carpenter's Road, has provided evidence for modern dumping , possibly relating to the present River Lee Navigation (Hackney Cut).

3.4 Evaluation of environmental evidence

Anne Davis, Alan Pipe and Virgill Yendell

3.4.1 Introduction

Several visits were made by a MoLAS-PCA geoarchaeologist to examine, record and sample the natural sequence exposed within the evaluation trench. The geoarchaeologist's description and interpretation of the deposits form part of the trench results and stratigraphic interpretation in sections 3.2 and 3.3 above.

The stratigraphy recorded in a representative profile of the trench sequence, as drawn and described by the geoarchaeologist, should be entered into the MoLAS-PCA geoarchaeological stratigraphic database of the Lower Lea as part of the assessment.

This database will be used in post excavation stages of the project, to reconstruct the evolving past environment of the Olympics site and to target samples and locations for analysis.

3.4.2 Sediment characteristics

A sequence of three monolith tins was taken through the natural deposit sequence, at the eastern end of the PDZ4.21 and a single monolith was taken through the organic deposits in PDz4.17. These tins provide an undisturbed column of sediment, as revealed in the trench sections, for off-site examination. The location selected for sampling was considered to be a representative profile of the deposits exposed in the trench. The monolith is suitable for sub-sampling for microfossils and sedimentary techniques, intended to gain a better understanding of the changing environments represented by the Holocene gravels and alluvial deposits across the site as a whole.

Sedimentary techniques such as loss on ignition, magnetic susceptibility and soil micromorphology might tell us more about the depositional and post depositional environment of the alluvial clay (contexts [1], [2], [12] and [34]) in particular. Microfossil examination might be able to provide information about the river characteristics and surrounding vegetation.

The monoliths will be retained until environmental assessment is undertaken, when sub-samples for pollen and diatoms will be examined to determine their potential for past environment reconstruction (see below). Further retention until the analysis stage of the project is likely to subsequently be required, as this is when more detailed sedimentary techniques will be carried out.

3.4.3 Microfossils

The alluvial and organic clay deposits recorded as contexts [3], [13], and [40] (accumulated in a possible backwater or tidal creek) and [1], [2], [12] and [34] (accumulated as a result of episodic flooding of a relatively dry land surface) might preserve microfossils, such as pollen and diatoms, as well as cladocera, chironomids and other microscopic remains. Such evidence can provide valuable information about the evolving past environment. In particular information about the past vegetation, water characteristics, and indirect evidence for human activity, such as landscape clearance, cultivation and other disturbance might be gleaned. Such evidence is likely to be complimentary to the information obtained from macro-remains from the bulk samples.

Preservation in the upper part of the alluvial clay ([1] and [2]) may be poor, as a result of oxidation and weathering, however. The survival of plant macro remains was also relatively low in the creek or backwater deposits ([12] and [34]), suggesting they might also have been subject to episodic drying out and weathering, which may lead to preservation of only the most durable pollen, spores and diatoms. This is only a guide - without assessment of the microfossil inclusions their survival and potential cannot be reliably evaluated and the preservation of microfossils in the deposits needs to be assessed as a further stage of work.

3.4.4 Bulk sample processing

Five environmental bulk soil samples were collected from Site OL-06807, for the potential recovery of plant and invertebrate remains, to provide information on the local environment and any human activity at the time of deposition. Any such information would complement that obtained from monolith samples through sedimentary sequences. The aim of the evaluation was to establish the presence or absence of biological remains, and whether a full assessment of any of the materials present in the samples should be carried out.

Four of the samples ({3},{4},{5} and {7})came from PDZ:4.21 and one ({12}) from PDZ:416. Five litre sub-samples from each sample were processed by flotation over a 0.25mm mesh, with the residue washed over a 0.5mm mesh. The flots were stored wet to help with the preservation of any organic material and the wet sieved fractions were dried. Five litres of soil or less were retained from each sample for further work.

Small amounts of each flot were scanned rapidly under a low-power binocular microscope to determine whether further assessment would be worthwhile.

3.4.5 Radiocarbon dating

Although some idea of the date of the deposits excavated has been inferred from their characteristics and level, no reliable date has yet been obtained for the sequence. Environmental evidence, unlike artefacts, is not intrinsically dateable and the information about the past landscape preserved in the deposit sequence means little unless it is tied in to an archaeological timeframe.

In general, few artefacts suitable for spot dating were recovered from the alluvial sequence (excepting the uppermost part of the alluvial clay). However, the deposits excavated contained twigs and other plant remains, from which radiocarbon dates might be obtained. Although not all sequences had samples specifically for radiocarbon dating, the sequence of bulk samples (and the monoliths if necessary) should provide sufficient material for the extraction of single entity organic remains suitable for radiocarbon dating by AMS (Accelerator Mass Spectrometry).

3.4.6 Molluscs and ostracods

3.4.6.1 Terrestrial molluscs

Mollusc shell	estimated <50 shells. Total <0.002 kg

Table 5 Summary of molluscs

A single shell of grass snail *Vallonia sp.* was recovered from {3}; a small group of up to five shells of the same snail taxon was also present in {7}. Sample {4} produced a single unidentified terrestrial snail (unidentified snail species 1). The shells were in moderate/good preservation.

3.4.6.2 Freshwater molluscs

Very occasional shells of freshwater molluscs were seen in the flot of sample {1}, and occasional to moderate shells in sample {7}. Sample {7} produced a single shell of river nerite *Theodoxus fluviatilis*, with small groups of fewer than five shells of

bithynia *Bithynia sp.*, pond snail Lymnaeidae, two species of ram's-horn snail Planorbidae and one small species of bivalve, possibly pea shell *Pisidium sp.* The shells were generally in good condition.

5.3.12.5 Ostracods

Moderate numbers of ostracod valves were recovered from sample {7} only.

3.4.7 Plant remains

No charred plant remains were seen in most of the samples, although occasional small flecks/fragments of charcoal were present in samples {4} and {5}.

All samples contained moderate or abundant waterlogged root fragments and/or rootlets, and these were very abundant in sample {12}, where they made up 100% of the very large (1000ml) flot.

In most samples very few other organic remains were seen, although a single seed was found in sample {3} and fewer than ten, mostly from aquatic and wetland species, in sample {5}. Only sample {7} contained a substantial and varied assemblage of seeds consisting mostly of wetland species such as sedges (*Carex* spp.), golden dock (*Rumex maritima*), water plantain (*Alisma* sp.) and gypsy-wort (*Lycopus europaeus*). These are mostly waterside or wet-ground species rather than truly aquatic plants.

3.4.8 Insect remains

Occasional fragments of beetle (Coleopteran) exoskeleton were present in sample {3}, which also contained fragmentary larval cases from caddis flies (Trichoptera).

	sample	soil proc (l)	soil retained (l)	flot vol (ml)	chd wood	wlg seeds/fruit	wlg misc	insects	molluscs	potential
PDZ:4.21	3	5	<5	5		+	++		+	1 seed, rootlets
PDZ:4.21	4	5	5	10	++		+++			rootlets, chcl frags
PDZ:4.21	5	5	5	20	++	+	+++			Few seeds, rootlets, chcl frags
PDZ:4.21	7	5	5	100		+++	+++	+	+++	Good w'l seeds & ostracods; mod molluscs
PDZ:4.16	12	5	5	1000			+++			V many roots

Table 6 Evaluation of environmental evidence

3.5 Assessment of the evaluation

GLAAS guidelines (English Heritage, 1998) require an assessment of the success of the evaluation 'in order to illustrate what level of confidence can be placed on the information which will provide the basis of the mitigation strategy'.

In the case of OL-06807 and OL-08207, the evaluation trenches revealed large deposits of 19th–20th century made ground. This made ground consists of an average of 3.50m of contaminated industrial and commercial waste. The evaluation trenches have also revealed a phase of water management-related structures dating to between the 19th and early 20th centuries. These were an open timber-lined channel and later additions of a brick culvert and an iron pipe. These features may be associated with the 19th-century East London Waterworks Company reservoir to the south and also to later drainage systems.

These late features and dumped deposits both truncate and overlie a series of alluvial clay, organic and sandy gravel deposits recorded across the site. Observation of the deposit sequence of archaeological interest was hampered by rapid water ingress, owing to its proximity to several rivers, and contamination issues. This meant the lower part of the sequence was only cursorily examined.

Further clarification of the evaluation results, involving work on the samples and dating, in particular, is needed to be confident in the interpretations presented. In order to understand the archaeological significance of the deposits it will also be necessary to place the results in the context of the stratigraphic sequence recorded in nearby trenches and boreholes. However, the stratigraphic sequence and deposit characteristics as discussed above are internally consistent, as the deposit sequence observed in the south west test pit appears to correlate with that recorded in more detail in the northern part of the trench and the results presented in this report are considered to be an accurate record of the deposits existing on the site.

4 Archaeological potential

4.1 Realisation of original research aims

The extent to which the evaluation has been able to address the individual research objectives established in the Method Statement for the evaluation is discussed below:

Do Late Glacial deposits exist within the gravels on the site? What is the potential for past environment reconstruction and/or Late Upper Palaeolithic activity in these deposits?
Although gravels of possible Pleistocene date were observed in all of the trenches, they were not recorded in any detail or sampled, owing to contamination and rapid water ingress. As a result, there is no potential for obtaining information about Late Upper Palaeolithic activity or environment from the trench.

Did the tributary valley known to exist to the west of the site cross the site itself in the Pleistocene or Holocene and is there evidence for human activity associated with it? What were the characteristics of this valley in the prehistoric and historic periods and what information about the past environment and river regime might be available from it?
Evidence for a tributary valley formerly crossing the site and subsequently silting up was found. The trenches in the west of the site (PDZ4.16 and PDZ4.17) provided evidence that a watercourse may have migrated from the west to the vicinity of PDZ4.21 during the historic period. Formerly the area had been mainly wetland with either foreshore or mid channel bank deposits to the west of PDZ4.21. The lowest channel or wetland deposits appear to be to the east ([13]) and potentially dropping further beyond the limit of the western trenches (PDZ4.16 and PDZ4.17) and the tributary valley side may rise to the east.

Evidence for the former wetland and river channel that crossed the site comprised gravels, organic and peat deposits and overlain by silty clay. Foreshore gravels, or gravels accumulated as bars on the riverbed ([4]) were overlain by the organic silty clay of mud flats or backwater ([3], [13] and [40]). Further information about the characteristics of this watercourse might be obtained by examination of environmental micro-and macrofossils preserved in the bulk and monolith samples taken from these deposits. Scrutiny of historic map evidence in conjunction with deposit modelling during the assessment stage of the project might be able to shed light on the relationship of this tributary valley and the historic channel to the development of the River Lea, and Waterworks Reservoir.

Seeds and twigs suitable for radiocarbon dating were preserved within the wetland deposits ([13] and [40]) and those representing the silting up of the historic channel ([3]). Radiocarbon dates from these deposits would provide a date for the episodes of channel activity and abandonment observed.

The small terrestrial and freshwater assemblages provided by {3}, {4} and {7} have some potential for ecological interpretation of the habitats from which the snail and bivalve species derive. Identification of each species may allow some comment on

local habitat and perhaps other source materials, e.g. flooring or roofing, responsible for their presence in the deposit.

The assemblage of ostracod valves from {7} has potential in terms of identification of species and habitat interpretation based on their ecological requirements.

The small invertebrate assemblage provides small groups, particularly those from {7}, of local significance only. In particular, the freshwater mollusc and ostracod fauna from {7} will allow some insight into habitat characteristics.

Does evidence of prehistoric and historic occupation survive on the site?
No evidence for prehistoric occupation was seen during the evaluation. The earliest evidence for historic occupation in the area is the 19th century water management systems and industrial dumping.

Does the post-medieval / pre-modern land surface survive on the site and what were its characteristics? Can it be related to the evidence of historic maps?
The pre 20th century land surface appears to have been truncated by both the construction of water management systems and during the areas use as a large scale dumping ground in the 19th century.

What is the thickness, date and characteristics of the made ground across the site?
The made ground across the site consists of an average of 3.50m of contaminated industrial and commercial dumped waste dating to between the 19th and early 20th centuries.

4.2 General discussion of potential

The evaluation has shown that a sequence of alluvial deposits of archaeological interest survives below about 3.3m OD and sealed by roughly 3.5m of 19th and 20th century made ground.

The lower part of this organic alluvial sequence (below about 2m OD) was only sampled to a limited extent, and not examined in any detail because of rapid water ingress and contamination issues. However, a tentative interpretation of this lowest part of the sequence and a more robust interpretation of its upper part, together with the collection of a sequence of bulk and monolith samples from the deposits above *c* 2m OD was made.

Preliminary interpretations suggest that a tributary valley formerly crossed the site. The watercourse of the valley may have migrated across an area of wetland or mudflats to the west of the site, as suggested by the slope of the deposits in PDZ4.16 and PDZ4.17. No accessible sondage or test pit was excavated within the deposits to sufficiently examine the deposits relating to the earlier wetland deposits and possible watercourse in any detail and they could be of prehistoric or historic date.

A sequence of organic silty clay deposits overlying the sands and gravels indicate that the watercourse silted up and became a creek or backwater. Microfossils (in particular diatoms and pollen) could be preserved within these fine-grained sediments that might provide information about the changing characteristics of the river, as well as vegetation and landuse in the surrounding area.

The height and characteristics of the gravel deposits that represent the active watercourse suggest they could be of historic age. Although as yet undated, the

watercourse might be dated by radiocarbon, as the organic silt interface with the gravels and sands that accumulated on the riverbed or foreshore contain seeds and other plant remains suitable for radiocarbon dating. These plant remains, together with some insects and snails also preserved within the samples taken from the active channel deposits have potential to reconstruct the characteristics of the river and the surrounding environment.

When the stratigraphic information from the site has been tied in to the information recovered from the surrounding area (by inputting the data into the MoLAS-PCA geoarchaeological database for the Olympic Project), linked to historic map evidence and dated it could have potential to contribute to our understanding of the evolving river regime of the Lower Lea.

Depending on the results of dating, it might also provide useful information about vegetation change and the changing environment of the Olympics Site during the historic period. Such information would be of real value, as environmental evidence is poorly preserved within the (typically weathered) alluvial clay that in general accumulated across the floodplain in historic time.

The 19th century water-related features will assume greater meaning when correlated with other associated finds from the vicinity of PDZ4.

4.3 Significance

The geoarchaeological evidence seen on the site has been able to provide a significant amount of information which will aid in the understanding of the evolving environment of the Lea Valley. This information is able to contribute to our understanding of the past environment of the site and it surroundings, and will assist in landscape reconstruction models being developed, which is certainly of local significance.

Further work on the environmental samples taken from the site should clarify the date and environments represented by the active and silting-up river channel deposits. When their date is known, and taken together with the results of other sites within the Olympics footprint, the results have potential to be of regional significance.

Whilst the archaeo-environmental remains and evidence preserved on the site are undoubtedly of local to regional significance there is nothing to suggest that they are of regional or national importance.

The significance of the 19th century structures is enshrined in their association with the East London Waterworks activities in the area. When other related finds are analysed along with their context, it will be possible to determine if these finds are significant to the understanding of the company.

5 Assessment by EH criteria

The recommendations of the GLAAS 1998 guidelines on *Evaluation reports* suggest that

'Assessment of results against original expectations (using criteria for assessing national importance of period, relative completeness, condition, rarity and group value) .....' (Guidance Paper V, 4 7)
A set of guide lines was published by the Department of the Environment with criteria by which to measure the importance of individual monuments for possible Scheduling. These criteria are as follows: *Period*; *Rarity*; *Documentation*; *Survival/Condition*; *Fragility/Vulnerability*; *Diversity*; and *Potential*. The guide lines stresses that 'these criteria should not...be regarded as definitive; rather they are indicators which contribute to a wider judgement based on the individual circumstances of a case'.[1]

In the following passages the potential archaeological survival described in the initial Assessment document and Section 0 above will be assessed against these criteria.

Criterion 1: period
Taken as a whole, archaeology of the site is not characteristic of any particular period. The Evaluation indicates a multi period site.

Criterion 2: rarity
There is nothing to suggest that any of the likely archaeological deposits are rare either in a national or regional context.

Criterion 3: documentation
Early OS maps and other historical documentation from the 19th and 20th centuries have provided information that can be related to features recorded during the evaluation.

Criterion 4: group value
The landscape features relate to and are part of the wider pattern seen within the Olympic Park and elsewhere in the Lea Valley. Full interpretation is only possible in that context. The post-medieval survival is remnants of part of the spread eastwards from the City of London and the industrialisation of the site area, combined with the management of the water courses within the Lea Valley.

Criterion 5: survival/condition
The evaluation results have demonstrated that (geo)archaeological remains were preserved beneath several metres of modern made ground, although within areas of development will have been truncated to dramatically different levels.

Criterion 6: fragility
Experience from other sites has shown that isolated and exposed blocks of stratigraphy can be vulnerable to damage during construction work.

Criterion 7: diversity

[1] Annex 4, DOE, Planning and Policy Guidance 16, (1990). For detailed definition of the criteria see that document. Reference has also been made to Darvill, Saunders & Startin, (1987); and McGill, (1995)

Clearly, taken as a whole, the deposits at the site do not represent a diverse and heterogeneous group of archaeological remains of all types and periods. However, this diversity is in itself the product of a random process of vertical and horizontal truncation and separation. There is no reason to suggest that the diversity *per se* has any particular value which ought to be protected.

Criterion 8: potential
(The term Potential in this context appears to mean that though the nature of the site, usually below-ground resources, cannot be specified precisely, it is possible to document reasons predicting its existence and importance)

The evaluation has shown that deposits of alluvium overlying early Holocene gravels are likely to exist elsewhere in the local vicinity. Further examination of samples already taken from the alluvial deposits on the site hold the potential to enhance current understanding of the natural and manmade environment of this part of the Lea Valley from the early prehistoric to modern periods. Additionally, understanding of the 19th century remains will come from contextualising analysis.

6 Proposed development impact and recommendations

It is proposed to construct Spectator Support Buildings, including services and café, associated with the Olympic and Paralympic Games basketball stadium. New services infrastructure are also proposed for the site comprising an electricity substation and new power plants. The construction methods for these works will disturb and destroy all archaeological deposits within their footprints. Other construction works are planned, though these have been assessed as not impacting upon the archaeological resource (MoLAS-PCA, 2007b).

The assessment above (Section 5) does not suggest that preservation *in situ* would be an appropriate mitigation strategy. MoLAS-PCA considers that earlier deposits survive beneath 19th and 20th century made ground deposits, which are of little importance for archaeological finds and features.

Initial evaluation of the samples collected suggests they have good palaeoenvironmental potential. In particular, the bulk samples are rich in seeds ostracods and molluscs and if dated to the historic period both bulk and monolith samples might preserve useful information about vegetation change and the changing environment of the Olympics Site from a time when environmental evidence is typically poorly preserved. If from an earlier period they will contribute to our understanding of the evolution of the tributary valley that enters the floodplain from the west at this point, which has previously been recorded but as yet poorly understood.

No further excavation is required. However, it is recommended that further work be undertaken on the samples already taken from the sequence to gain a better understanding of the local river regime and evolving past landscape.

In order to clarify the potential of the samples taken and to refine the research aims they might be able to address, it is recommended that:

- Five litres of each of the unprocessed samples be processed by paraffin flotation for the assessment of insect remains (6 samples);
- Five litres of each of the unprocessed samples be wet sieved and together with the wet-sieved fractions of the parts of samples already processed, examined to assess the potential of the snail and ostracod assemblages preserved (6 samples);
- Five litres of each of the unprocessed samples be floted and the flots (together with those already processed) assessed for plant remains (6 flots);
- Three radiocarbon dates are obtained by AMS on identified twigs, seeds or other plant material from the gravels ([6]), the sandy deposit [5] and/or the base of the overlying alluvial clay deposit [4]; and the interface between contexts [3] and [4] within the alluvial clay;
- Pollen and diatom assessment of the stratigraphic sequence is undertaken (12 sub-samples for each to be cut from the monolith tins)
- The stratigraphic, dating and sample assessment data is entered into the MoLAS-PCA geoarchaeological stratigraphic database and used to update the current GIS models of the past topography and environment, to contribute to the environmental assessment of PDZ2;

- Research aims that might realistically be addressed by the samples are identified and a report prepared by a geoarchaeologist or environmental archaeologist, summarising the environmental assessment results and the potential of the samples collected from the site.

It is also recommended that the results of this evaluation and of the proposed environmental mitigation are assimilated into a site-wide assessment of all archaeological interventions to assign contextual significance and further refine the importance of the archaeological survival, and thereafter assimilated into any publication discussing/disseminating the results.

The decision on the appropriate archaeological response to the deposits revealed within the evaluation rests with the Local Planning Authority and their designated archaeological advisor (GLAAS).

7 Acknowledgements

MoLAS-PCA would like to thank Capita Symonds Ltd for commissioning this report, and David Divers (English Heritage GLAAS) for monitoring the project on behalf of the London Borough of Hackney.

The author would like to thank Elaine Eastbury, Michael Tetreau, Frank Zwettler, Margaret Feyok, Phil Frickers and Jem Rogers, for their on-site assistance, Gary Brown for his project management, and to Raoul Bull and Kieron Tyler for off-site project management and editing. MoLAS-PCA geoarchaeologists Jane Corcoran, Virgil Yendell and Graham Spurr worked on the site and Virgil Yendell contributed to the text of this report. In addition, thanks are due to the contractor's groundworks and engineering team for their cooperation and assistance during the project.

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ODA, 2007d Olympic, Paralympic and Legacy Transformation Planning Applications Annexure Code of Construction Practice, Vol 15 (Document no. OLY/GLB/ACC/DOC/CCP/01)

9 Appendix 1: NMR OASIS archaeological report form

Project details

Project name	Olympics Evaluation, Planning Delivery Zone 4 Incorporating Work Package 1 and Trench PDZ4.41, Work Package 5.
Short description of the project	This report presents the results of an archaeological evaluation carried out by the Museum of London Archaeology Service and Pre-Construct Archaeology (MoLAS-PCA) on the Work Package 1 site and Trench PDZ4.41 within the Olympic, Paralympic and Legacy Transformations Planning Applications: Planning Delivery Zone 4, London Borough of Tower Hamlets E15. The report was commissioned from MoLAS-PCA by Capita Symonds Limited on behalf of the client the Olympic Delivery Authority (ODA). Following the recommendations of the previous Detailed Desk-Based Assessment compiled for the Planning Delivery Zone, and subsequent consultation with the Greater London Archaeology Advisory Service (GLAAS), evaluation trenches were excavated on the site. The trenches, where possible, were excavated to the level of the natural gravels. These sandy gravel deposits were overlain by a thin layer of organic material which was sealed by an alluvial clay sequence (ranging from 0.85m to1.90m in thickness), with suggests that much of the area was waterlogged marsh environment or subject to flooding over time. Trench 4.21 produced evidence for a possible ancient channel or tributary cutting the natural gravels and then sealed beneath the overlying alluvial clay deposits. The organic fill of this feature may represent the silting or ponding of a river channel that had become isolated from the main water courses in the area. The alluvial sequence was generally sealed by a series of large 19th-20th century landfill deposits consisting of contaminated industrial and commercial waste. Features of archaeological interest included a series of water management structures recorded in trench 4.17. These features consisted of a large open timber lined channel and later additions of a large brick culvert and cast iron drain associated with the East London Waterworks Company reservoir constructed c 1847-1848.
Project dates	Start: 16-10-2007 End: 14-01-2008
Previous/future work	No / Not known
Any associated project reference	OL-06807 - Sitecode

codes	
Any associated project reference codes	OL-08207 - Sitecode
Type of project	Field evaluation
Site status	Local Authority Designated Archaeological Area
Current Land use	Industry and Commerce 1 - Industrial
Current Land use	Industry and Commerce 4 - Storage and warehousing
Monument type	TIMBER LINED CHANNEL Post Medieval
Monument type	BRICK CULVERT Post Medieval
Methods & techniques	'Environmental Sampling','Targeted Trenches'
Development type	Public building (e.g. school, church, hospital, medical centre, law courts etc.)
Development type	Land reclamation/de-contamination
Development type	Olympic Development
Prompt	Planning condition
Position in the planning process	After full determination (eg. As a condition)

Project location

Country	England
Site location	GREATER LONDON TOWER HAMLETS TOWER HAMLETS Olympic Development
Postcode	E15
Study area	0.24 Kilometres

Site coordinates	TQ 53727650 18458955 50.9444710607 0.188511614174 50 56 40 N 000 11 18 E Point
Site coordinates	TQ 53762212 18457963 50.9444529031 0.189002846467 50 56 40 N 000 11 20 E Point
Site coordinates	TQ 53737738 18395951 50.9439021607 0.188628520059 50 56 38 N 000 11 19 E Point
Height OD	Min: 0.80m Max: 1.10m

Project creators

Name of Organisation	MoLAS/PCA
Project brief originator	Capita Symonds Ltd
Project design originator	MoLAS/PCA
Project director/manager	Nick Bateman
Project supervisor	Paul Thrale
Type of sponsor/funding body	ODA

Project archives

Physical Archive recipient	LAARC
Physical Archive ID	OL-06807
Physical Contents	'Ceramics','Metal'
Digital Archive recipient	LAARC

Digital Archive ID	OL-06807
Digital Contents	'Ceramics','Metal'
Digital Media available	'Images raster / digital photography','Survey'
Paper Archive recipient	LAARC
Paper Archive ID	OL-06807
Paper Contents	'Ceramics','Metal'
Paper Media available	'Context sheet','Matrices','Plan','Report'

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Planning Delivery Zone 4 incorporating Work Package 1 and Trench 4.41, Work Package 5.
Author(s)/Editor(s)	'Thrale, P'
Date	2008
Issuer or publisher	MoLAS
Place of issue or publication	MoLAS

Entered by	Paul Thrale (molas.archive@museumoflondon.org.uk)
Entered on	14 April 2008

10 Appendix 2: Finds

10.1 Animal bone

Alan Pipe, Osteology Section, Museum of London Archaeology Service

	Weight (g)	No. fragments	No. boxes
Animal bone (hand-collected)	NIL	NIL	NIL
Animal bone (wet-sieved)	0.010	5	one archive quality 'shoebox'

Table 7 Contents of animal bone archive

This report identifies, quantifies and interprets the animal bone from wet-sieved sample {5} only. The sample group was recorded directly onto Excel spreadsheets in terms of weight (kg), estimated fragment count, species, carcase-part, fragmentation, preservation, modification, and the recovery of epiphyses, mandibular tooth rows, measurable bones, complete long bones, and sub-adult age groups. The assemblage was not recorded as individual fragments or identified to skeletal element. All identifications referred to the MoLAS reference collection. Fragments not identifiable to species or genus level were allocated to an approximate category; 'sheep-sized', as appropriate.

10.1.1 Summary

This assemblage provided only five fragments, approximately 0.010 kg, of moderately-preserved wet-sieved animal bone with a minimum fragment size generally between 25 and >75mm. All the fragments derived from 'sheep-sized' longbone.

There was no evidence of butchery, working, burning, gnawing, pathological change or any other modification.

The group produced no evidence for age at death with no mandibular tooth rows and no epiphyses. There was no metrical evidence.

10.1.2 Outstanding work

There is no outstanding assessment work.

10.2 Clay tobacco pipe

Lyn Blackmore

The one clay tobacco pipe was recorded in accordance with current MoLAS practice and entered onto the Oracle database, using the Chronology of London Bowl Types (Atkinson and Oswald 1969).

Total no. of fragments	1
No. of bowl fragments	1
Decorated pipes	1

Table 8 Clay tobacco pipe quantification

Context	B\S\M	Date range	tpq	Comments
0 (Trench PDZ 4.21)	1 bowl	1840–1880	1840	Complete bowl with internal sooting

Table 9 Clay tobacco pipe dates, by context

The pipe bowl from Trench PDZ 4.21 (from the uppermost thick, mixed dump deposit) has leaf decoration on both seams and is a variation on form AO29 (Atkinson and Oswald 1969). The dating of this type fits well with that of the pottery (see below). The clay pipe is of local significance only.

10.3 The pottery

Lyn Blackmore

Post-Roman pottery	1.827 kg	6 sherds, 6 complete bottles

Table 10 Pottery: summary

A collection of six 19th-century bottles was recovered from Trench PDZ 4.21, from the uppermost thick, mixed dump deposit.

The pottery was examined macroscopically and using a binocular microscope (x 20) where appropriate, and recorded on paper and on the MoLAS Oracle database using standard Museum of London codes for fabrics, forms and decoration. The numerical data comprises sherd count, estimated number of vessels and weight.

10.3.1 Fabrics and forms

Five of the bottles are in English stoneware. Two are ink bottles, one of dwarf shape (cf Green 1999, fig 138, no.410), the other taller and cylindrical (cf ibid, 169, no.412); the latter contains a bright blue residue. Two other bottles with 'Bristol glaze' may also be ink bottles. The smaller, which has a flat-topped rim (cork in situ) is smaller, with a shorter plain neck (cf ibid, no.411; height 73mm, diameter 52mm); it has the number '13' between arched stamps of 'Doulton' and 'Lambeth'. This form may have been introduced before 1865 (ibid, 169). The other is taller and narrower in diameter, with cordoned neck and flat-topped rim (cf ibid, no.408; height 120mm, diameter 50mm); it is stamped 'Doulton, Lambeth' under the number '11'. This form could also have been used for furniture cream of disinfecting powder (cf ibid, 368).

A larger cylindrical bottle with brown salt-glaze and collared rim probably contained blacking (height 155mm, diameter 63mm); it is stamped J Bourne and Son, near Derby, patentees, Denby potteries'. This bottle would have contained annatto, a food colouring/spice (cf the Doulton form illustrated by Green, 1999, 168); similar examples have been found elsewhere in London (N Jeffries pers comm).

The fifth bottle is a near complete German Seltzer bottle used for transporting spa or mineral water (part of the handle is missing). It is stamped 'Konigreichen Preussen' in a roundel at the centre of which is a bird-like stamp stamp (?eagle); under this is the stamp 'Elisabethenbrunnen Homburg'.

10.3.2 Discussion

The Bourne family were the largest produces of stoneware bottles in 19th-century England, the different generations owning several factories; numerous examples have been found in London. William Bourne ran the Belper pottery until 1812, when his son Joseph took over both this factory and that at Denby. I 1834 the Belper pottery ceased to function, as the Denby factory was enlarged and the Codnor Park pottery was taken over by Joseph Bourne in 1833; he was joined in business by his own son by 1841 (Askey 1981, 159–60; 1998, 63, 69–70, 150). This gives a date range of 1832/33–1841 for the Denby bottles, while the fact that they are salt-glazed, rather than liquid glaze might point to a date of 1833–35. Add to this the lack of an excise mark, which was applied to certain types of bottle until 1834, and the bottle could date to 1834–35, although salt glazed bottles were produced in the Derbyshire potteries long after this. This fits with the date of 1835 for the introduction of the 'Bristol glaze' and the date of the discovery of the Elizabethan spring in Bad Homburg, which was on June 27th 1834. Together the pottery and the clay pipe suggest a date in the early 1840s for the group as a whole.

10.3.3 Outstanding work

The post-medieval pottery bottles are of local significance only. Being unstratified the pottery has limited potential for the interpretation of the site, but the group as a whole is photogenic and could be included in a report or article on the excavation.

10.4 Small finds

Beth Richardson

Small finds	5 items (unstratified)

Table 11 Finds and environmental archive general summary

The small finds from Trench PDZ 4.21 (from the uppermost thick, mixed dump deposit) have not been accessioned. They consist of a group of five ?20th century synthetic rubber or resin balls and a mould-made resin object in the form of a conjoined solid sphere and cylinder

10.4.1 Categories by dating and materials

Although unstratified, the objects were found together and have a common or related function. The balls are a similar size, varying in diameter from 42mm to 72mm; two are 50-55mm (one of which has a red surface). The ball from the ball and cylinder has a diameter of 50mm.

They may have had an agricultural or industrial function, eg as ball cocks or valves. With a lot of research it might be possible to identify them, but unless they can be

related to some activity which took place on or near the site it might be advisable to dispose of them, especially as the material from which they are made may deteriorate over time.

If related to activities on or near the site, The finds are possibly of local significance.

Appendix 3: Glossary

Alluvium. Sediment laid down by a river, and usually well-sorted. Can range from sands and gravels deposited by fast flowing water and clays that settle out of suspension during overbank flooding. Other deposits found on a valley floor are usually included in the term alluvium. Peat develops when there is little mineral sediment deposition and impeded drainage, which limits biological decay; and tufa accumulates when springs rich in calcium carbonate discharge in damp well-vegetated situations.

Arctic Beds. Cold climate deposits, pre-dating the Last Glacial Maximum and sometimes found within the gravels of the Lower Lea. They may survive within parts of the floodplain not reworked by the river during the Late Glacial.

Ecotone. A zone that lies between areas of contrasting environment, such as on the wetland/dryland margins.

Holocene. The most recent epoch (part) of the Quaternary, covering the past 10,000 years during which time a warm interglacial climate has existed. Also referred to as the 'Postglacial' and (in Britain) as the 'Flandrian'.

Knickpoint. A fall in base level (such as the low sea level at the end of the Pleistocene) gives rise to a discontinuity in the longitudinal profile of a river ie: steepening of the downstream channel gradient. The river tends to adjust to such a change by increased flow, which leads to increased erosion in the steepened section of the river and this results in the steepened section (knickpoint) cutting back in an upstream direction.

Last Glacial Maximum. The height of the glaciation that took place at the end of the last cold stage, around 18,000 years ago.

Late Glacial. The period following the Last Glacial Maximum and lasting until the climatic warming at the start of the Holocene. In Britain this period is subdivided into a warm 'interstadial' episode the Windermere Interstadial, followed by a renewed cold ('stadial') episode, in which local ice advances occurred (the Loch Lomond Stadial).

Pleistocene. Used in this report to refer to the earliest part of the Quaternary, the period of time until the start of the Holocene, about 10,000 years ago. However, since the present Holocene epoch is almost certainly only a warm interglacial episode within the oscillating climate of the Quaternary, it is often seen as being part of the Pleistocene epoch, in which case the terms Pleistocene and Quaternary are interchangeable. As it is necessary, in this report, to differentiate between the events that took place at various times during the last cold stage and earlier in the Quaternary and those that took place during the Holocene, the Pleistocene is used to refer to the parts of the Quaternary pre-dating the climatic amelioration that took place at the start of the Holocene.

Quaternary. The most recent major sub-division (period) of the geological record, extending from around 2 million years ago to the present day and characterised by climatic oscillations from full glacial to warm episodes, when the temperate was as warm as if not warmer than today. To a large extent human evolution has taken place within the Quaternary period.

Appendix 4: Context index

Context No.	Trench	Plan	Section/ Elevation	Type	Description
1	PDZ4.21		1	Layer	Alluvial clay
2	PDZ4.21		1	Layer	Alluvial clay
3	PDZ4.21		1	Deposit	Natural organic deposit
4	PDZ4.21		1	Deposit	Natural sandy gravel
5	Not used				
6	Not used				
7	Not used				
8	Not used				
9	Not used				
10	Not used				

Context No.	Trench	Plan	Section/ Elevation	Type	Description
11	PDZ4.16			Deposit	19th-20th century industrial waste
12	PDZ4.16			Layer	Alluvial clay
13	PDZ4.16			Deposit	Natural organic deposit
14	PDZ4.16			Deposit	Natural sandy gravel
15	Not used				
16	Not used				
17	Not used				
18	Not used				
19	Not used				
20	Not used				

Context No.	Trench	Plan	Section/ Elevation	Type	Description
21	PDZ4.17			Layer	20th century levelling for present concrete slab
22	PDZ4.17			Fill	Fill of construction cut for culvert [35]
23	PDZ4.17			Cut	Construction cut for culvert [35]
24	PDZ4.17			Fill	Fill of cut [25]
25	PDZ4.17			Cut	Truncation of structure [27]
26	PDZ4.17			Fill	Backfill of timber lined channel [27]
27	PDZ4.17			Structure	Timber lined channel
28	PDZ4.17			Cut	Construction cut for structure [27]
29	PDZ4.17			Deposit	19th century industrial/commercial waste
30	PDZ4.17			Deposit	19th century industrial waste
31	PDZ4.17			Deposit	Re-deposited/disturbed silty clay
32	PDZ4.17			Cut	Construction cut for culvert [35] and/or drain [36]
33	PDZ4.17			Deposit	19th century industrial waste
34	PDZ4.17			Layer	Natural alluvial clay overlying [40]
35	PDZ4.17			Structure	Brick culvert
36	PDZ4.17			Structure	Large cast-iron pipe
37	PDZ4.17	27		Timber	Post from structure [27]
38	PDZ4.17	27		Timber	Post from structure [27]
39	PDZ4.17	27		Timber	Plank from structure [27]
40	PDZ4.17			Deposit	Natural organic deposit overlying [41]
41	PDZ4.17			Deposit	Natural sandy gravel

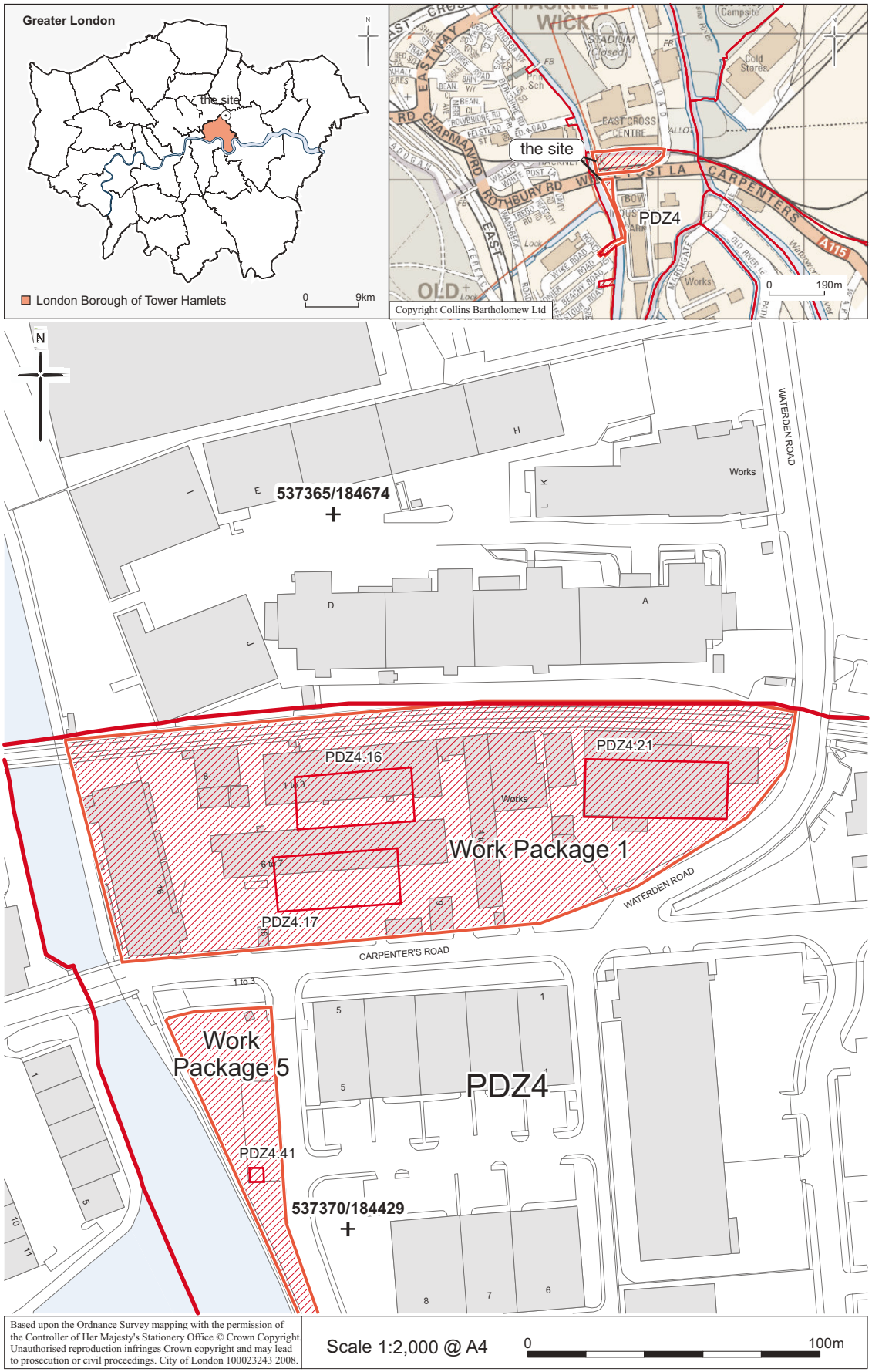

Fig 1 Location map

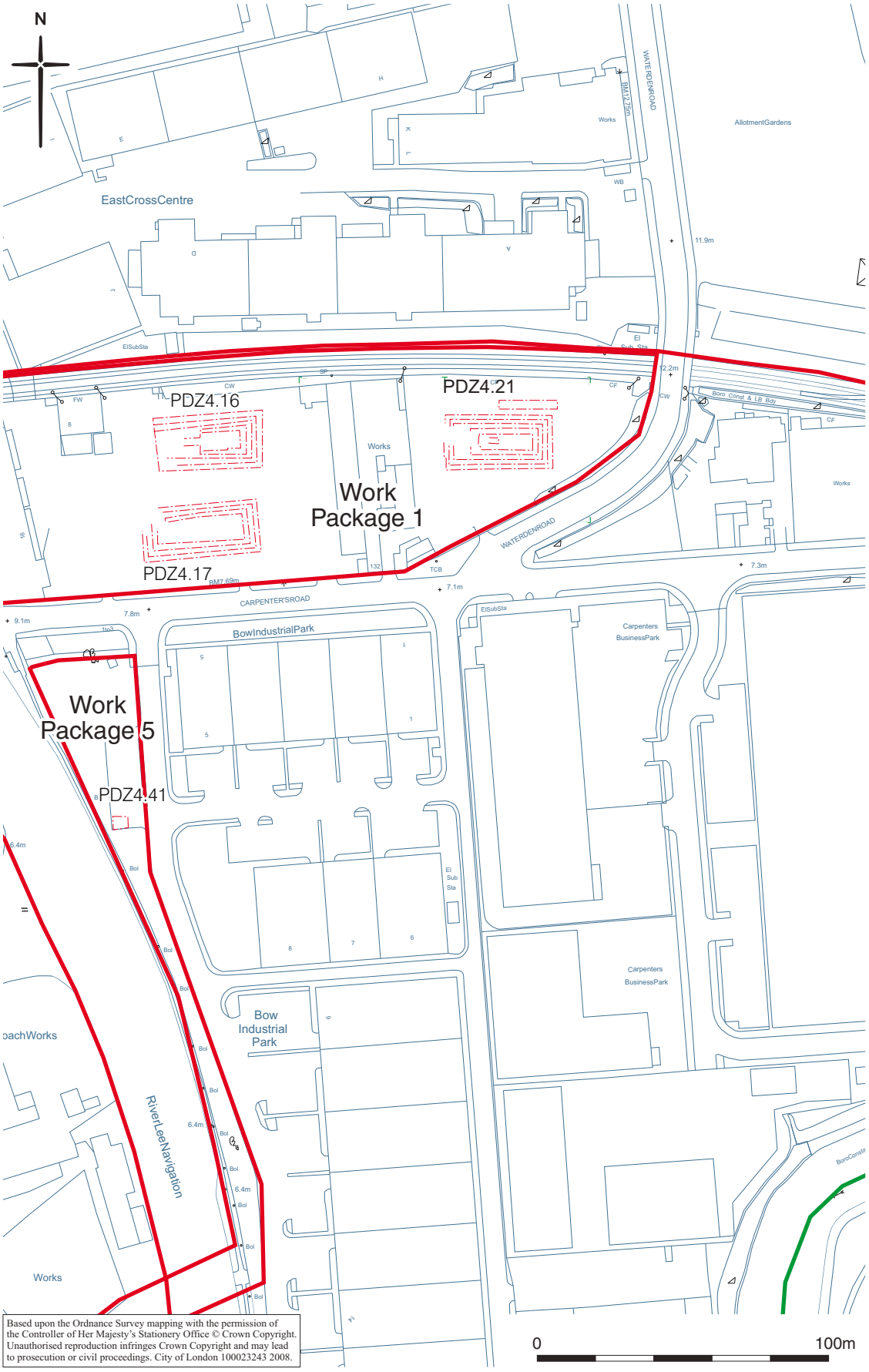

Fig 2 Trench locations

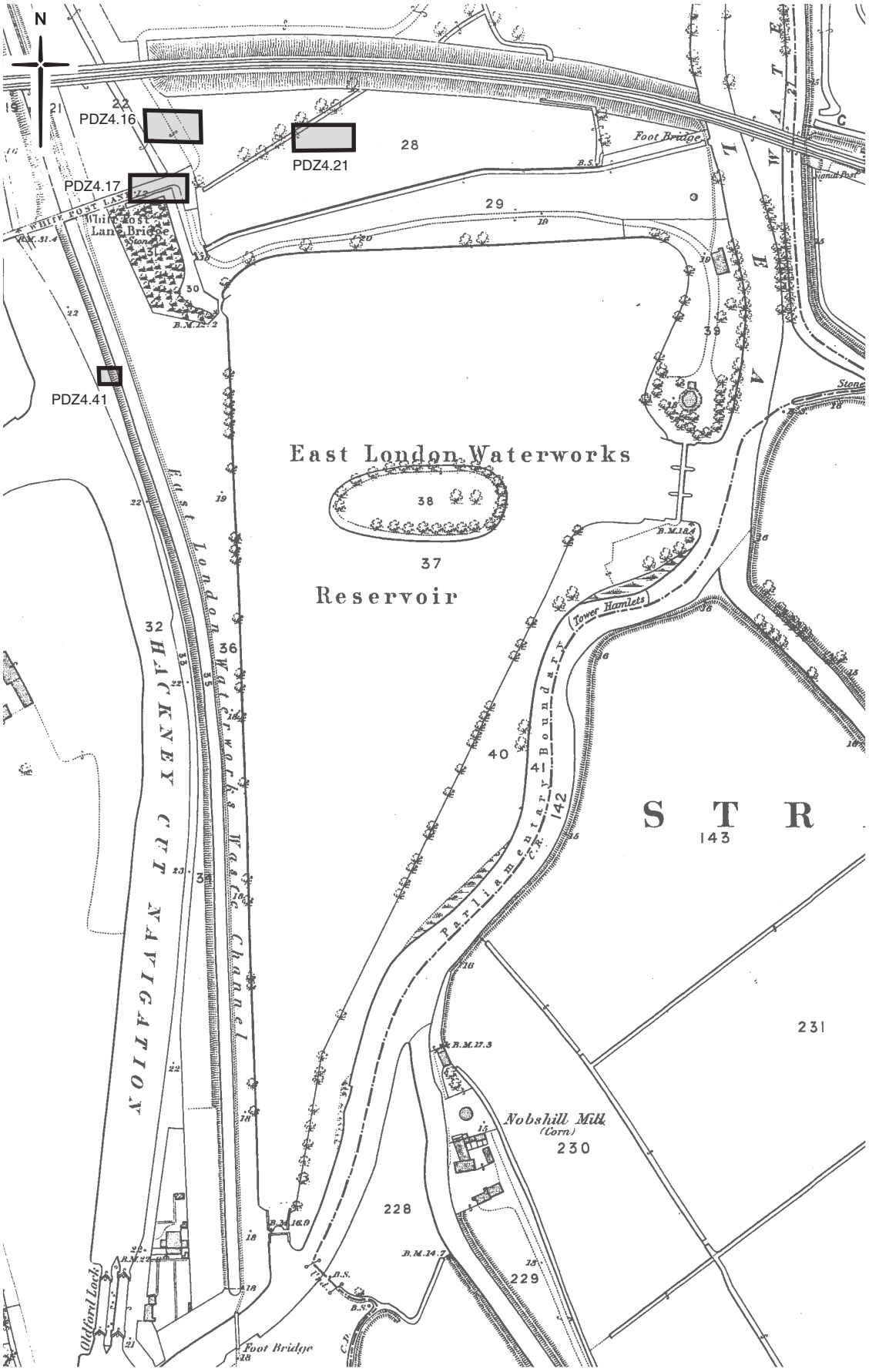

Fig 3 Detail from the 1st edition 1867 OS map of Stratford (15 inches to a mile)

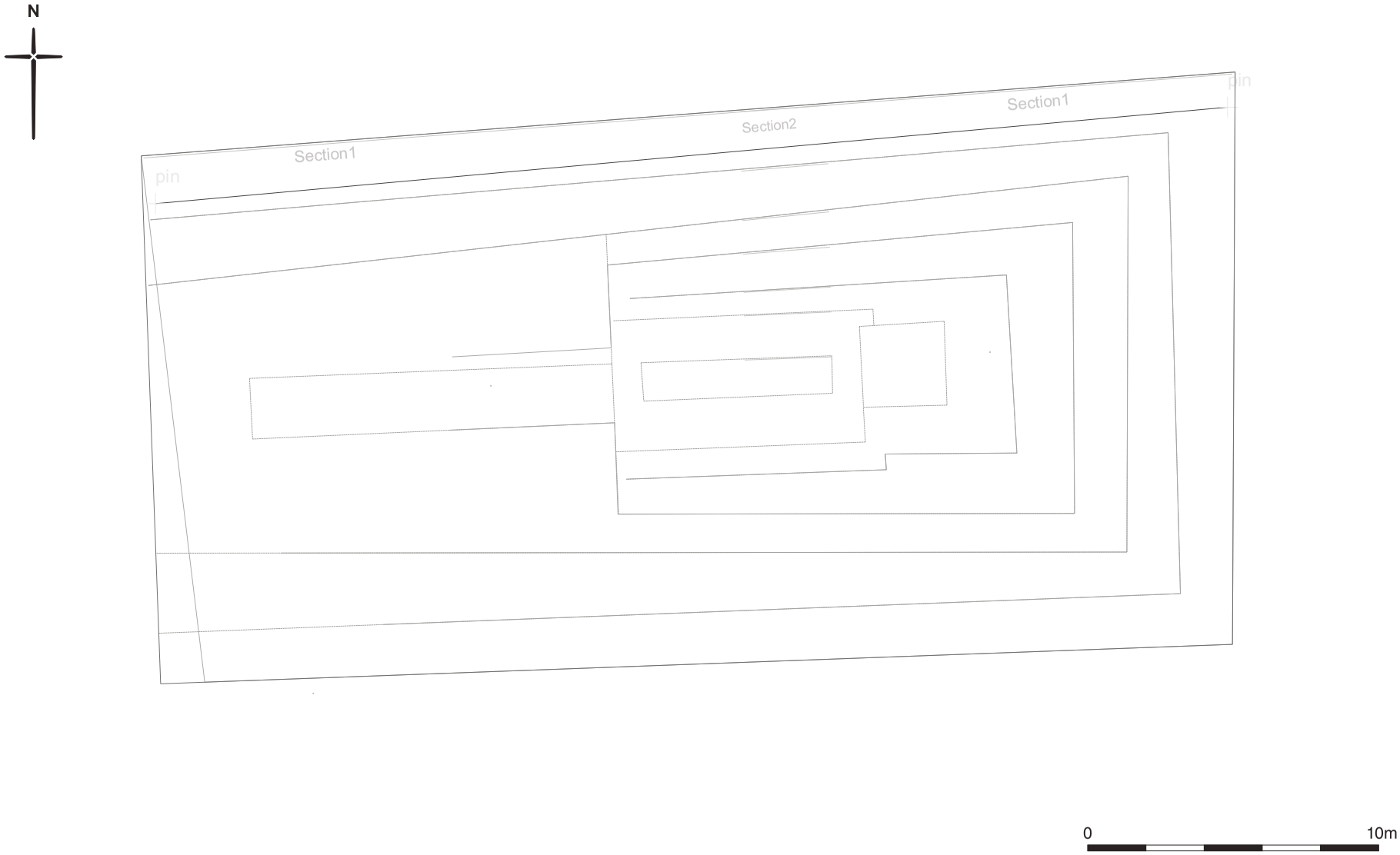

Fig 4 Plan of Trench PDZ4.16

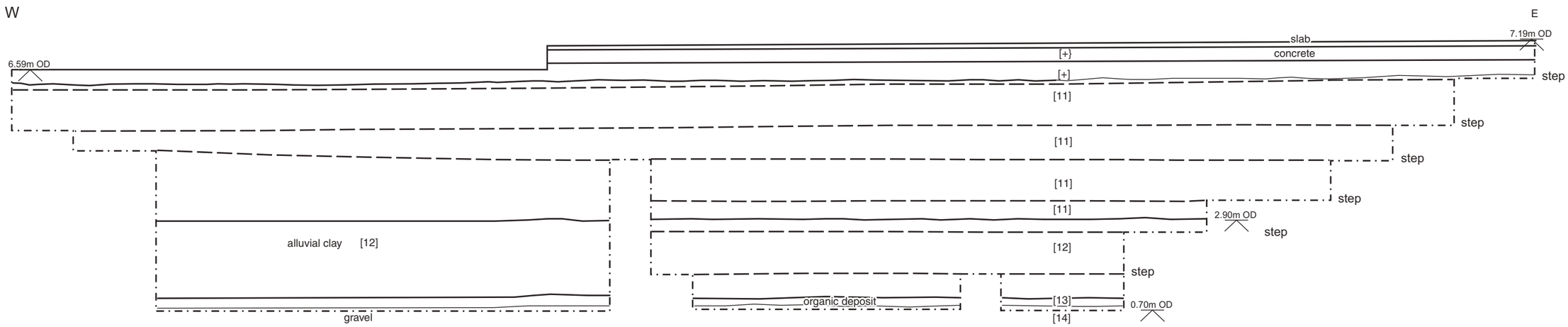

Fig 5 South facing section 1 of Trench PDZ4.16

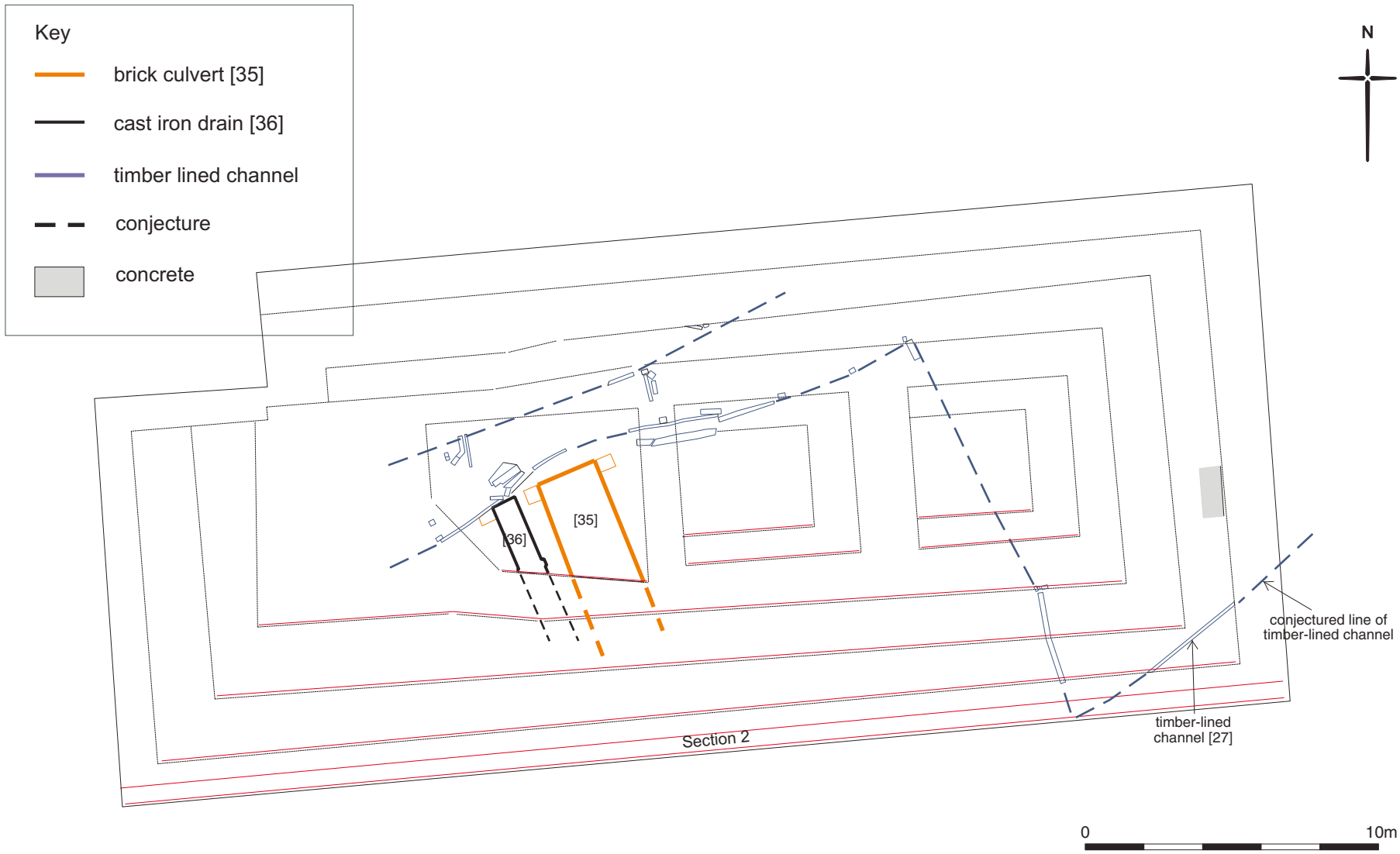

Fig 6 Plan of Trench PDZ4.17

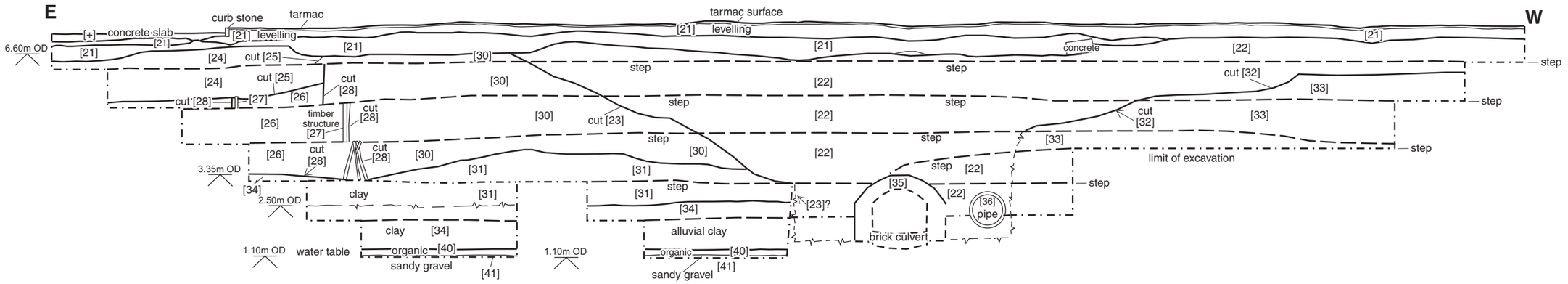

Fig 7 North facing section 2 of Trench PDZ4.17

Fig 8 Photograph of Trench PDZ4.17, looking south and showing timber lined channel and alluvial sequence

Fig 9 Photograph of Trench PDZ4.17, looking south and showing culvert and drain

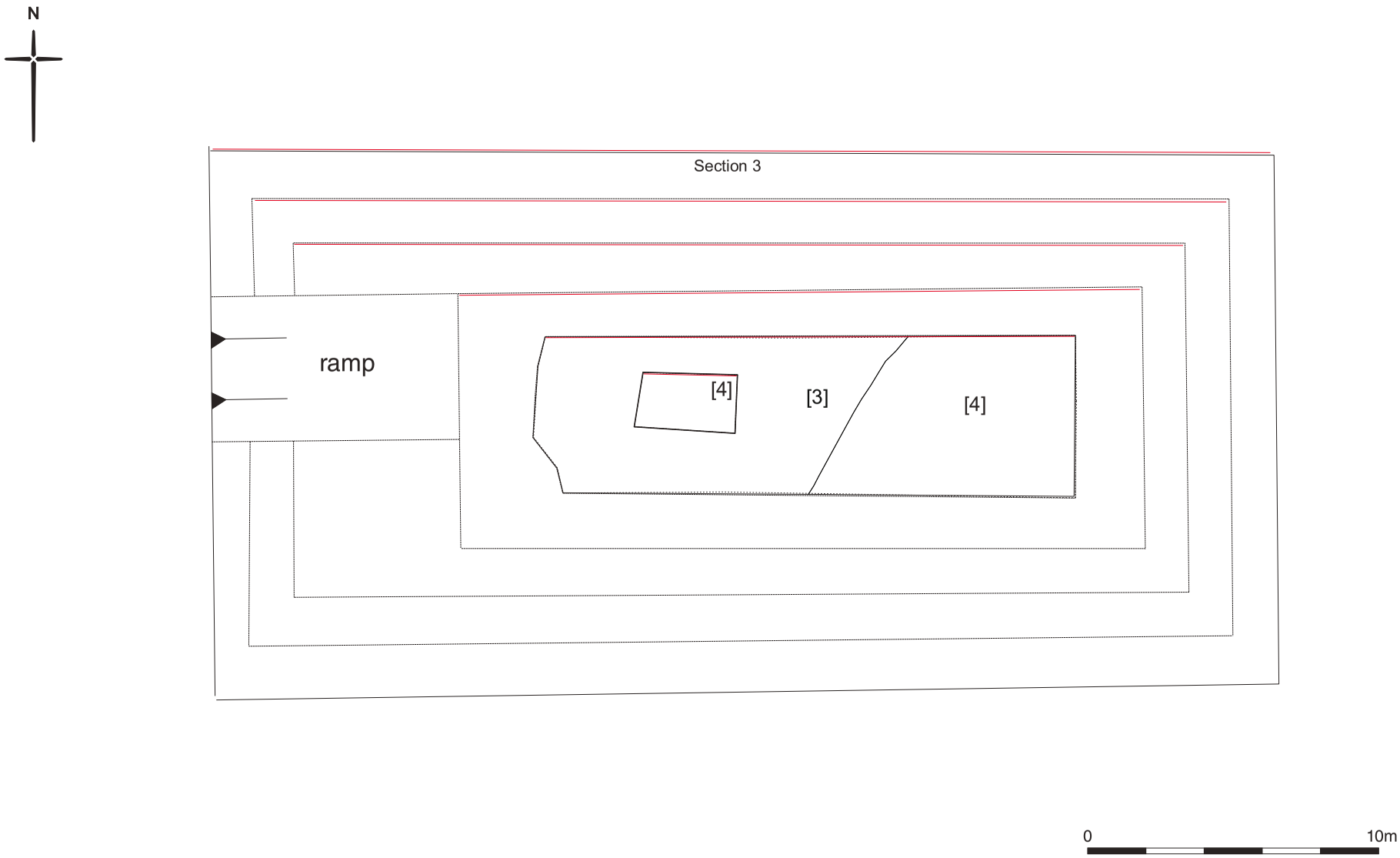

Fig 10 Plan of Trench PDZ4.21

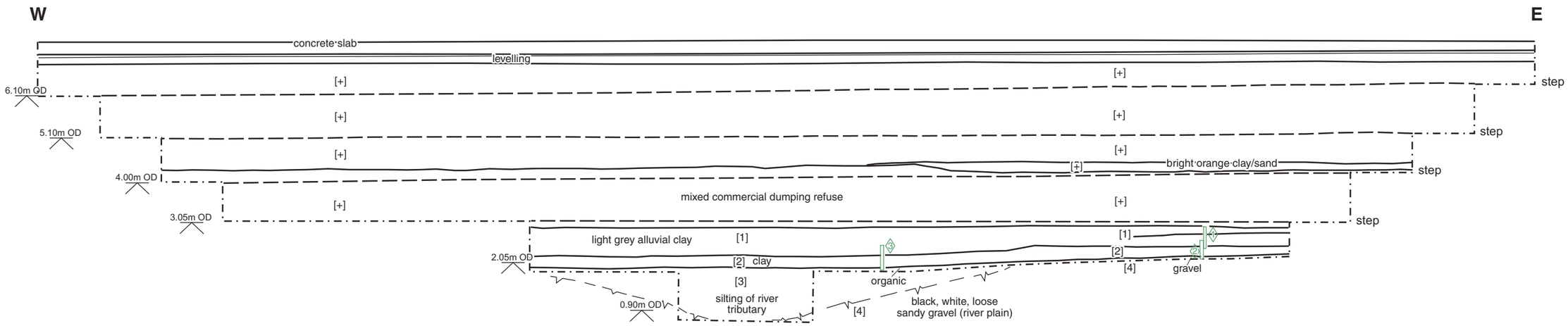

Fig 11 South facing section 3 of Trench PDZ4.21

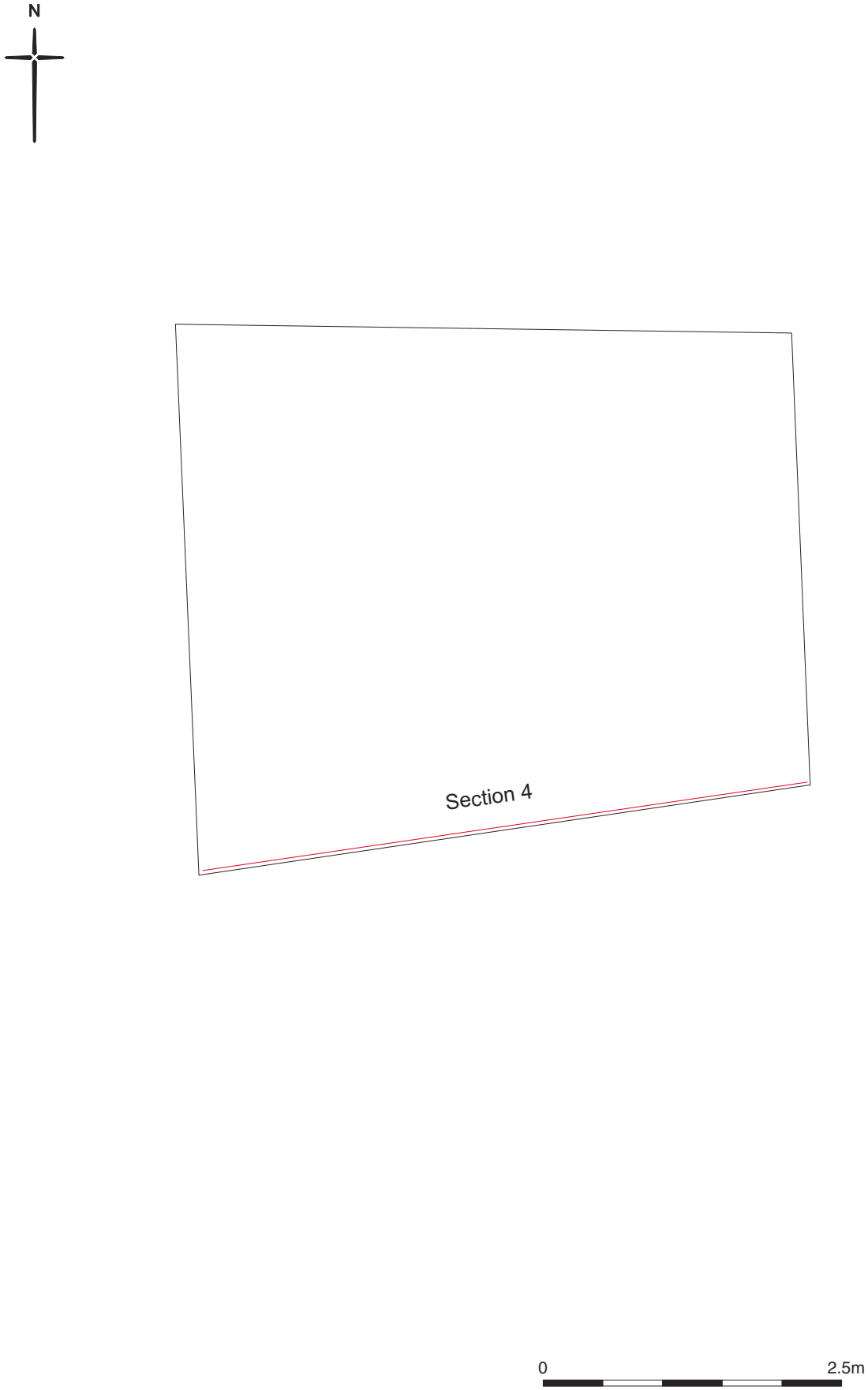

Fig 12 Plan of Trench PDZ4.41

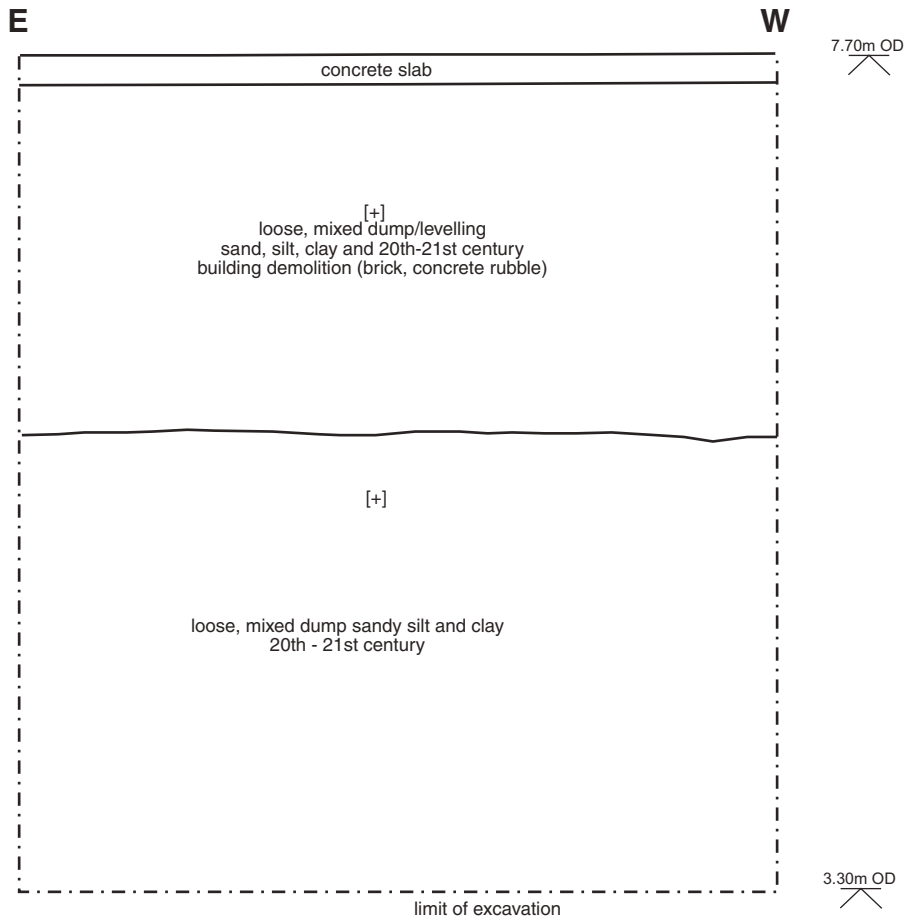

Fig 13 North facing section 4 of Trench PDZ4.41