



PLANNING DELIVERY ZONE 8

Work package 1

Trench PDZ8.01/PDZ5.40 (C)

Trench PDZ8.04/PDZ5.35 (C)

Trench PDZ5.36 (C)

Trench PDZ5.41 (C)

Work package 2

Trench PDZ5.37 (C)

Trench PDZ5.38 (C)

Trench PDZ5.39 (C)

London
E15

London Borough of Newham

An archaeological evaluation report

November 2008



MUSEUM OF LONDON

Archaeology
Service

PRE-CONSTRUCT ARCHAEOLOGY

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Site Code: OL-08807, OL-07807

National Grid Reference: 538040 183670, 537900 183400

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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) within the Olympic, Paralympic and Legacy Transformations Planning Applications: Planning Delivery Zone 8 (Work Packages 1 and 2), London Borough of Newham, London 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 overall Planning Delivery Zone, and subsequent consultation with the Greater London Archaeology Advisory Service, seven evaluation trenches were proposed across PDZ8; four under Work Package 1 (site code OL-08807), and three under Work Package 2 (site code OL-07807). Two of these trenches in Work Package 2 were attempted, but abandoned. Nonetheless, the results have helped to refine the initial assessment of the site's archaeological potential.

The trenches constitute the complete assessment of PDZ8, and as such the findings are presented in a single report. The trenches were examined, where possible, to the level of the natural gravels, which were overlain by alluvial sequences, containing archaeology and evidence about the changing past environment, and sealed by several metres of made ground.

Evidence for a former river channel that crossed the site was recorded in the low elevation of the gravels seen to the north east of site. Fluvial sands and clays were deposited as banks or sand bars against a gravel island to the centre of the site, and recorded in PDZ8.04/5.35. The island was formed of Pleistocene gravels and would have been dry land throughout the prehistoric and much of the historic period. Surrounded by migrating channels and associated wetlands and mudflats, areas of dry ground such as this would have provided abundant resources and a prominent and attractive focus for human activity over long periods of time. This is demonstrated by the prehistoric features of potential Late Bronze Age–Iron Age date that were present within, and cut into, the lower levels of the alluvial sequence in PDZ8.04/5.35.

In several trenches post-medieval features dating from the late 17th century interrupted the historic alluvial sequence. A possible post-medieval relict land surface was also present, indicating a brief period of pastoral land use. The in-situ alluvium in all the trenches was sealed by layers of what appeared to be re-deposited clays or silts, which were overlain by 19th–20th century made ground deposits.

Further information about the characteristics of the nearby watercourses and the associated wetlands and islands might be obtained by examination of environmental micro- and macrofossils preserved in the bulk and monolith samples taken from these deposits. In particular, samples from the extensive peat deposits are of particular value for environmental reconstruction, based upon good preservation of insect and plant assemblages. This suggests that there is also good potential for pollen to be preserved. This environmental data, combined with dates from viable material from the lowest channel or wetland deposits and from possible prehistoric land surfaces, would provide significant information on the development of the channel and its relationship to the floodplain islands and recorded archaeological features.

There is also very good potential for more detailed examination of the trench records to contribute to our understanding of the past topography and evolving environment, by inputting the stratigraphic information into the Olympics geoarchaeological database and modelling the semi interpreted data in ARC GIS.

In the light of revised understanding of the archaeological potential of the site the report concludes that further excavation is unlikely to provide significant additional information about the archaeological remains surviving on the site. It is also proposed that the results of this evaluation are assimilated into a project-wide assessment of all archaeological interventions to assign contextual significance and further refine the importance of the archaeological survival. Thereafter the information gained could be assimilated into any publication discussing/disseminating the results.

The decision on the appropriate archaeological response to the deposits existing on the site rests with the Local Planning Authority and their designated archaeological advisor.

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1 Introduction

1.1 Site background

Archaeological evaluation was undertaken within Planning Delivery Zone 8 (PDZ8), of the Olympic, Paralympic and Legacy Transformations Planning Applications, in the London Borough of Newham.

PDZ8 site is located in an area formerly occupied by light industrial units within the Lower Lea Valley, north of Bow. The Great Eastern main line (formerly the Eastern Counties Railway) forms the north-western border of PDZ8. Stratford High Street, the River Lea and Three Mills Wall River border the south-east, south-west and north-east of the site respectively; the Bow Back River channel bounds the south and the industrial properties of Cook's Road form the south-western boundary. A narrow spur follows the Great Eastern Railway track and embankment to the southwest and is bounded to the south-west by the west bank of the River Lea. The site formerly lay within the ancient parish of West Ham in the county of Essex, prior to being absorbed into the London Borough of Newham.

The evaluation was broken down into a series of Work Packages, each defined due land availability and project programming. These Work Packages (1 and 2) break down as follows (Fig 1):

- Work Package 1: Trenches PDZ5.36(C), PDZ8.01/5.40(C), PDZ8.04/5.35(C) and PDZ5.41(C)
- Work Package 2: Trenches PDZ5.37(C), PDZ5.38(C) and PDZ5.39(C)

Compensation trenches, suffixed with (C) were relocated to PDZ8 from PDZ5 and were similarly undertaken to assess the archaeological potential of PDZ8.

The area covered is hereafter called 'the site'. MoLAS-PCA considers it appropriate to report these trenches together due to the comparatively close location of the trenches.

The OS National Grid Reference for the centre of the centre of Work Package 1 was 538040 183670. The centre of Work Package 2 was 537900 183400.. The footprints of the Work Packages were defined by former local property boundaries, and the limits of areas within which access was possible to excavate the evaluation trenches. Effectively, the footprint of each Work Package was delimited as a tool for defining the location and potential maximum extent of the group of trenches. Current ground level in PDZ1 rises slightly from the centre of site to the north, south and east. Ground level across PDZ8 varied from approximately 4.8m OD in the south and north-west, to 4.3m OD in the north. (see Fig 2).

Attempts at opening trenches PDZ5.37(C) and PDZ5.39(C) were abandoned following water and contamination problems. Similarly trench PDZ5.38(C) had to be aborted after the first stage of excavation as a result of contamination.

Detailed architectural and engineering designs were not available during the reporting phase, but current proposals for PDZ8 comprise construction of Bridges L04 and Underpass U03; both were deemed likely to impact upon the archaeological resource.

Parts of the site will be lowered, and others raised. New roads, services, water supply and drainage will be required. Trench PDZ8.01, combined with trench PDZ5.40(C), was undertaken to assess the proposed location of Bridge L04. Trench PDZ8.04, combined with compensation trench PDZ5.35(C), was originally planned to assess the proposed location of Underpass U03 but had to be relocated for practical reasons.

A desk-based assessment was undertaken for the whole of PDZ8 (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 PDZ8 (MoLAS-PCA 2007b) which forms 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 2007b respectively).

1.3 Planning background

In accordance with local and national policies, archaeological evaluation PDZ8 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 PDZ8 were established in the *Method Statement* for the evaluation (MoLAS-PCA 2007b) and are intended to address the research priorities established in the Museum of London's *A research framework for London Archaeology* (2002).

- What is the potential for Late Glacial environment reconstruction and/or Late Upper Palaeolithic activity in the Pleistocene deposits on the site?
- What evidence exists for past river channels on the site and how does this contribute to our understanding of the origins of the modern and historic River Lea, Waterworks, Pudding Mill and City Mill Rivers?
- Can channel migration be identified in the northeast of the site? How does it compare with the evidence from Carpenters Road and can episodes of channel activity and abandonment be dated?
- What potential is there for reconstructing the evolving river regime from environmental samples taken from the site?
- Is there evidence of past human activity associated with river exploitation or management?
- Is there evidence for past wetland exploitation?
- What environmental evidence suitable for past landscape reconstruction and indirect evidence of past human activity exists within deposits associated with ancient river channels and other wetland areas?
- Does any evidence of prehistoric activity exploiting the higher ground in the northwest and northeast of the site exist?

- Is there any evidence of Roman wetland or dryland occupation and other activity within the area of the site? If so, how does it relate to what is known of the settlement pattern further south in the Stratford Market area during the Roman period?
- What evidence for medieval/post medieval land use exists within the site area, including industrial and agricultural evidence?
- Do remains of the famous Bow porcelain manufactory survive on the site?
- Are there any remains associated with the 12th century river crossing (which currently forms High Street)?
- How extensive is modern truncation and how thick is modern made ground across the site?

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 PDZ8 (MoLAS-PCA 2007a).

2.1 Modern topography and drainage

Planning Delivery Zone 8 is located roughly in the middle of the valley floor of the River Lea, *c* 3km to the north of its confluence with the River Thames. The site covers the south-eastern part of the grid-like network of river channels known as the Bow Back River. It is bounded to the south-west by the River Lea, which is tidal for some distance upstream of the site and to the north-east by the canalised Waterworks River. The Bow Back River flows through the site, close to its south-eastern boundary and the City Mill River crosses the central area. The Pudding Mill River, now culverted, formerly flowed across the site alongside Pudding Mill Lane and other historic channels, now backfilled, also formerly crossed parts of the site.

Modern ground level across the site lies between 4m and 6m OD. The edge of the valley floor, where the ground rises up the valley side onto the river terrace, roughly follows the south-western boundary of the site. The eastern valley side lies *c* 1km to the east of the eastern boundary of the site and is less pronounced than the western side.

The modern topography and drainage of PDZ8 has been much modified by man and bears little resemblance to the landscape of the site in historic and prehistoric times. Modern ground raising has masked the natural land surface by a cover of several metres. Similarly, very little remains in the modern landscape of the natural course of the Lea, which today flows through a series of mostly man-made, canalised and culverted channels, such as those bounding and crossing the site itself.

2.2 Natural topography and past landscape setting

The British Geological Survey (Sheet 256: North London) indicates that the site lies on alluvial sediments. These alluvial deposits would have supported a range of different environments from wetland through to dry land, which are likely to have existed within the Lea valley from the Mesolithic period onwards. These environments would have been constantly changing throughout the Holocene period. Gravels and associated deposits of Palaeolithic date underlie the alluvium. The higher ground of the gravel terrace, which forms the western side of the valley, lies a short distance west of the site, on the opposite side of the River Lea.

Tertiary bedrock, which in this area is variably London Clay and Woolwich and Reading Beds, underlies the gravels. The surface of bedrock delineates the extent of archaeological deposits. Although little archaeological work has previously been undertaken in the local area, excavation in the valley of the Thames and its tributaries suggests that archaeological remains of the prehistoric and earlier historic period are likely to lie within the alluvium

2.3 Prehistoric

Although no prehistoric find or deposits have been recorded within PDZ8 itself, antiquarian findspots show a low level of activity in the form of disassociated finds. However, recent archaeological fieldwork in the immediate vicinity increasingly indicates that the area was occupied and exploited. Neolithic land surfaces and Bronze Age worked wood have been identified in the north of PDZ 1, to the east of the site (site OL-00105). Site OL-00305 in the south of PDZ 1 revealed evidence for an area of slightly higher and therefore drier land which had Bronze Age – Iron Age features, such as post-holes, pits, a ditch and a possible ring gully, cutting through it. A small amount of struck and reworked flint and a large amount of burnt flint was also recovered from the site.

The gravel terraces beside the River Lea and the Low Terrace within the modern floodplain, 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. An evaluation at Blondin Works, 718–720 Wick Lane in 2001, *c* 350m west of the site, uncovered evidence of a dump of carbonised material containing a sherd of Bronze Age pottery and burnt flint. In 2005 an evaluation and subsequent excavation at Construction Site 26 in Warton Road, only *c* 200m north of the site revealed evidence of possible Bronze Age or Iron Age settlement, in the form of post-holes, pits, a ditch and a possible ring gully, along with charcoal, a small amount of struck and reworked flint, and a large quantities of burnt flint. A Late Iron Age or Early Roman ditch and burials have also recently been found immediately east of the site at 40 Warton Road. As noted above, these finds provide a valuable indicator of the archaeological expectation for PDZ8. In the mid 19th century, a Bronze Age spearhead was found by chance beneath Bow Bridge, *c* 60 m south of the site (GLSMR ref no.060922), providing further evidence of activity, possibly in the form of ritual deposition within the river.

2.4 Roman

Most of PDZ8 would have been marshland prone to flooding from the late prehistoric period on, and there may have been a mere, lake or backwater here. It is likely that the varied and valuable river and wetland resources were exploited throughout the late prehistoric and Roman periods. A potential therefore exists for structures such as bridge piers, timber jetties, platforms and revetments associated with stream channels, for example at the western side of the site and in the area of the migrating channel. A Low Terrace and area of higher ground have been identified in the north-eastern and north-western parts of the site (see MoLAS-PCA 2007a, section 3 and Fig 8). Such areas would have provided dry ground suitable for settlement and other activity, probably by those exploiting the wetland resources.

Trackways and droveways may have led across the marsh from the valley side to the Low Terrace. In the former wetland trackways fish traps and even abandoned boats or crannogs might survive. Good preservation by waterlogging means that, in addition to timber structures, archaeological evidence is likely to include organic, wooden and leather artefacts, which are rarely found on dryland sites. In the early 18th century remains of a possible Roman stone causeway were uncovered at a site along Marshgate Lane, although the exact location, survival and significance of the discovery remains uncertain. The Roman road that connected the main port at

Londinium (London) with the early military base and Colony at Camulodunum (Colchester) is projected across PDZ3. There is also a moderate potential for evidence of the Roman crossing point across the Lea. This may have taken the form of a ford or via timber bridges or raised platforms, crossing the braided channels from island to island.

2.5 Saxon

Evidence of Saxon activity in the area is limited to the River Lea and its channels (the Stratford Back Rivers). Prior to reclamation in the later medieval period, the site would have been prone to flooding and largely unsuitable for settlement or cultivation (although the extreme north-west and north-eastern parts may have been dry). The river will have remained a useful resource and by the late Saxon period mills may have been located along the river. There is a moderate possibility that in situ remains associated with management of the streams and banks of this period survive within alluvial deposits.

2.6 Medieval

Although no archaeological evidence for medieval activity comes from within PDZ8, areas to the immediate west were occupied and exploited from at least the 13th century. The rivers within PDZ8 have a moderate potential for medieval deposits and features relating to the mill complexes known to have existed in the area. These features may include timber wharfing and leats set back from the waterfront themselves. Other features might include bridge piers - in particular associated with the new crossing constructed in the 12th century - along with timber jetties and platforms, and trackways and droveways. In the late 18th century, remains associated with the medieval Bow Bridge were revealed in the southern corner of the site. Waterlogged conditions indicate a potential for good preservation of organic, wooden and leather artefacts.

2.7 Post-medieval

In the first half of this period, as in the later medieval period, the Lea valley was a rural area predominantly comprising common pasture and meadow. The River Lea and its channels were however too valuable a resource and were primarily responsible for the subsequent industrial development along the valley. Evidence of past land management and exploitation may survive in former stream channels. There is also potential for isolated structures relating to stream channels. Within PDZ 8 other below ground features relating to the post medieval period are anticipated to include:

- Settlement fronting the High Street with associated gardens/backyards (with probably rubbish pits, cess pits and small-scale industrial activity), as shown on Rocque's 1746 map.
- Three windmills shown in the reclaimed marsh on Rocque's 1746 map.
- The famous Bow porcelain manufactory, which was at the forefront of porcelain manufacturing in England, from 1747 until 1776. Bow porcelain manufactory was established in 1744 to the immediate south of the zone on Stratford High Road. The porcelain manufactory has international significance

and is considered to be of high importance. Remains associated with this site have been excavated by a MoLAS/PCA team in 2007.

- A wide range of industrial activity, mostly of an ‘anti-social’ nature, is indicated on the relevant 18th–20th century maps.

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).

As noted above, seven trenches were proposed (Fig 2):

- Trench PDZ8.01/5.40(C) (Work Package 1)
- Trench PDZ8.04/5.35(C) (Work Package 1)
- Trench PDZ5.36(C) (Work Package 1)
- Trench PDZ5.37(C) (Work Package 2)
- Trench PDZ5.38(C) (Work Package 2)
- Trench PDZ5.39(C) (Work Package 2)
- Trench PDZ5.41(C) (Work Package 1)

The evaluation trenches targeted locations likely to be impacted upon by the proposed development.

The trenches were excavated by a mechanical excavator using a flat ditching bucket, supervised at all times by an archaeologist and a banksman.

Work on Trench PDZ8.01/5.40(C) began in the week ending 29 November September 2007 and was completed 11 January 2008. Trench PDZ8.04/5.35(C) began 28 February 2008 and was completed 2 April. Trench PDZ5.36(C) began 12 November 2007 and was completed 14 December. Trench PDZ5.37(C) began 18 February 2008 and was completed 21 February (repeated excavation was unsuccessful due to a combination of water ingress and ground contamination issues). Trench PDZ5.38(C) began 7 March 2008 and was completed 20 May. Trench PDZ5.39(C) began on 14 April 2008 and was abandoned (it was located on three occasions and was not excavated due to ground conditions in all three cases, and in agreement with English Heritage was abandoned). Trench PDZ5.41(C) began 17 January 2008 and was completed 5 February.

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 WS Atkins 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).

PDZ8 Work Package 1 has produced: 1 trench plan at a scale of 1:50; 3 trench plans at a scale of 1:20; 1 sketch trench plan; 114 context records; 8 sections drawn at a scale of 1:20, and 3 sections at a scale of 1:10. The PDZ8, Wk Pk1 site records will be deposited under the site code OL-08807 in the LAARC.

PDZ8 Work Package 2 has produced: 1 trench plan at a scale of 1:20; 15 context records. The PDZ8, Work Package 2 site records will be deposited under the site code OL-07807 in the LAARC.

Four monolith sequences (twelve tins) were taken from PDZ8, twelve samples for radiocarbon dating and twelve bulk samples. The bulk samples have been partially processed to evaluate their potential and the remaining bulks and tins have been retained in the Olympics sample store until a decision is made on whether they are required for assessment and subsequent analysis.

3.2 Results of the evaluation

3.2.1 OL-08807: Evaluation Trench PDZ8.01/5.40(C)

Location	East of the City Mill River and immediately north of the Greenway.
Dimensions	14.24m x 4.36m at base; 4.37m deep
Modern ground level	4.36m OD
Base of modern fill	1.39m OD
Depth of archaeological deposits seen (alluvium)	1.4m
Level of base of deposits observed and/or base of trench	−0.01m OD
Natural observed	−0.01m OD

Table 1 Trench PDZ8.01/5.40(C) deposit summary

See Fig 3 and Fig 4.

3.2.1.1 Phase 1: Pleistocene Deposits

Natural loose, dark brownish-grey sandy-gravel [62] was encountered across the trench base at −0.01m OD.

3.2.1.2 Phase 2: Active channel and near channel deposits

A layer of soft, chalk-rich, dark brown-grey gravelly clay sand [61] overlay the natural gravels, measuring 0.12m thick at 0.19m OD.

Alluvial layer [60] composed of firm organic clay, overlies context [61]. This measured c 1.5m thick, to a surface of 1.65m OD.

3.2.1.3 Phase 5: Peat formation and channel migration

Context [60] was overlain in turn by a thin peat layer [59]. The peat lay in an isolated layer measuring 2.94m length by 0.22m thick, which was found at 1.69m OD.

3.2.1.4 Phase 6: Historic alluvial deposits

A layer of possibly re-deposited, firm, dark orangey-brown silty clay [56] with inclusions of rope and string intruding from above into this context and the trench base. The layer was encountered at 2.64m OD, measured *c* 1.0m east–west into the limit of excavation, with a thickness of 0.40m. The rope *may* relate to the rope works indicated on site in 19th century sources.

3.2.1.5 Phase 10: 19th and 20th century alluvial redeposition and ground raising

Late post-medieval to modern dumps and made ground layers comprised the remaining trench sequence.

A 0.16m-thick layer of black industrial residues and dumps overlay peat [59]. The dumps were present at 1.29m OD and covered a visible length of 3.94m to the trench limits. Above this was a layer of loosely compacted red tiles with pinkish-white mortar [63]. This deposit measured 0.74m in length by 0.37m thick, and was encountered at 1.66m OD. A layer of firm, mid brownish-grey, coarse sandy-clayey-silt [55] with inclusions of CBM and pottery (see section 12.2.1) overlay both [63] and [56]. This layer extended beyond the limits of excavation, to a thickness of 1.7m, and was encountered at 2.97m OD. Soft, light greyish-yellow, fine sandy-clay [54] overlay the CBM layer at 2.73m OD covering a length of 0.65m and a thickness of 0.07m.

Loose, dark brownish-grey, sandy-silt [53] lay above deposit [54] across the trench width. It measured 0.24m thick at 3.07m OD. This was overlain by a layer of soft, light grey, clayey-silt [52] with inclusions of CBM, present to a surface at 2.92m OD. The next layer was a 0.28m thick deposit of firm mid yellowish-brown clayey-silt [51] containing CBM fragments at 3.17m OD. Above this was a layer of loose dark greyish-brown coarse sandy-silt and glass fragments [50] with inclusions of metal, textile and animal hair. This layer had a thickness of 0.20m encountered at 3.29m OD.

The next layer was composed of firm mid brownish-grey sandy-silt [49], which contained CBM and mortar fragments, and was found at 3.44m OD with a thickness of 0.24m, extending beyond the limits of excavation. Above this was a layer of firm light brownish-grey clay with areas of sand and hardened clay [48]. This had a thickness of 0.32m extending beyond the limits of excavation, and it was encountered at 3.62m OD. Overlying this was a layer of moderately compacted mid greyish-brown sandy-silt [47] that contained CBM fragments, had a thickness of 0.30m, and was encountered at 3.85m OD across the entire the trench.

Firm, light brownish-grey silty-sand [46] overlay the sandy silt layer [47] from a surface of 3.78m OD. Friable to loose, mid-grey and dark blackish-brown slate with silty-sand [45] overlay deposit [46] and measured 0.04m thick. This was overlain by firm, light brownish-grey clay and soft silty-sand [44] measuring 0.07m thick. Above this was a 0.12m thick deposit of mid grey slate [43] with occasional CBM fragments. A layer of light, brownish-grey clay with silty-sand [42] overlay slates [43]. This was encountered at 4.15m OD. Moderately compacted, mid brownish-grey sandy-silt [41] overlay layer [42], which was sealed in turn by a second layer of crushed slate [40], at 4.30m OD. Yellowish-brown sand [39], which contained occasional CBM pieces capped the trench sequence to a surface of 4.36m OD.

3.2.2 OL-08807: Evaluation Trench PDZ8.04/5.35(C)

Location	Parallel to the GER railway viaduct. between City Mill River and Marshgate Lane
Dimensions	21.2m by 2.9m at base; 4.19m deep
Modern ground level	c 4.8m OD
Base of modern fill	3.75m OD
Depth of archaeological deposits seen (alluvium)	1.7m
Level of base of deposits observed and/or base of trench	0.61m OD
Natural observed	1.04m OD

Table 2 Trench PDZ8.04/5.35(C) deposit summary

See Fig 5–Fig 7.

3.2.2.1 Phase 1: Pleistocene deposits

Loose, mid brownish-grey sandy-gravels [114] formed the trench base at 1.04m OD.

3.2.2.2 Phase 3: Dry landsurface development on higher ground and Prehistoric activity

Overlying the gravels was a 0.25m-thick layer of loose, mid bluish-grey clayey-sand with plant roots [113]. This was overlain in turn by a layer of soft mid bluish-yellow sandy-clay [105] that was observed from 1.67m OD. This appears to have formed a prehistoric land surface.

Layer [105] was truncated by several features. East–west ditch [107] traversed the width of the trench, had moderately sloping sides breaking to an irregular base. The ditch measured 1.55m wide by 0.37m deep, from a height of 1.26m OD. Soft, mid blue-grey silty-clay [106] with occasional inclusions of pottery and struck flint filled the ditch. The inclusions indicate a later prehistoric date for the ditch (see section 12).

East–west ditch [110] had concave to slightly vertical sides; a concave base, and measured 1.1m in width by 0.43m depth. The ditch cut into [105] from a height of 1.29m OD. The western terminus of this ditch was present within the centre of the trench. It contained two fills: soft, dark brown clay [109] formed the primary fill, overlain by soft, mid brownish green silty-clay [108].

Posthole [112] measured approximately 0.5m in diameter, by 0.10m depth and had steeply sloping sides breaking to a flat base. Soft mid bluish-grey silty-clay [111] filled the posthole

Soft mid grey-blue sandy-clay layer [104] sealed all three features from a surface of 1.84m OD. The layer contained occasional fragments of pottery and stuck and burnt flints, which date it to the later prehistoric period (see Sections 12.1 and 12.3.1).

Layer [104] was truncated in turn by a sub-rectangular posthole [85] and a possible posthole/pit [89]. Posthole [85] measured 0.56m north–south, by 0.29m east–west, by 0.10m depth. It contained a single fill of soft, mid greyish-green silty-clay with inclusions of struck flint [84]. Posthole/pit [89] was sub circular with near vertical sides; a slightly concave base; measuring 0.42m north–south by 0.46m east–west and

0.12m depth. Soft, mid bluish-brown sandy-clay [88] with inclusions of prehistoric pottery (see section 12.3.1) and struck flints (see 12.1.1) filled the cut.

3.2.2.3 Phase 4: Uncertain prehistoric land use

Four features of currently uncertain date also cut layer [104], these comprised:

- Driven timber stake [82], measuring 85mm by 35mm by 52mm; the stake exhibited possible axe marks. The associated stake hole [83] was circular with a diameter of 0.06m, a depth of 0.05m. Both were encountered at 1.47m OD. Due to machine action it was uncertain where the feature was originally cut from.
- Sub-rectangular pit [81], measuring 0.60m north–south, 1.34m east–west and a 0.27m deep. Soft, mid yellow-grey sandy-silt [80] filled the cut.
- Posthole [87] measured 0.32m in diameter by 0.09m depth and contained a single fill [86] of soft, mid grey-green silty-clay.
- Possible posthole or pit [91] measured 0.48m north–south by 0.50m east–west, by 0.12m depth and contained a single fill of soft, dark blue-greyish-brown clay [90].

3.2.2.4 Phase 6: Historic alluvial deposits

A layer of plastic, mid-dark purplish-brown very organic clay [103] overlay the preceding features across the entire trench, to a surface height of 2.29m OD.

3.2.2.5 Phase 7: Early Post medieval open area activity

Post-medieval ditch [93] cut layer [103], and was orientated north-east/south-west along the trench length. It had sloping straight sides, a slightly concave base, and measured 1.12m in width by 0.12m depth. The ditch was encountered at 1.41m OD. It contained a single fill [92] composed of soft dark brownish-black sandy-clay with inclusions of small mollusc shells and CBM.

3.2.2.6 Phase 8: Post medieval flood events

Alluvial layer [102] sealed [92] across the trench extents. It was composed of soft, light brownish-grey clay with iron mottling associated with rooting, measured an average of 0.40m thickness, and was present at a height of 2.37m OD.

3.2.2.7 Phase 9: Historic buried land surface

Loose, mid-dark greyish-brown clayey-silt [101] with yellow mottling from plant roots, overlay alluvial layer [102]. The clay silt matrix contained inclusions of post-medieval CBM (see 12.2.2). This layer was seen across the entire trench extent, from a surface at 2.54m OD. Preliminary interpretations indicate it represents a relict land surface.

A sequence of post-medieval re-deposited soil dumps overlay alluvium [101]. The earliest comprised friable, mid-brownish-grey sandy-silt with inclusions of CBM [100], measuring 0.40m in thickness. This was sealed by friable mid brownish-grey sandy-clayey-silt [99] with inclusions of pottery and metal measuring 0.64m thick. Overlying this was a layer of friable, mid reddish-brown clayey-silt [98] with a present from 3.70m OD. The final layer was composed of re-deposited loose mid

greyish-brown sandy-silt [97], with inclusions of pottery and CBM, present at 3.92m OD.

3.2.2.8 Phase 10: 19th and 20th century alluvial redeposition and ground raising

Modern made ground deposits capped the trench section. The earliest was comprised of 0.69m of loose dark brownish-grey sandy-silt [96]. This was overlain by loose, mid brownish-yellow sand with gravels [95] and CBM fragments present to 4.59m OD. This formed the levelling deposit for the 0.3m thick concrete slab [94], which sealed the trench to a surface of 4.8m OD.

3.2.3 OL-08807: Evaluation Trench PDZ5.36(C)

Location	Between Marshgate Lane and Pudding Mill Lane, to the south-east of the GER train viaduct
Dimensions	18.5m by 9.75m at trench base; 4.44m deep
Modern ground level	c 4.4m – 4.6m OD
Base of modern fill	2.57m OD
Depth of archaeological deposits seen (alluvium)	2.4m
Level of base of deposits observed and/or base of trench	0.16m OD
Natural observed	0.66m OD

Table 3 Trench PDZ5.36(C) deposit summary

See

Fig 8–Fig 10.

3.2.3.1 Phase 1: Pleistocene Deposits

Loose, fine white gravels within soft grey clay [58], were present towards the trench base at 0.38m OD. This was overlain by a 0.28m thick layer of soft, grey clay with sand, gravels and evidence of rooting and org remains [57].

Both deposits were recorded solely in section within a sondage excavated through the alluvial sequence in the centre of the trench.

3.2.3.2 Phase 2: Active channel and near channel deposits

A layer of firm, dark reddish-brown peat [38] overlies layer [57] from 1.15m OD (Fig 10).

3.2.3.3 Phase 3: Dry landsurface development on higher ground and Prehistoric activity

Beyond the sondage records, the earliest deposit present in the trench base was a layer of natural soft, mid-dark yellow-brown clay and fine sand with occasional small gravel [7] present to a height of 1.17m OD in the northern trench corner.

No stratigraphic relation could be established between the sondage deposits and layer [7].

3.2.3.4 Phase 6: Historic alluvial deposits

Firm, mid reddish-brownish-grey clayey-peat [6] overlay silty clay [7] from 1.81m OD. A 0.3m thick layer of firm, light-mid grey alluvial clay [37] overlay peat [38] (see

Fig 9). These comprise a 0.17m thick layer of firm, light grey alluvial clay [5] observed at the north end of the trench 1.89m OD; a 0.09m thick layer of firm, light grey alluvial clay [8] recorded at 1.79m OD, and a 0.22m layer firm, light grey alluvial clay [21] at 2.01m OD.

In section layer [21] was overlain by soft, light yellow and dark brown alluvial clay with small mollusc shells [22], from a surface of 2.05m OD. This was overlain in turn by a 0.5m thick layer of firm, light greyish-brown alluvial clay [20], containing frequent small mollusc shells and occasional fragments of organic matter.

3.2.3.5 Phase 7: Early Post medieval open area activity

Alluvial clay [20] was cut to the north by [19], which displayed moderately sloping sides and a flat base present from a height of 2.47m OD; the base of the cut lay at 1.41m OD. Firm, mid grey alluvial clay [18] filled cut [19] to a depth of 0.22m. The fill was seen in the base of the cut from c 1.8m OD. Cut [24] was seen only in section, comprising a sharp near vertical side truncating the south edge of [20] from a height of 2.19m OD to 1.49m OD at the base of the section (see

Fig 9).

Neither feature was fully excavated but each was noted as extending beyond the limits of excavation.

No function can be attributed to the features.

3.2.3.6 Phase 8: Post medieval flood events

A 0.6m thick layer of firm, dark bluish-grey alluvial clay [4] containing frequent mollusc shells overlay contexts [18]; [24]; [5] and [8]. This deposit may correspond to the soft mid-dark grey alluvial clay [36] containing mollusc shells that overlay alluvium [37] in the west side of the trench (see Fig 10).

Alluvial clay [36] was overlain by soft, mid greyish-brown silty alluvial clay [35]. This layer contained chalk fragments, flint pebbles, and fine CBM fragments, and was present from at 1.62m OD.

This was overlain in turn by a layer of soft mid grey alluvial clay [34] containing chalk fragments, flint pebbles, and CBM pieces from a surface of 1.98m OD.

3.2.3.7 Phase 10: 19th and 20th century alluvial redeposition and ground raising

Two layers of re-deposited alluvial clay [17] and [23] overlay alluvial clay [4]. Both were firm, mid [17] or light [23] grey and contained small mollusc shells. Layer [17] was present at 2.27m OD and measured *c* 0.4m in thickness, while layer [23] was encountered at 2.59m OD with a thickness of 0.6m.

3.2.3.8 Phase 11: 19th and 20th century alluvial redeposition and ground raising

A series of post-medieval (19th to 20th century) made ground deposits formed the most recent deposits within the trench. The earliest overlay alluvium [4] and comprised firm, light grey clay mixed with dark brownish-grey silt [11] containing CBM, and measured 0.11m thick. A 0.45m thick dump layer of moderately compacted dark grey clayey-silt and rubble [16], containing CBM and chalk fragments OD was recorded in section directly above layer [17]. This was overlain at 3.00m OD by a layer of firm, light brownish-grey clay [15] containing CBM that. Above this was a layer of soft, whitish-grey clayey-silt [32] containing charcoal and CBM, measuring 0.16m thick. This was overlain in turn by a layer of loose mid grey silty-sand with rubble [14], with inclusions of slate, CBM and stones, which was encountered at 3.02m OD.

3.2.4 OL-08807: Evaluation Trench PDZ5.41(C)

Location	At the south-eastern corner of Trench PDZ5.36(C), parallel with and between Marshgate Lane and Pudding Mill Lane; south of GER railway.
Dimensions	30.00m by 8.25m at base; 4.19m deep
Modern ground level	4.39m OD (based on datum)
Base of modern fill	1.93m OD
Depth of archaeological deposits seen (alluvium)	1.7m
Level of base of deposits observed and/or base of trench	0.20m OD
Natural observed	NA

Table 4 Trench PDZ5.41(C) deposit summary

See

Fig 11 and

Fig 12.

3.2.4.1 Phase 1: Pleistocene Deposits

Soft, light greyish-yellow silty-gravel and sand [77] with bands of peat and shell fragments to the top was encountered at 0.70m OD.

3.2.4.2 Phase 2: Active channel and near channel deposits

Overlying this was a layer of soft dark brown silty-clay [79] that was 0.50m thick and encountered at 1.20m OD.

3.2.4.3 Phase 5: Peat formation and channel migration

Above context [79] was a 0.20m thick layer very soft of light grey silty-sand [78]. All three contexts were recorded in section in the sondage carried out against the western side of the trench (see

Fig 11 and

Fig 12).

A layer of peat [68] containing coarse fragments of organic material and small mollusc shells sealed silty sand [78], from 1.43m OD.

3.2.4.4 Phase 6: Historic alluvial deposits

Peat layer [68] was overlain by firm, light blue-grey alluvial clay [67]. The alluvium was noticeably thick at 1.02m and formed the northern trench base.

3.2.4.5 Phase 7: Early Post medieval open area activity

Post-medieval ditch [73] truncated alluvial layer [67]. The ditch was oriented north-east to south-west; concave sides; flat base and measured 1.64m width by 1.01m depth. The ditch was cut from 2.78m OD. The ditch fill comprised soft, dark greyish-black silt [74] (excavated as [75] and [76] in two sample slots) that contained small mollusc shells and occasional clay tobacco pipe fragments dating to 1680–1710 (see 12.4.1).

3.2.4.6 Phase 10: 19th and 20th century alluvial redeposition and ground raising

A 0.90m thick layer of firm, dark greyish-blue re-deposited clayey-silt [66] sealed ditch [73].

3.2.4.7 Phase 11: 19th and 20th century alluvial redeposition and ground raising

Two features cut layer [66] in section (see

Fig 12): pit [69] measured 1.26m deep, by 2.30m wide, cut from 3.13m OD. It contained a single fill of soft light brown silty-clay with occasional CBM [70]. Construction cut [71] had near vertical sides, a flat base, and measured 2.40m in length by 1.00m deep, present at 3.12m OD. The fill a soft light brown silty-clay containing CBM fragments [72] supporting a substantial a concrete block (possibly a ground beam fragment). Both features were sealed by a modern dump layer [65], which capped the trench

3.2.5 OL-07807: Evaluation Trench PDZ5.37(C)

Attempts to open the trench proved unsuccessful due to a combination of water ingress and ground contamination issues; the excavation of the trench was eventually abandoned and no records were produced.

3.2.6 OL-07807: Evaluation Trench PDZ5.38(C)

Location	Southwest of Pudding Mill Lane, north of the Bow Back River.
Dimensions	30.0m by 8.0m at base; 5.0m deep (including auguring)
Modern ground level	4.79m OD
Base of modern fill	2.05m OD
Depth of archaeological deposits seen (including alluvium)	2.2
Level of base of deposits observed and/or base of trench	−0.21m OD
Natural observed	0.29m OD

Table 5 Trench PDZ5.38(C) deposit summary

See Fig 13.

3.2.6.1 Phase 1: Pleistocene Deposits

The earliest deposits observed within the trench were gained by geoarchaeological auger.

Sandy-gravels [15] were present at 0.29m OD, which formed the limit of investigation.

3.2.6.2 Phase 3: Dry landsurface development on higher ground and Prehistoric activity

The gravels were overlain by a layer of bluish-grey to greenish-brown sandy-silt to fine sand [14] encountered at 0.52m OD.

Above this was a layer of dark blue-grey silty-clay [13] that became sandier towards its base, the silt clay was recorded at 1.05m OD.

3.2.6.3 Phase 5: Peat formation and channel migration

The above deposits were overlain by a layer of mid brown humic silty-clay [12] that had a higher concentration of peat towards the surface of the deposit. This measured 0.33m thick.

3.2.6.4 Phase 7: Early Post medieval open area activity

An oval, post-medieval pit [3] truncated layer [11]. The pit had steep sides breaking to a flat base; measured 1.19m north-east–south-west by 1.08 north-west–south-east by and 0.07m deep. The pit was seen in plan at 1.20m OD. Soft, mid blackish-brown

sandy-silt [4], containing fragments of CBM, pottery, glass and bone (see Appendix 4: Finds assessment).

Ditch [1] cut across the pit along a north-east–south-west orientation. The ditch had with even sloping sides breaking to a flat base, and measured 2.98m in width, by 0.59m depth. The ditch survived to 2.05m OD. Two sample slots were excavated through the ditch to record the characteristics of the ditch and fill, and to recover dating evidence. The southern slot contained two fills: a primary fill of friable, dark greyish-brown sandy-silt [10], containing worked stone blocks; CBM; animal bone and clay tobacco pipe (see Appendix 4: Finds assessment); and a secondary fill of loose dark brownish-grey sandy-gravel [9] containing CBM and pottery fragments. The northern ditch slot revealed a single fill of soft, mid blackish-brown sandy-silt [2] containing pottery fragments (see 12.3.2). Fills [9] and [2] represent the same deposit.

A construction cut [6], containing a driven post-medieval timber stake [5], truncated the north-eastern edge of ditch [1]. The cut measured 0.55m by 0.36m width and 0.28m deep. The stake [5] was set on a vertical axis and measured 0.67m by 90mm by 80mm, and survived above the trench base to 2.08m OD. The darkened appearance of the timber suggests an element of staining or similar treatment. The cut was backfilled with soft mid greyish-brown sandy-silt [7] with large pieces of CBM used to support the stake [5].

3.2.6.5 Phases 10 and 11: 19th and 20th century alluvial redeposition and ground raising

A 3.36m thick layer of post-medieval to modern made ground [8] sealed the features across the full extent of the trench. This layer was mostly composed of dark blackish-grey soft silt with lenses of firm, mid orange, or white, clay or loose sand. As a layer the deposits contained inclusions of CBM, clay pipe, wood, and concrete. The dumps capped the sequence to the surface of the trench at 4.80m OD

3.2.7 OL-07807: Evaluation Trench PDZ5.39(C)

Three attempts were made to undertake the trench in various locations within PDZ8, these attempts proved impossible as a suitable location was severely limited due to water and ground contamination hazards. The excavation of the trench was abandoned with no records being produced.

3.3 Stratigraphic interpretation of the site

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

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

3.3.1 Phase 1: Pleistocene Deposits

<i>Trench</i>	<i>Contexts</i>	<i>Samples</i>
PDZ8.01/5.40(C)	[62]	—

PDZ8.04/5.35(C)	[114]	–
PDZ5.36(C)	[58]	–
PDZ5.41(C)	[77]	–
PDZ5.38(C)	[15]	–

Table 6 Buried topography index

Sand and gravel deposits were recorded at the base of the trenches between 1.04m OD in Trench PDZ8.04/5.35(C) falling to –0.01 in PDZ8.01/5.40(C). This corresponds to the topography of the prehistoric landscape, as proposed in the Detailed Desk Based Assessment (DDBA) (MoLAS-PCA 2007a). The depth of gravels in PDZ8.01/5.40(C) indicates a nearby channel to the east of the site while the evaluation trench PDZ8.04/5.35(C) within the central area of the site appears to lie upon a possible island of higher ground, likely to have been dryer ground in prehistory, with potential for evidence of prehistoric occupation activity.

It was proposed in the DDBA that such islands may represent remnants of the late Pleistocene floodplain that were not removed by late glacial melt-water. The gravels are probably of a Pleistocene date and a result of glacial meltwater, although in places it is likely that the Pleistocene gravels were reworked by Holocene rivers. Inadequate observation was made of the gravels encountered in the trench to be confident about their date or environment of deposition, however.

3.3.2 Phase 2: Active channel and near channel deposits

<i>Trench</i>	<i>Contexts</i>	<i>Samples</i>
PDZ8.01/5.40(C)	[61]; [60];	{13}
PDZ5.36(C)	[38];	{2}
PDZ5.41(C)	[79];	{26}

Table 7 Index of Active channel and near channel wetlands contexts

Evidence for flowing water and active channels was recorded above the gravels in a number of trenches. Contexts [7], [105] and [113] are fluvial deposits relating to the formation of bars of banks on the rivers edge or on high elevations of gravel, as part of flood events. Their date is as yet uncertain. However, they will be discussed in the section below in order to relate their stabilisation to the gravel island and human activity associated with it. In PDZ 5.41 a thin deposit of brown mollusc rich silty sand (context [79]), was also most likely laid down by channel margin or slow flowing channel processes.

Trench PDZ8.01/5.40(C) contains the lowest elevation of gravels, at 0.01m OD, seen on site. Above these low lying deposits is a thin layer of organic gravely clayey sand (context [61]) that may represent the edge of an active channel lying to the south east against the gravel terrace. Organic silty clay deposits (context [60]) recorded within the channel in PDZ8.01/5.40(C) to the east of the site are likely to represent the silting up and migration of a watercourse and the development of wetland or intertidal mudflat environments. These deposits are likely to be contemporary with the dry landsurface (Phase 3).

Similar deposits ([38]) were recorded above the lowest evidence of Holocene soil formation in the top of the gravels ([57]). This is likely to represent the encroachment of wetland conditions across previously dry landsurfaces in the lower-lying parts of

the site, to the west of the gravel island and elsewhere and therefore post date some parts of Phase 3. These deposits were recorded between *c* 1.65m and 1.15m 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.

3.3.3 Phase 3: Dry landsurface development on higher ground and Prehistoric activity

<i>Trench</i>	<i>Contexts</i>	<i>Samples</i>
PDZ8.04/5.35(C)	[113]; [105]; [84]; [85]; [88]; [89]; [104]; [106]–[112];	{26}; {27} {28}; {29};
PDZ5.36(C)	[57]; [7];	–
PDZ5.38(C)	[14]; [13];	–

Table 8 Index of prehistoric activity contexts

Soil development at the surface of the gravels was inferred from deposit characteristics, together with evidence of fine rooting and some organic preservation. Evidence for soil development or potentially dry landsurfaces was noted even in slightly low lying areas of the site, such as context [57]) with a surface elevation of 0.66m OD. Geoarchaeological samples were collected from a number of these possible landsurface deposits that may yield information. These soils are likely to be concurrent with the deposition of channel and wetland deposits, described in phase 2 above, but relating to the higher areas of the floodplain.

Although the landsurface [57] was sealed by organic deposits [38] representing an increasingly wet environment, in the east of trench (PDZ5.36), elsewhere context [57] was overlain by yellow brown clays and sands to about 1.17m OD (context [7]). The high sand content of these deposits indicate higher energy processes, which suggests that these deposits are channel bars or banks that have accumulated against the nearby gravel island. Similar deposits (contexts [113] and [105]), albeit less sandy and therefore further from the channel and with a greater alluvial component, lie directly upon the high elevation of gravel with a surface at around 1.67m OD and may result from occasional flood events. The yellow colouring and orange mottling of these deposits indicates oxidation and exposure to the surface, along with signs of rooting and stabilisation.

Thus, the sequences suggest the encroachment of active watercourses across previously dry ground and subsequently their drying out and colonisation by vegetation. These events are likely to be of earlier prehistoric date as the deposits were cut by Bronze age features.

Trench PDZ8.04/5.35 was the only trench in which prehistoric (Late Bronze Age–Iron Age) cultural evidence was observed. The activity is characterised by ditches; pits and /or postholes. Dating was provided by fragments of pottery present either in the feature fills or re-deposited in the surrounding alluvial layers (see 12.3.2). These features cut into the stable dryland surface (context [105]) that formed upon the high elevation of gravel highlighted in this trench (PDZ8.04/5.35). Context [105] and the features cut into it were sealed by a grey blue slightly sandy clay with a surface

elevation of 1.84m OD. This context was also cut by prehistoric features. This suggests multi phases of human activity as alluvial and higher energy deposits encroached on the island. Islands with surfaces at elevations such of this would have been essentially dry up to the Roman period, surrounded by wetland they would be a potential focus point for human activity from the Mesolithic onwards.

PDZ5.38 lies to the south-west of site and close to another high elevation of gravel as highlighted in the DDBA (MoLAS-PCA 2007a). The deposits overlying the gravel, from surface elevation of 1.05m OD, are not oxidised and only the sediments directly above the gravel contain the sand component like those discussed above (context [14]). Instead they are predominantly blue grey silts and clays they are apparent as alluvial overbank flood deposits (PDZ5.38, context [13]). These deposits are not as waterlogged as the organic clays and silts highlighted in phase 1 but also do not show the signs of oxidation and soil development seen in contexts [7] and [105]. This deposit may have developed close to the second high gravel island previously identified but not close enough to be dry enough to stabilize, the deposit could also reflect increased distance from a channel.

3.3.4 Phase 4: Uncertain prehistoric land use

<i>Trench</i>	<i>Contexts</i>	<i>Samples</i>
PDZ8.04/5.35(C)	[80]–[83]; [86]; [87]; [90]; [91]	–

Table 9 Index of site prehistoric land use

Features within this phase failed to yield any datable evidence. As with the prehistoric features above, this phase was only seen within trench PDZ8.04/5.35(C). It is likely that the features also date to the later prehistoric period on stratigraphic grounds.

3.3.5 Phase 5: Peat formation and channel migration

<i>Trench</i>	<i>Contexts</i>	<i>Samples</i>
PDZ8.01/5.40(C)	[59]	{12}
PDZ5.41(C)	[78]; [68]	{23}; {20}
PDZ5.38(C)	[12]	–

Table 10 Index of peat formation contexts

Peat (contexts [12], [68] and [59]) overlay the phase 2 active and abandoned channel deposits and organic clays, between 1.43 and 1.69m OD in a number of trenches (PDZ5.38, PDZ5.41 and PDZ8.01/5.40). This represents a further stage of drying out of the river channels and the development of more stabilised marsh of wet woodland environments. The date of these deposits might vary across the site, as drier conditions progressively encroached across the former channel and backwater environments.

Such deposits provide valuable information in regards to the past landscape, both via the knowledge of the manner of their deposition and through their potential in the excellent preservation of organic remains that can be used for environmental reconstruction and dating. More information about the environment represented by these contexts and their date might be obtained from the samples taken from them, which preserved a diverse assemblage of wetland plant remains as well as occasional ostracods.

3.3.6 Phase 6: Historic alluvial deposits

<i>Trench</i>	<i>Contexts</i>	<i>Samples</i>
PDZ81/5.40(C)	[56]	—
PDZ8.04/5.35(C)	[103]	—
PDZ5.36(C)	[5] – [8]; [20] – [21]; [37];	{3}
PDZ5.41(C)	[67]	{19}

Table 11 Index of historic alluvial contexts

Above roughly 1.5m OD the alluvial deposits in these trenches comprise predominantly clay, typically minerogenic (i.e. non peaty). Its characteristics vary laterally and through time and although difficult to differentiate from on-site observation of the deposits it is likely to represent a range of different depositional environments.

In PDZ5.41 the thickest deposits of this clay was found ([67]). It is likely to have accumulated through temporary episodes of flooding of an otherwise dry landsurface with poor preservation of organic remains, as samples taken from it preserved relatively few seeds. It is probably late prehistoric to post medieval or more recent in date.

Similar deposits survive in PDZ5.36 but to a lesser extent (contexts [5], [8], [21], [22], [20], and [4]).

The deposits in PDZ5.36 vary in composition and colour and the presence of molluscan remains may indicate a slightly different depositional environment and changing proximity to active channels.

The alluvial deposits within PDZ5.38 and PDZ8.01/5.40 (contexts [11] and [56]) show a variable but higher organic content, which may reflect more waterlogged conditions in these areas of the floodplain. Relatively thin deposits of alluvium exist in PDZ8.04/5.35 (context [103]) and may be due to the high elevation of the gravel island that is present in this area, making it less susceptible flood episodes. However, context [103] is a very organic and peaty clay suggesting that the previously dry ground in this area was becoming increasingly waterlogged much like the deposits in PDZ5.38 and PDZ8.01/5.40 (contexts [11] and [56]). A better understanding of these alluvial clay deposits would contribute to reconstructions of the historic environment of the site (which is likely to have varied between mudflats, saltmarsh and open wet grassland both laterally and through time).

3.3.7 Phase 7: Early Post medieval open area activity

<i>Trench</i>	<i>Contexts</i>	<i>Samples</i>
PDZ8.04/5.35(C)	[92]; [93]	{27}
PDZ5.36(C)	[18]; [19]; [24]	—
PDZ5.41(C)	[73]–[76]	—

Table 12 Index of post medieval contexts truncating historic alluvium

Several features cut through the natural deposits of phase 6. Two of these were post-medieval ditches: [93] and [73], the latter dated by fragments of tobacco pipe and CBM to c 1680–1710. The two cuts [19] and [24] were of uncertain function or date, but likely to be post-medieval based on stratigraphic relationships.

These features represent the first evidence of post-prehistoric cultural activity, a likely indication of the land of the floodplain becoming more attractive to past peoples and possibly a more stable environment.

Evidence of human manipulation of this environment and evidence that these areas were still waterlogged to some degree is apparent from the digging of drainage ditches such as [73] and [93].

3.3.8 Phase 8: Post medieval flood events

<i>Trench</i>	<i>Contexts</i>	<i>Samples</i>
PDZ8.04/5.35(C)	[102]	—
PDZ5.36(C)	[4]; [34]–[36]	{3}; {8}

Table 13 Index of post medieval flood contexts

Further lenses of alluvial material sealed the features of phase 7 in trenches PDZ8.04/5.35(C) and PDZ5.36(C). This demonstrates that at least part of PDZ8 was prone to flooding during the post-medieval period.

3.3.9 Phase 9: Historic buried land surface

<i>Trench</i>	<i>Contexts</i>	<i>Samples</i>
PDZ8.04/5.35(C)	[101]	—

Table 14 Index of buried land surface contexts

A brief period of dry soil formation was indicated by mid–dark, greyish-brown clayey-silt [101] in trench PDZ8.04/5.35(C). This indicates the likely pastoral use of the area surrounding the trench prior to the land raising deposits of the late 18th–20th century.

3.3.10 Phases 10 and 11: 19th and 20th century alluvial redeposition and ground raising

Layers of re-deposited alluvium were observed within all of the trenches. These show the initial stages of ground raising prior to the final deposition of made ground which formed the local topography into the 21st century; the alluvium may have been deposited as a result of the various episodes of canal and waterway construction throughout this period.

3.4 Evaluation of environmental evidence

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 trenches. 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, is difficult to interpret reliably on a trench by trench basis. These profiles 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

Multiple sequences of monolith tins (12 tins, samples {1}, {15}, {18} and {25}) were taken across the site and a series of bulk samples {2}, {3}, {12}, {13}, {14}, {19}, {20}, {23}, {26}, {27}, {28}, and {29} were also taken adjacent to the monolith tins. Half of each bulk sample has been processed and evaluated and the results are summarised in this report. The unprocessed half of each bulk sample and the monolith tins will be held in the MoLAS-PCA Olympics store until a decision has been made on whether they are required for assessment and/or analysis.

The tins provide an undisturbed column of sediment through the alluvial deposits, for off-site examination. The location selected for sampling was considered to be a representative profile of the alluvial deposits exposed in each trench. The monoliths are suitable for sub-sampling for microfossils and sedimentary techniques, intended to gain a better understanding of the changing environments represented by the Holocene 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, which with subtle lateral and vertical variation comprised the alluvium in all three trenches. In particular, these techniques might help determine whether a dry landsurface formerly existed at the base of the alluvial sequence, prior to the build-up of alluvium, as a result of rising river levels. Microfossil examination might also 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 [4]-[8], [20], [21], [34]-[38], [56], [60], [61], [67], [79], [102] and [103] on the whole accumulated in wetland areas and as a result of prolonged flooding and 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 more oxidised of the alluvial clay ([38], [60], [61], and [79]) accumulated through episodic flooding of a relatively dry landsurface, may be poor, as a result of weathering. 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

Two environmental bulk soil samples were collected from Site OL-07807, PDZ5.36(C) and ten environmental bulk soil samples were collected from Site OL-08807, PDZ8.01, PDZ8.04 and 5.41(C), 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.

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 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. The results of the evaluation are summarised in Table 15.

In PDZ5.36(C) sample {2} came from a clayey-peat (Context [38], Phase 4) and sample {3} from flood-deposited alluvial clay (Context [37], Phase 6). In PDZ: 8.01, samples {13}[60] and {12}[59] were taken from alluvial clay (Phase 2) and an overlying thin peat layer (Phase 5). Samples {26}[79], {23}[78] and {20}[68], all from PDZ5.41(c), came from silty clay (Phase 2), silty sand (Phase 5) and peat layers (also Phase 5) respectively. Sample {19} [67] (PDZ5.41) came from a light blue-grey alluvial clay (Phase 6). Samples {26} [104], {27} [104], {28} [105], and {29} [113] from PDZ8.04/5.35 produced no flots and so will not be discussed further in this section.

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. A number of samples specifically for radiocarbon dating were taken ({4}, {5}, {6}, {7}, {16}, {17}, {21}, {22}, {24}, {25}, {30}, {31}), and 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

Abundant shells of freshwater molluscs were seen in the flot and residue of sample {3}, which also contained moderate quantities of ostracod valves. Mollusc opercula, and highly fragmented shells, were present in sample {26}, and very occasional ostracod valves were seen in sample {23}.

3.4.7 Plant remains

3.4.7.1 Trench PDZ5.36

Waterlogged wood fragments, root tissue and other vegetative plant material was present in both samples and very abundant in sample {3}, where it made up the majority of the large (400ml) flot. Occasional pieces of roundwood in this sample were large enough for species identification. Waterlogged seeds and fruits were reasonably abundant in both samples, and in {2} included a wide range of wetland plants, including water plantain (*Alisma* sp.), branched bur-reed (*Sparganium erectum*), fool's watercress (*Apium* cf. *nodiflorum*), alder (*Alnus glutinosa*) and sedges (*Carex* spp.), as well as seeds of several plants from dryer habitats. The assemblage from sample {3} was heavily dominated by abundant seeds of the aquatic pondweed (*Potamogeton* sp.) and water plantain/arrowhead (Alismataceae), with relatively few other taxa noted.

3.4.7.2 Trench PDZ8.01

The flot from sample {13}, from Phase 2 alluvial clay, consisted mainly of rootlets, with very occasional waterlogged seeds and small charcoal fragments. The only aspect of any note was the presence of an alder (*Alnus glutinosa*) seed, and a catkin from the same species. Waterlogged seeds were relatively abundant in the overlying sample {12}, but low in diversity with the majority from bog bean (*Menyanthes trifoliata*), sedges (*Carex* spp.) and mint (*Mentha* sp.).

3.4.7.3 Trench PDZ5.41

Rootlets, woody root or stem tissue and other vegetative plant material were present in all four samples and very abundant in samples {20} and {26}. Waterlogged seeds and fruits were abundant in samples {26}, {23} and {20} but less so in the most recent sample {19}. A wide range of wetland plants was represented, including bog bean, sedges, club-rush (*Schoenoplectus* sp.), cress (*Rorippa* sp.), water dropwort (*Oenanthe* sp.) and water plantain (*Alisma* sp.), as well as seeds of several plants from dryer habitats.

3.4.8 Insect remains

Occasional fragments of beetle (Coleopteran) exoskeleton were present in all samples, and these seemed slightly more abundant in sample {26}. Also present in samples {19}, {20} and {23} were larval cases of caddis flies (Trichoptera).

3.4.9 Animal Bones

Two small mammal bones were found in the sample residue of {23}.

PDZ	context	sample	proc vol(l)	vol kept(l)	flot vol(ml)	proc	chd wood	wlg seed	wlg misc	beet le	caddis case	moll usc	ostraco d
8.01	59	12	5	5	60	flot		+++	+++				
8.01	60	13	5	5	40	flot	+	+	+++	+			
5.41c	67	19	5	5	25	flot		++	+++	+	+		
5.41c	68	20	5	5	400	flot		+++	+++	+	+		
5.41c	78	23	5	5	50	flot	+	+++	+++	+	++		+
						res			+				
5.41c	79	26	5	5	200	flot		+++	+++	++		+	
						fl/res		+++	++	+		+	
5.36c	38	2	5	5	40				+++	++ +	+		
5.36c	37	3	5	5	400				+++	++ +	+		
												+++	

Table 15 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’.

The evaluation trenches in PDZ8 exposed the full Holocene deposit sequence down to the surface of floodplain gravel. In one trench prehistoric cultural features were observed cutting through these deposits. Peat and alluvial clay deposits were revealed in each of the trenches and preliminary interpretation of the environments these deposits represent has been made. In each trench post-medieval features were observed either within or cutting the natural sequence. In one trench a possible post-medieval land surface was also uncovered. All of the trenches were sealed by thick deposits of 19th–20th century made ground. The gravel deposits at the bases of the trenches might represent horizons beneath which no deposits of archaeological significance are likely to be found, however the gravels have not been examined in any detail and they need not necessarily be of Pleistocene date.

The trenches were excavated to assess the archaeological potential of PDZ8 where impacted upon by proposed construction works. Access to certain parts of PDZ8 was limited in some instances according to the construction programme. Construction works associated with proposed Bridge L04 and Underpass U03, as currently specified, will impact upon the archaeological horizons. The site of Bridge L04 was assessed by trench PDZ5.40/8.01. However trench PDZ5.35/8.04 intended to assess the site of Underpass U03 had to be relocated for practical reasons.

The trenches thus satisfy, as far as practically possible, the original requirements of the evaluation for PDZ8, as stated in the Written Scheme of Investigations (MoLAS-PCA 2007b).

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:

What is the potential for Late Glacial environment reconstruction and/or Late Upper Palaeolithic activity in the Pleistocene deposits on the site?

Gravels of possible Pleistocene date were observed at the base of each trench but they were not recorded in any detail or sampled, owing to their depth, contamination and rapid water ingress. As a result, there is no potential for obtaining information about Late Upper Palaeolithic activity or environment from the site.

What evidence exists for past river channels on the site and how does this contribute to our understanding of the origins of the modern and historic River Lea, Waterworks, Pudding Mill and City Mill Rivers?

The evidence identified in this excavation demonstrates active river channels (channel marginal and sand bank environments), near channel wetlands, overbank flooding and the silting up of abandoned channels. Deep gravel deposits in PDZ8.01/5.40 suggests a channel lies to the north-east or east of the trench. Thin sandy deposits within organic clay layers to the south and south-west of site (PDZ5.38 and PDZ5.41) indicate higher energy flow within a muddy creek or migration of small channels over mudflat environments. Dating of these deposits and the scrutiny of historic map evidence and deposit modelling during the assessment stage of the project might be able to shed light on the relationship of these small channels to each other and the development of the wetland and the historic River Lea, Waterworks River, Pudding Mill and City Mill River.

Can channel migration be identified in the northeast of the site? How does it compare with the evidence from Carpenters Road and can episodes of channel activity and abandonment be dated?

The low elevation of gravel highlighted to the northeast of site is indicative of a possible channel or near by channel. However, the overlying sediments were either not possible to sample (due to depth of deposit and rapid water ingress) or contained poor preservation of organics. Seeds and twigs suitable for radiocarbon dating were preserved above and below fine sand deposits to the south west of site (context [79]) that represent the migration of smaller channels across the floodplain. Radiocarbon dates from these deposits would provide a date for the episodes of channel activity and abandonment observed and allow comparison with the evidence for a migrating channel, or meander of the Lea at Site 26 Carpenters Road (OL-00105).

What potential is there for reconstructing the evolving river regime from environmental samples taken from the site?

Evidence for former river channels that crossed the site comprised gravely sands, overlain by sandy silts and silty clays. Coarse to fine silty sand deposits accumulated as bars on the riverbed or the margins of the channel ([7], [105] and [113]) and were

overlain by the organic clay of silting up channels or mudflats ([38], [60] and [61]). Within the organic clays thin fluvial sand deposits were identified (contexts [79]) and may represent slow higher energy periods within slow moving channels or migrating channels over mudflat environments. Further information about the characteristics of these watercourses and near channel deposits might be obtained by examination of environmental micro-and macrofossils preserved in the bulk and monolith samples taken from the deposits.

Is there evidence of past human activity associated with river exploitation or management?

No direct evidence for past human activity associated with river exploitation or management was observed during the evaluation. A ditch in PDZ8.04/5.35(C) may have been associated with drainage as indicated by mollusca in the fill, but the ditch itself cannot be linked to river activity. However, the presence of prehistoric activity upon a gravel island surround by wetland and migrating channels is a strong indication that the choice of location was influenced by the abundant and diverse resources available here and suggests exploitation of the river environment was taking place.

Is there evidence for past wetland exploitation?

There was no direct evidence for past wetland exploitation. The presence of the prehistoric features almost certainly relates to activities associated with the adjoining wetlands or the wetland–dryland interface as stated above.

What environmental evidence suitable for past landscape reconstruction and indirect evidence of past human activity exists within deposits associated with ancient river channels and other wetland areas?

Environmental evidence suitable for past landscape reconstruction may exist within the alluvial clay, organic and gravel deposits recorded during the evaluation. The final phase of these deposits are likely to be associated with the adjacent Pudding Mill and Waterworks Rivers. Further work on monolith samples (such as an examination of ostracods, foraminifera, pollen and diatoms), as well as from the bulk samples (where molluscs in particular but also insects and seeds may be preserved) may help reconstruct the historic characteristics of the floodplain environment and of the river channel itself.

Does any evidence of prehistoric activity exploiting the higher ground in the northwest and northeast of the site exist?

Trench PDZ8.04/5.35(C), located on a high elevation of gravel to the central north-west edge of the site provided the evidence for later prehistoric activity. This was in the form of ditches; postholes; pits and re-deposited cultural material, indicative of prehistoric occupation and activity in the area.

Importantly, this evidence for later prehistoric cultural activity forms part of the pattern for this seen elsewhere on the west side of the Lea Valley in the Olympic Park, specifically at site code OL-08607. The material recorded here is further evidence for this pattern of settlement, activity and exploitation.

Is there any evidence of Roman wetland or dryland occupation and other activity within the area of the site? If so, how does it relate to what is known of the settlement pattern further south in the Stratford Market area during the Roman period?

No evidence for any Roman activity was seen in any of the evaluation trenches.

What evidence for medieval/post medieval land use exists within the site area, including industrial and agricultural evidence?

Although none of the trenches contained any evidence of medieval activity (a period no doubt coinciding with the formation of thick alluvial deposits across the site; see section 3.3.6), several of the trenches contained 17th–18th century ditches, pits and/or uncertain features. A soil horizon was also recorded; indicating possible pastoral/agricultural activity within PDZ8, although relatively short lived. However, the presence of further flood deposits within this period would certainly have limited the extent of exploitation.

Do remains of the famous Bow porcelain manufactory survive on the site?

No remains of the Bow porcelain manufactory, or any deposits or features relating to it, were seen during the evaluation.

Are there any remains associated with the 12th century river crossing (which currently forms High Street)?

No evidence of a river crossing of any 12th century material was observed in the evaluation. Although it should be noted that the trenches were set at some distance to the north of the High Street, away from the line of any conjectured 12th century crossing.

How extensive is modern truncation and how thick is modern made ground across the site?

Modern truncation across the site varied. Generally there was good survival of the natural sequences, with the modern made ground and re-deposited layers superimposed on the natural horizons. However, based on what was observed during the attempted excavation of trenches PDZ5.37(C) and PDZ5.39(C) in the western area of PDZ8, it appears that this area had been subjected to modern truncation that left a minimum of the alluvial sequences.

The thickness of the modern made ground across PDZ8 was fairly uniform, measuring between 2.36m to 2.97m across the site.

4.2 General discussion of potential

The evaluation of PDZ8 has shown that earlier deposits survive intact beneath 19th–20th century made ground. Natural sequences composed of alluvial deposits, peat layers, and deposits of sand and silt overlay the basal gravels. In one trench prehistoric cultural features were observed towards the base of the natural sequence. Late post-medieval features, in the form of ditches, pits and a stake, were observed in the area, either cutting or within the natural sequence.

The DDBA (MoLAS-PCA 2007a) suggested that the site lies predominantly within a low-lying part of the valley floor that is likely to have contained active stream channels and backwater areas in the past, with an island of higher ground in the north-west and a promontory of the Low Terrace on the north-east side of the site, forming slightly raised and drier areas. It also indicated that PDZ8 had moderate potential for

prehistoric and Roman remains; an uncertain, probably low to moderate potential for early and later medieval remains, and high potential for post-medieval remains.

Based on what was observed during the evaluations it can be said that the true potential for PDZ8 is moderate to high for prehistoric remains; low for Roman and medieval remains, and high for post-medieval remains.

Evidence for the former river channel that crossed the site comprised the low elevation of the gravels seen to the north east of site. Possible channel edge or foreshore organic and gravelly, clays and sands (context [61]) overly the basal gravels here. Fluvial sands and clays (context [7], [105], and [113]) were deposited as banks or sand bars against the gravel island to the centre of the site, and recorded in PDZ8.04/5.35. The island of Pleistocene deposited gravels would have been dry land throughout the prehistoric and much of the historic period. Surrounded by the floodplain, migrating channels and associated wetlands and mudflats, areas of dry ground such as this would have provided abundant resources and a prominent and attractive focus for human activity over long periods of time.

Further information about the characteristics of the nearby watercourses and the associated wetlands and islands might be obtained by examination of environmental micro-and macrofossils preserved in the bulk and monolith samples taken from these deposits. The in situ peat deposits provide significant deposits of particular value for environmental reconstruction based upon good preservation of the pollen record within these deposits. This combined with dates from viable material from the lowest channel or wetland deposits and from possible prehistoric land surfaces would provide significant information on the development of the channel and its relationship to the floodplain islands and recorded archaeological features.

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 very good potential to contribute to our understanding of the evolving river regime and past environment of the Lower Lea.

4.3 Significance

The archaeological evidence seen on the site will provide a significant amount of information that should aid in the understanding of the past environment of the site and its surrounds, and associated human activity. The evidence for prehistoric occupation and activity found on the site is likely to be of regional significance.

This evidence, combined with geoarchaeological research will provide locally to potentially regionally significant information regarding the distribution and nature of prehistoric floodplain activity.

The geoarchaeological and environmental evidence recovered from the site has already been able to provide a significant amount of information which will aid in the understanding of the evolving environment of the Lea Valley. When the samples have been fully examined and the geoarchaeological records and environmental sample information added to the site-wide landscape reconstruction models being developed, the evidence for Holocene landscape change is likely to be of regional significance.

The information will assist in landscape reconstruction models being developed for the Lower Lea Valley and in considerations of the relationship between the changing environment and human activity. It is certainly of local significance and collectively when integrated with similar information from other sites on the Olympics as a whole, would be regionally significant, however, there is nothing to suggest that they are of national importance.

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 3.2 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

Further analysis is needed to establish whether any of the archaeological finds are rare either in a national or regional context.

Criterion 3: documentation

There may be considerable contemporary documentation for the post-medieval period of the site and there may be some possibility that some of this could be specific enough to relate to individual features.

Criterion 4: group value

The prehistoric 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 location of this site, close to the former confluence of the Lea and the Thames, has a bearing on the understanding of the past environment of the Thames’ floodplain. The post-medieval survival is remnants of part of the spread eastwards from the City of London and the urbanisation of the site area, combined with the linking of the former villages of Stratford and Mile End.

Criterion 5: survival/condition

The evaluation results have demonstrated that geoarchaeological and archaeological remains were preserved beneath several metres of modern made ground, although within areas of development will have been truncated to dramatically different levels. Considerable contamination in distinct parts of the site also limited both excavation and sampling.

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)

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

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 variable depths of alluvium overlying late Pleistocene/early Holocene gravels are likely to exist elsewhere in the local vicinity. The site also produced evidence of prehistoric activity in the form of pits and postholes; peat containing evidence of excellent organic preservation; medieval flood deposits; post medieval ditches and uncertain features dated to c 17th and early 18th century; and a buried soil horizon. 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.

6 Proposed development impact and recommendations

The proposed development of PDZ8 involves, amongst general land preparation (including ground reduction to formation levels; remediation; installation of services and drainage) the construction of Bridge L04 and Underpass U03. The construction methods for these works, as currently advised and assessed, will destroy the archaeological deposits within their footprints (MoLAS-PCA, 2007b).

The evaluation carried out across work packages 1 and 2 has shown that earlier deposits survive beneath the 19th century made ground. The observed archaeological deposits are of local to regional significance, with the evaluations being a sufficient record of their existence. The alluvial deposits surviving within the site are of considerable importance with respect to prehistoric settlement evidence and palaeoenvironmental potential

In terms of the Lea valley this site will form a crucial aspect of our understanding of the landuse of this floodplain during the later prehistoric period and will elucidate the nature of the human activity and impact on the landscape during this period. In addition, information relating to the evolving Holocene environment and past river regime is likely to be preserved in the samples taken from the site.

Trench PDZ8.01/5.40 (C) was positioned to target and assess the proposed location of Bridge L04 and represented an assessment of no less than 5% of the ground to be impacted upon, thus fulfilling the requirements for evaluation. Trench PDZ8.04/5.35(C) was originally intended to assess the archaeological potential of the area impacted upon by proposed Underpass U03, however its original position was not practical for evaluation purposes, and as such the trench was re-located. The remainder of the development works, as currently advised, is not anticipated to impact upon archaeological horizons. As such no further work is recommended at the evaluated locations, despite their considerable archaeological significance. Preservation *in situ* would be an appropriate mitigation strategy for the tangible archaeological evidence (prehistoric and post medieval remains), with further off-site work on the environmental samples collected from the site to gain a better understanding of the local river regime and evolving past landscape.

Initial evaluation of the samples collected suggests they have good palaeoenvironmental potential. Eight samples produced identifiable environmental remains of which six samples contained large amounts of material (plant remains indicative mainly of an aquatic habitat, insects and molluscs) to merit detailed assessment, and if dated to the prehistoric period both bulk and monolith samples might preserve useful information about vegetation change and the changing environment of the Olympic site from an area where prehistoric activity has also been recorded. The few charred plant remains may also provide information on crop husbandry, with the value of the remains increasing if any of the material is found to be from the prehistoric period.

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:

- Two litres of the unprocessed material from eight samples including {2}, {3} and {26} be processed by paraffin flotation for the assessment of insect remains (8 samples);
- Five litres of the unprocessed material from samples {3}, {23}, {26} [79], {26} [104], {27}, {28} and {29} be wet sieved over a 0.25mm mesh 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 (9 samples);
- Five litres of samples {2}, {3}, {12}, {19}, {20}, {23}, and {26} [79], be wet sieved over a 0.5mm mesh and examined together with the evaluation flots and assessed for plant remains. In addition samples {26} [104], {27}, {28} and {29} should also be processed in an attempt to find datable material from the prehistoric activity horizons (12 flots/residues);
- Four radiocarbon dates are obtained by AMS on identified twigs, seeds or other plant material from the top and bottom of two sequences of peat and organic clay deposits associated with the wetland development and channel migration around the gravel island. In addition two radiocarbon dates are obtained by AMS on identified twigs, seeds or other plant material from the horizons of prehistoric activity in order to date the phases and duration of human activity on the gravel island (6 dates);
- Pollen and diatom assessment of the four stratigraphic sequences are undertaken (16 sub-samples for each technique 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;
- 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 on behalf of the Olympic Delivery Authority (ODA), and David Divers (English Heritage GLAAS) for monitoring the project on behalf of the London Borough of Newham.

The author would like to thank: Phil Frickers, Luciano De Cammillis, Glen Farley, Matt Harrison, Veysel Apoydin, and Paul McGarrity on-site assistance; Phil Frickers and Jem Rogers for their surveying; Matt Williams and Jane Corcoran for their geoarchaeological assistance, and Virgil Yendell for contributing to this report; James Gerrard, Damian Goodburn and Chris Jarrett for their assessment of the site finds; Gary Brown, Helen Clough and Frank Meddens, Raoul Bull and Kieron Tyler for project management and editing, and to Josephine Brown for work on the illustrations. In addition, thanks are due to Nuttalls Construction for their cooperation and assistance during the project.

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9 Appendix 1: NMR OASIS archaeological report forms

9.1 OL-07807

OASIS ID: preconst1-45044	
Project details	
Project name	Olympics PDZ8, Works Package 2
Short description of the project	Three trenches were planned for an archaeological evaluation as part of the work on the London 2012 Olympics site. One trench produced evidence of a natural depositional sequence, a post-medieval ditch, pit, and wooden stake with associated packing cut, sealed by 19th to 20th century made ground. The remaining two trenches were abandoned.
Project dates	Start: 22-02-2007 End: 16-05-2007
Previous/future work	No / No
Any associated project reference codes	OL-07807 - Sitecode
Type of project	Field evaluation
Site status	Local Authority Designated Archaeological Area
Current Land use	Industry and Commerce 1 - Industrial
Monument type	DITCH Post Medieval
Monument type	PIT Post Medieval
Monument type	STAKE Post Medieval
Significant Finds	STAKE Post Medieval
Methods & techniques	'Augering','Grab-sampling','Sample Trenches'
Development type	Not recorded
Development type	London 2012 Olympic Development
Prompt	Direction from Local Planning Authority - PPG16
Position in the planning process	After full determination (eg. As a condition)
Project location	
Country	England
Site location	GREATER LONDON NEWHAM STRATFORD Olympics PDZ8, Wk Pk 2
Postcode	E15 2
Study area	32000.00 Square metres
Site coordinates	TQ 3790 8340 51.5321447810 -0.01165193474080 51 31 55 N 000 00 41 W Point
Height OD	Min: 1.44m Max: 2.05m
Project creators	
Name of Organisation	MoLAS/PCA Ltd

Project brief originator	MoLAS/PCA
Project design originator	MoLAS/PCA Ltd
Project director/manager	Gary Brown
Project supervisor	Sarah Barrowman
Type of sponsor/funding body	Olympic Delivery Authority
Name of sponsor/funding body	Olympic Delivery Authority
Project archives	
Physical Archive recipient	LAARC
Physical Archive ID	OL-07807
Physical Contents	'Animal Bones','Ceramics','Wood'
Digital Archive recipient	LAARC
Digital Archive ID	OL-07807
Digital Contents	'Survey'
Digital Media available	'Spreadsheets','Survey','Text','Database','Images raster / digital photography'
Paper Archive recipient	LAARC
Paper Archive ID	OL-07807
Paper Contents	'Survey'
Paper Media available	'Context sheet','Diary','Matrices','Miscellaneous Material','Photograph','Plan','Report','Section','Survey '
Entered by	Sarah Barrowman (sbarrowman@pre-construct.com)
Entered on	10 July 2008

9.2 OL-08807

OASIS ID: preconst1-45243	
Project details	
Project name	Olympics PDZ8, Works Package 1
Short description of the project	Four evaluation trenches were excavated on the site PDZ8, Works Package 1, part of the work undertaken for the London 2012 Olympic Development site. The trenches were examined to the level of the natural gravels, with these being overlain by alluvial sequences, followed by a layer of peat, sealed by further alluvial deposits. In one trench prehistoric evidence and features were observed within and cutting the lower levels of the alluvial sequence, whilst in several trenches post-medieval features were observed either within or cutting the alluvial sequence. A possible post-medieval relict land surface was also observed overlying the alluvial sequence in one trench. All the trenches were

	than sealed by layers of re-deposited clays or silts, overlain by 19th-20th century made ground deposits.
Project dates	Start: 17-12-2007 End: 23-04-2008
Previous/future work	Yes / No
Any associated project reference codes	OL-08807 - Sitecode
Type of project	Field evaluation
Site status	Local Authority Designated Archaeological Area
Current Land use	Industry and Commerce 1 - Industrial
Monument type	PITS Late Prehistoric
Monument type	POST HOLES Late Prehistoric
Monument type	DITCHES Late Prehistoric
Monument type	DITCHES Post Medieval
Significant Finds	POTTERY Late Prehistoric
Significant Finds	STRUCK FLINT Late Prehistoric
Significant Finds	BURNT FLINT Late Prehistoric
Significant Finds	POTTERY Post Medieval
Methods & techniques	'Environmental Sampling','Sample Trenches'
Development type	Not recorded
Development type	London 2012 Olympic Development
Prompt	Direction from Local Planning Authority - PPG16
Position in the planning process	After full determination (eg. As a condition)
Project location	
Country	England
Site location	GREATER LONDON NEWHAM STRATFORD Olympics PDZ8, Wk Pk 1
Postcode	E15
Study area	60800.00 Square metres
Site coordinates	TQ 3804 8367 51.5345369795 -0.00952874810546 51 32 04 N 000 00 34 W Point
Height OD	Min: 1.39m Max: 2.57m
Project creators	
Name of Organisation	MoLAS/PCA Ltd
Project brief originator	MoLAS/PCA
Project design originator	MoLAS/PCA Ltd
Project director/manager	Gary Brown
Project	Sarah Barrowman

supervisor	
Type of sponsor/funding body	Olympic Delivery Authority
Name of sponsor/funding body	Olympic Delivery Authority
Project archives	
Physical Archive recipient	LAARC
Physical Archive ID	OL-08807
Physical Contents	'Ceramics','Wood','Worked stone/lithics','other'
Digital Archive recipient	LAARC
Digital Archive ID	OL-08807
Digital Contents	'Survey'
Digital Media available	'Database','Images raster / digital photography','Survey'
Paper Archive recipient	LAARC
Paper Archive ID	OL-08807
Paper Contents	'Environmental','Survey'
Paper Media available	'Context sheet','Diary','Map','Matrices','Photograph','Plan','Report','Section'
Entered by	Sarah Barrowman (sbarrowman@pre-construct.com)
Entered on	10 July 2008

10 Appendix 2: 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 i.e.: 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 temperature was as warm as if not warmer than today. To a large extent human evolution has taken place within the Quaternary period.

11 Appendix 3: Site index

11.1 OL-08807

Context No.	Plan	Section/Elevation	Type	Description	Date	Phase
1	-	S1	Layer	Clayey-Silt and Rubble	Post-Medieval to Modern	10
2	-	S1	Layer	Silt and Wood	Post-Medieval to Modern	10
3	-	S1 and S2	Layer	Wood and Silt	Post-Medieval to Modern	10
4	PDZ5.36	S1	Natural	Alluvial Clay	Uncertain	7
5	-	S1	Natural	Alluvial Clay	-	5
6	PDZ5.36	S1	Layer	Clayey-Peat	-	5
7	PDZ5.36	S1	Layer	Clayey-Sand	-	1
8	-	S1	Natural	Alluvial Clay	-	5
9	-	S1;S2	Layer	Clay	Post-Medieval to Modern	10
10	-	S1; S2	Layer	Sandy-Silt	Post-Medieval to Modern	10
11	-	S1	Layer	Clay and Silt	Post-Medieval to Modern	10
12	-	S1; S2	Layer	Clay	Post-Medieval to Modern	10
13	-	S1	Layer	Sandy-Silt	Post-Medieval to Modern	10
14	-	S1; S2	Layer	Rubble	Post-Medieval to Modern	10
15	-	S1 ;S2	Layer	Clay	Post-Medieval to Modern	10
16	-	S1 ;S2	Layer	Clayey-Silt	Post-Medieval to Modern	10
17	-	S1; S2	Layer	Redeposited Clay	Post-Medieval	9
18	PDZ5.36	S1	Natural	Alluvial Clay	Uncertain	6
19	PDZ5.36	S1	Cut	Large Cut	Uncertain	6
20	-	S1	Natural	Alluvial Clay	-	5
21	-	S1	Layer	Alluvial Clay	Uncertain	5
22	-	S1	Cut	Cut	Uncertain	5
23	PDZ5.36	S1	Layer	Clay	Post-Medieval	9
24	PDZ5.36	S1	Cut	Cut	Uncertain	6
25	-	S2	Layer	Concrete	Post-Medieval to Modern	10
26	-	S2	Layer	Modern Made Ground	Post-Medieval to Modern	10
27	-	S2	Layer	Industrial Debris	Post-Medieval to Modern	10
28	-	S2	Layer	Dump Layer	Post-Medieval to Modern	10
29	-	S2	Layer	Ferrous Clay	Post-Medieval to Modern	10
30	-	S2	Layer	Dump Layer	Post-Medieval to Modern	10
31	-	S2	Layer	Dump Layer	Post-Medieval to Modern	10
32	-	S2	Layer	Dump Layer	Post-Medieval to Modern	10
33	-	S1	Layer	Rubble	Post-Medieval to Modern	10
34	-	S3	Natural	Alluvial Clay	Uncertain	7
35	-	S3	Layer	Alluvial Clay	Uncertain	7
36	-	S3	Layer	Alluvial Clay	Uncertain	7
37	-	S3	Layer	Alluvial Clay	-	5
38	-	S3; S6	Layer	Peat	-	4
39	-	S4	Layer	Sand with Rubble	Post-Medieval to Modern	10
40	-	S4	Layer	Slate	Post-Medieval to Modern	10
41	-	S4	Layer	Sandy-Silt	Post-Medieval to Modern	10
42	-	S4	Layer	Silty-Sand	Post-Medieval to Modern	10

43	-	S4	Layer	Slate	Post-Medieval to Modern	10
44	-	S4	Layer	Silty-Sand	Post-Medieval to Modern	10
45	-	S4	Layer	Slate and Sand	Post-Medieval to Modern	10
46	-	S4	Layer	Silty-Sand	Post-Medieval to Modern	10
47	-	S4	Layer	Sandy-Silt	Post-Medieval to Modern	10
48	-	S4	Layer	Clay with Sand	Post-Medieval to Modern	10
49	-	S4 ;S5	Layer	Sandy-Silt	Post-Medieval to Modern	10
50	-	S5	Layer	Sandy-Silt	Post-Medieval to Modern	10
51	-	S5	Layer	Clayey-Silt	Post-Medieval to Modern	10
52	-	S5	Layer	Silty-Clay	Post-Medieval to Modern	10
53	-	S5	Layer	Sandy-Silt	Post-Medieval to Modern	10
54	-	S5	Layer	Sandy-Clay	Post-Medieval to Modern	10
55	-	S5 ;S7	Layer	Sandy-Clayey-Silt	Post-Medieval to Modern	10
56	-	S5; S7	Layer	Peat	Post-Medieval	9
57	-	S6	Layer	Clay	-	1
58	-	S6	Layer	Gravel	-	1
59	-	S7	Layer	Peat	-	5
60	PDZ5.40/8.01	S7	Layer	Clay	-	5
61	PDZ5.40/8.01	S7	Layer	Peat	-	4
62	PDZ5.40/8.01	S7	Natural	Gravel	-	1
63	-	S7	Layer	Post Medieval Tiles	Post-Medieval to Modern	10
64	-	S7	Layer	Industrial Debris	Post-Medieval to Modern	10
65	-	-	Layer	Dump Layer	Post-Medieval to Modern	10
66	PDZ5.41	S9	Layer	Redeposited Clay	Post-Medieval	9
67	PDZ5.41	S9; S10	Layer	Clay	-	5
68	PDZ5.41	S10	Layer	Peat	-	4
69	-	S9	Cut	Cut	Post-Medieval to Modern	10
70	-	S9	Fill	Fill of [69]	Post-Medieval to Modern	10
71	-	S9	Cut	Cut	Post-Medieval to Modern	10
72	-	S9	Fill	Fill of [71]	Post-Medieval to Modern	10
73	PDZ5.41	S9; S10	Cut	Ditch	Post-Medieval	6
74	PDZ5.41	S9; S10	Fill	Fill of [73]	Post-Medieval	6
75	-	-	Fill	Fill of [73]	Post-Medieval	6
76	PDZ5.41	-	Fill	Fill of [73]	Post-Medieval	6
77	PDZ5.41	S10	Layer	Gravel	-	1
78	-	S10	Layer	Sand	-	1
79	-	S10	Layer		-	1
80	PDZ5.35/8.04 Stage 1	-	Fill	Fill of [81]	-	3
81	PDZ5.35/8.04 Stage 1	-	Cut	Pit	Uncertain	3
82	PDZ5.35/8.04 Stage 1	-	Timber	Stake in [83]	Uncertain	3
83	PDZ5.35/8.04 Stage 1	-	Cut	Cut from [82]	Uncertain	3
84	PDZ5.35/8.04 Stage 1	-	Fill	Fill of [85]	Prehistoric	2
85	PDZ5.35/8.04 Stage 1	-	Cut	Posthole	Prehistoric	2
86	PDZ5.35/8.04 Stage 1	-	Fill	Fill of [87]	Uncertain	3

87	PDZ5.35/8.04 Stage 1	-	Cut	Posthole	Uncertain	3
88	PDZ5.35/8.04 Stage 1	-	Fill	Fill of [89]	Prehistoric	2
89	PDZ5.35/8.04 Stage 1	-	Cut	Pit	Prehistoric	2
90	PDZ5.35/8.04 Stage 1	-	Fill	Fill of [91]	Uncertain	3
91	PDZ5.35/8.04 Stage 1	-	Cut	Pit	Uncertain	3
92	PDZ5.35/8.04 Stage 1	-	Fill	Fill of [93]	Post-Medieval	6
93	PDZ5.35/8.04 Stage 1	-	Cut	Ditch	Post-Medieval	6
94	-	S11	Layer	Concrete	Modern	10
95	-	S11	Layer	Levelling Deposit	Modern	10
96	-	S11	Layer	Made Ground	Modern	10
97	-	S11	Layer	Redeposited Silt	Post-Medieval to Modern	9
98	-	S11	Layer	Redeposited Silt	Post-Medieval to Modern	9
99	-	S11	Layer	Redeposited Silt	Post-Medieval to Modern	9
100	-	S11	Layer	Redeposited Silt	Post-Medieval to Modern	9
101	-	S11	Layer	Relict Landsurface	Post-Medieval	8
102	-	S11	Natural	Alluvial Clay	-	7
103	-	S11	Natural	Peat	-	4
104	PDZ5.35/8.04 Stage 1	S11	Natural	Alluvial Clay	Prehistoric	2
105	-	S11	Natural	Sandy-Clay	-	1
106	PDZ5.35/8.04 Stage 2	-	Fill	Fill of [107]	Prehistoric	2
107	PDZ5.35/8.04 Stage 2	-	Cut	Ditch	Prehistoric	2
108	PDZ5.35/8.04 Stage 2	-	Fill	Secondary Fill of [110]	Prehistoric	2
109	PDZ5.35/8.04 Stage 2	-	Fill	Primary Fill of [110]	Prehistoric	2
110	PDZ5.35/8.04 Stage 2	-	Cut	Ditch	Prehistoric	2
111	PDZ5.35/8.04 Stage 2	-	Fill	Single Fill of [112]	Prehistoric	2
112	PDZ5.35/8.04 Stage 2	-	Cut	Posthole	Prehistoric	2
113	PDZ5.35/8.04 Stage 2	-	Natural	Clayey-Sand	-	1
114	PDZ5.35/8.04 Stage 2	-	Natural	Sandy-Gravels	-	1

11.2 OL-07807

Context No.	Plan	Section/Elevation	Type	Description	Date	Phase
1	PDZ5.38	-	Cut	Ditch	Post-Medieval	2
2	-	-	Fill	Fill of [1]	Post-Medieval	2
3	PDZ5.38	-	Cut	Pit	Post-Medieval	2
4	PDZ5.38	-	Fill	Fill of [3]	Post-Medieval	2
5	PDZ5.38	-	Stake	Wooden Stake	Post-Medieval	2
6	PDZ5.38	-	Cut	Cut Associated with [5]	Post-Medieval	2

7	PDZ5.38	-	Fill	Fill of [6]	Post-Medieval	2
8	-	-	Layer	Made Ground	Post-Medieval	3
9	-	-	Fill	Secondary Fill of [1]	Post-Medieval	2
10	-	-	Fill	Primary Fill of [1]	Post-Medieval	2
11	PDZ5.38	-	Natural	Alluvium	Unknown	1
12	-	-	Natural	Humic Silty-Clay	Unknown	1
13	-	-	Natural	Silty-Clay	Unknown	1
14	-	-	Natural	Sandy-Silt	Unknown	1
15	-	-	Natural	Gravels	Unknown	1

12 Appendix 4: Finds assessment

12.1 Worked and Burnt flint

Chris Jarrett and Barry Bishop

12.1.1 OL-08807, Trench PDZ8.04/5.35

12.1.1.1 Introduction

There are seven fragments of burnt flint (84g) all from context [104] and five fragments of worked flint from two contexts. The burnt and worked flint is in good condition and indicates that it was discarded close by and therefore not transported over any distance by natural processes and indicative of prehistoric activity in the vicinity.

12.1.1.2 The Worked flint and its distribution

12.1.1.2.1 CONTEXT [104]

1 narrow caudal flake, dated to the late 2nd and 1st millennium BC.

1 thermal spall, three or four flakes taken off in a row along one edge, representing either a fortuitous natural damage or deliberate human action. Dated to the late 2nd and 1st millennium BC.

12.1.1.2.2 CONTEXT [106]

1 core rejuvenation blade with a hinge fracture on dorsal face. Dated to the Mesolithic or possibly early Neolithic periods.

1 core rejuvenation blade, hinge fracture on dorsal face. Dated to the Mesolithic or possibly early Neolithic periods.

1 flake. Dated to the Mesolithic or Neolithic periods

12.1.1.3 Significance, potential and recommendations for further work

The burnt flint is significant for indicating prehistoric hearths in the vicinity of the site. The worked flint provides further evidence for prehistoric activity from a source either on the site or close by. Prehistoric activity is known from other excavations work at the London 2012 Olympic Site, for example (OL-01507, PDZ1, Trench 12 and its extensions). The worked flint has the potential to date the deposits it was found in and informs upon prehistoric activities on the site and may require illustration. Recommendations for further work are that the flint from this excavation should be further analysed and compared with the other assemblages from the Olympics sites.

12.2 The Ceramic Building Material

12.2.1 OL-08807, Trench PDZ8.01/5.40(C)

There are two fragments of ceramic building material from two contexts from trench PDZ8.01/5.40(C). The material is not abraded and was therefore deposited soon after breakage. All is broadly dated to the post-medieval period. A single frogged brick fragment of a late 17th–early 18th century date came from context [55] and a single roof tile fragment of a general post-medieval date was found in context [64].

The material is of little significance, it dates the contexts it was found in and there are no recommendations for further work.

12.2.2 OL-08807, Trench PDZ8.04/5.35(C)

There are a total of six fragments of ceramic building material recovered from Trench PDZ8.04/5.35(C), which derived from two contexts. None of the material is un-stratified. It was probably deposited soon after breakage as it is not abraded. It is broadly dated to the post-medieval period. Five fragments come from deposit [92] and consist of two brick fragments, dated either to the late 17th–early 18th century or 18th to early 19th century, as well as elements of two roof tiles and one fragment of a pan tile. Deposition date for this context is therefore likely to be late 18th to early 19th century. Context [97] produced a brick fragment of a general post-medieval date.

The material is of little significance, it dates the context it was found in and there are no recommendations for further work.

12.2.3 OL-08807, Trench PDZ5.36(C)

There are a total of seven fragments (none un-stratified) of ceramic building material from three contexts. The material is not abraded and was therefore deposited soon after breakage. All the material is broadly dated to the post-medieval period and was found in contexts [2], [4] and [7]. Context [2] also produced a single fragment of a badly fired stoneware drain and dates from the mid-19th century onwards. Forms consist of pan tile and general roof tile (three fragments each).

The material is of little significance, it date the contexts it was found in and there are no recommendations for further work.

12.2.4 OL-08807, Trench PDZ5.41(C)

There are two fragments of ceramic building material from a single context in Trench 5.41(C). The material is not abraded and was therefore deposited soon after breakage. Both are broadly dated to the post-medieval period. The two fragments derive from context [75], one is of a late 17th – early 18th century type and the other fragment has a general post-medieval date.

The material has little significance, it dates the context it was found in and there are no recommendations for further work.

12.3 The pottery

James Gerrard and Chris Jarrett

12.3.1 OL-08807, Trench PDZ8.04/5.35(C)

12.3.1.1 Introduction

There are seven sherds of pottery (none unstratified) from site OL-08807. These date to the Late Bronze Age / Middle Iron Age and to the post-medieval period, probably the mid to late 19th century. The pottery is generally in good condition, but fragmentary with no complete profiles of vessels present, although deposition probably happened soon after breakage. The pottery derives from four contexts.

12.3.1.2 Distribution

Table 16 shows the distribution of the pottery in the contexts it was recovered from, the number of sherds and a spot date for each deposit.

Context	Sherd count	Spot date
[97]	1	1580–1900
[99]	1	1830–1900
[104]	2	Late Bronze Age – Middle Iron Age
[106]	3	Late Bronze Age – Middle Iron Age

Table 16 OL-08807 Pottery spot dating index

12.3.1.3 Significance, potential and recommendations for further work

The significance of the pottery is at a local level and demonstrates what types of activity occurring at different times. The ceramic profile of the site largely follows that which would be expected locally, and comparable ceramic assemblages can be found on other excavations in North East London. Prehistoric pottery was also recovered from another Olympics archaeological excavation (OL-01507, PDZ1, Trench 12 and its extensions) but in significantly larger quantities. The post-medieval pottery (comprising sherds of a local redware flower pot and English stoneware with a Bristol-glaze) is of little significance. The main potential of the assemblage is as a dating tool for the associated contexts and a number of vessels merit illustration or photographing. Recommendations for further work are that the prehistoric pottery sherds should be further analysed and compared with the similarly dated groups across the larger landscape investigated and related to other activity of the same period in the vicinity.

12.3.2 OL-07807, Trench 5.38(C)

12.3.2.1 Introduction

There are 21 sherds of post-Roman pottery (none un-stratified) from OL-07807, PDZ8, TR5.38(C), dating from the 18th century onwards. The pottery is generally in

good condition, with recognisable vessel shapes. There is little or no abrasion so it was probably deposited soon after breakage. The pottery derives from four contexts and constitutes small groups (fewer than 30 sherds). Standard Museum of London pottery codes were used to classify it.

12.3.2.2 Distribution

Table 17 shows the distribution of the pottery in the context it was recovered from, the number of sherds and a spot date for each deposit.

Context	Sherd count	Spot date
[2]	9	1820–1900
[4]	7	1780–1850
[9]	1	1550–1900
[10]	4	1840–1860

Table 17 OL-07807 Pottery spot dating index.

12.3.2.3 Significance, potential and recommendations for further work

There is little or no significance to the stratified pottery at a local level. The ceramic profile of the assemblage follows what would be expected for the local area and similar ceramic assemblages can be found on other excavations in the vicinity.

The post-medieval assemblage follows the national ceramic profile with industrial finewares (mid 18th-century white salt-glazed stoneware and Creamware, besides later 19th-century transfer-printed white earthenware and Yellow ware). These are mostly from a Midlands source. A refined whiteware plate with a shell-edge rim of a type common between 1840-60 dated context [10]. Post-medieval red earthenwares are of a local type, besides a chamber pot in Surrey-Hampshire border redware (exclusively found in context [9]) and Black ware from the Midlands or North-West England and Sunderland coarse ware from the North East.

The stonewares comprise a blacking bottle of a generic English source and a jar in Nottingham stoneware. The main potential of the pottery is to date the contexts it derives from. None of the vessels merit illustration or photographing. The pottery is generally mundane with no unusual fabrics. There are no recommendations for further work, but for a publication of the archaeological sites of the Olympic development area the assemblage will require to be referenced.

12.4 The Clay Tobacco Pipe

Chris Jarrett

12.4.1 OL-08807, Trench PDZ5.41(C)

12.4.1.1 Introduction

A small assemblage of clay tobacco pipes (one stratified complete bowl) was recovered from site OL-08807, Trench 5.41. The bowl came from deposit [75] and consists of an Atkinson and Oswalds' (1969) type 22 (AO22), dating to 1680-1710.

Its complete length is 310mm. The pipe is in good condition, but fragmentary and so was deposited soon after breakage or discard.

12.4.1.2 Distribution

Context	Item count	Spot date	Description
75	1	1680–1710	Complete bowl, AO22

Table 18 OL-08807 clay tobacco pipe spot dating index

12.4.1.3 Significance, potential and recommendations for further work

The clay tobacco pipe is significant at a local level for being complete and adds to the information on the lengths of clay tobacco pipes, which are almost found in fragmentary and incomplete state. The AO22 bowl is the most commonly found type found in London during its period of production and it therefore fits within the expected profile for clay tobacco pipes for the region. The main potential of the clay tobacco pipe is to date the context it was found in. It does not require illustrating or photographing. It is recommended that this pipe is mentioned in any publication on the clay tobacco pipes from the Olympics excavations

12.4.2 OL-07807, Trench PDZ5.38(C)

12.4.2.1 Introduction

A small assemblage of three clay tobacco pipes (none un-stratified) was recovered from site code OL-07807, PDZ 8, Trench 5.38. The material occurs only in the form of stems. It is not abraded and so is likely to have been deposited shortly after breakage. A single stem from deposit [4] by its diameter indicates a late 18th or 19th century date, whilst two thin stems from context [10] may be of 19th century date.

12.4.2.2 Significance, potential and recommendations for further work

The clay tobacco pipes from this trench are of no significance; they have limited potential for dating the contexts they were found in. There are no recommendations for further work.

12.5 The glass

Chris Jarrett

12.5.1 OL-07807, Trench 5.38(C)

12.5.1.1 Introduction and distribution

A single fragment of glass was recovered from Trench 5.38. The vessel is a dark green glass cylindrical wine bottle and was blown with a deep ‘kick’ and dates to between c 1780–1800 (Dumbrell 1983, 113). It was recovered from context [2] and is in a good condition, so was probably deposited soon after breakage.

12.5.1.2 Significance, potential and recommendations for further work

The glass vessel is of little significance, its potential is to date the context it was found in and there are no recommendations for further work.

12.5.1.3 Bibliography

Dumbrell, R. 1983. *Understanding Antique wine bottles*. Antique Collectors' Club, Suffolk.

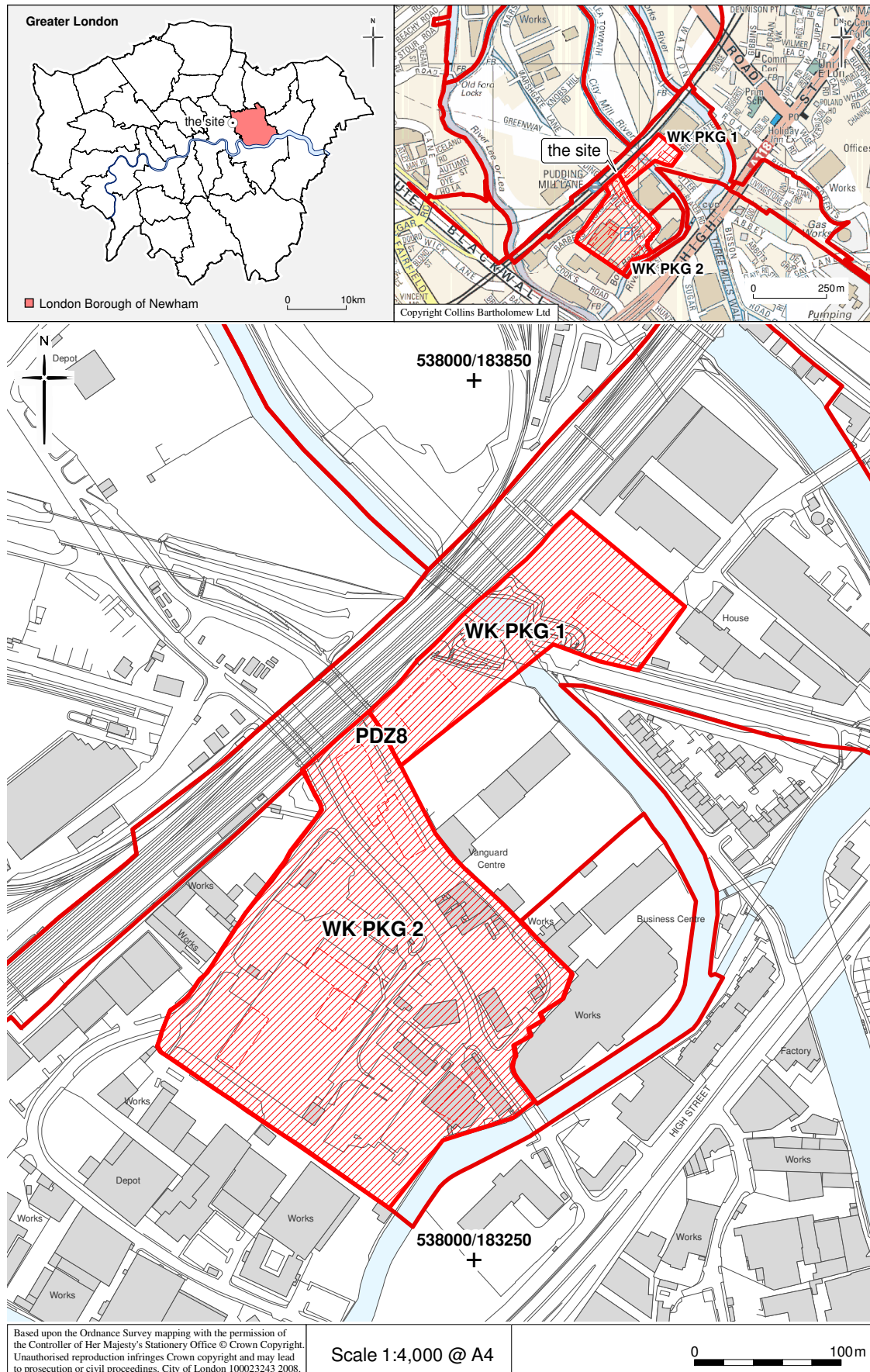


Fig 1 Site location

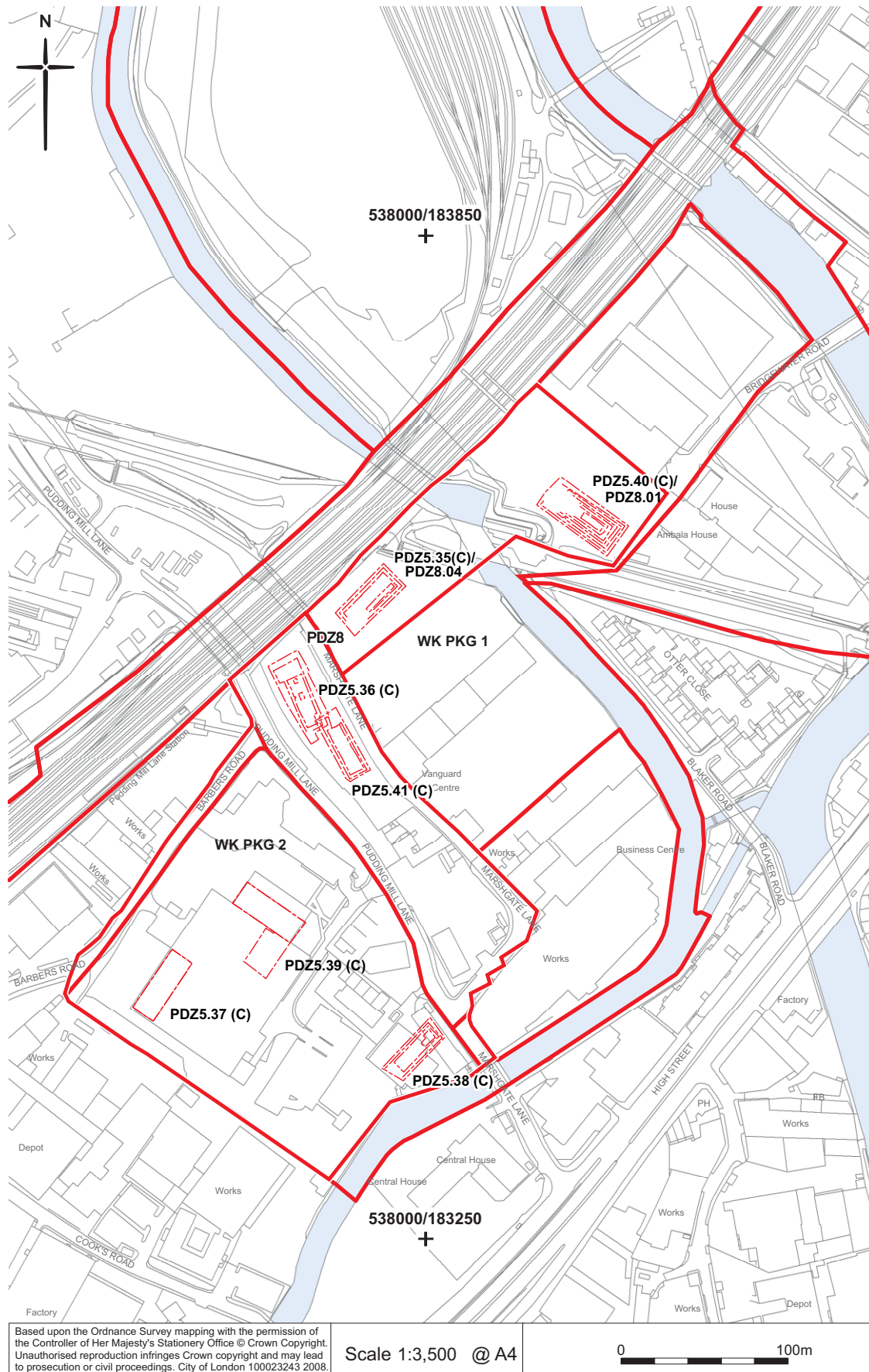


Fig 2 Trench locations

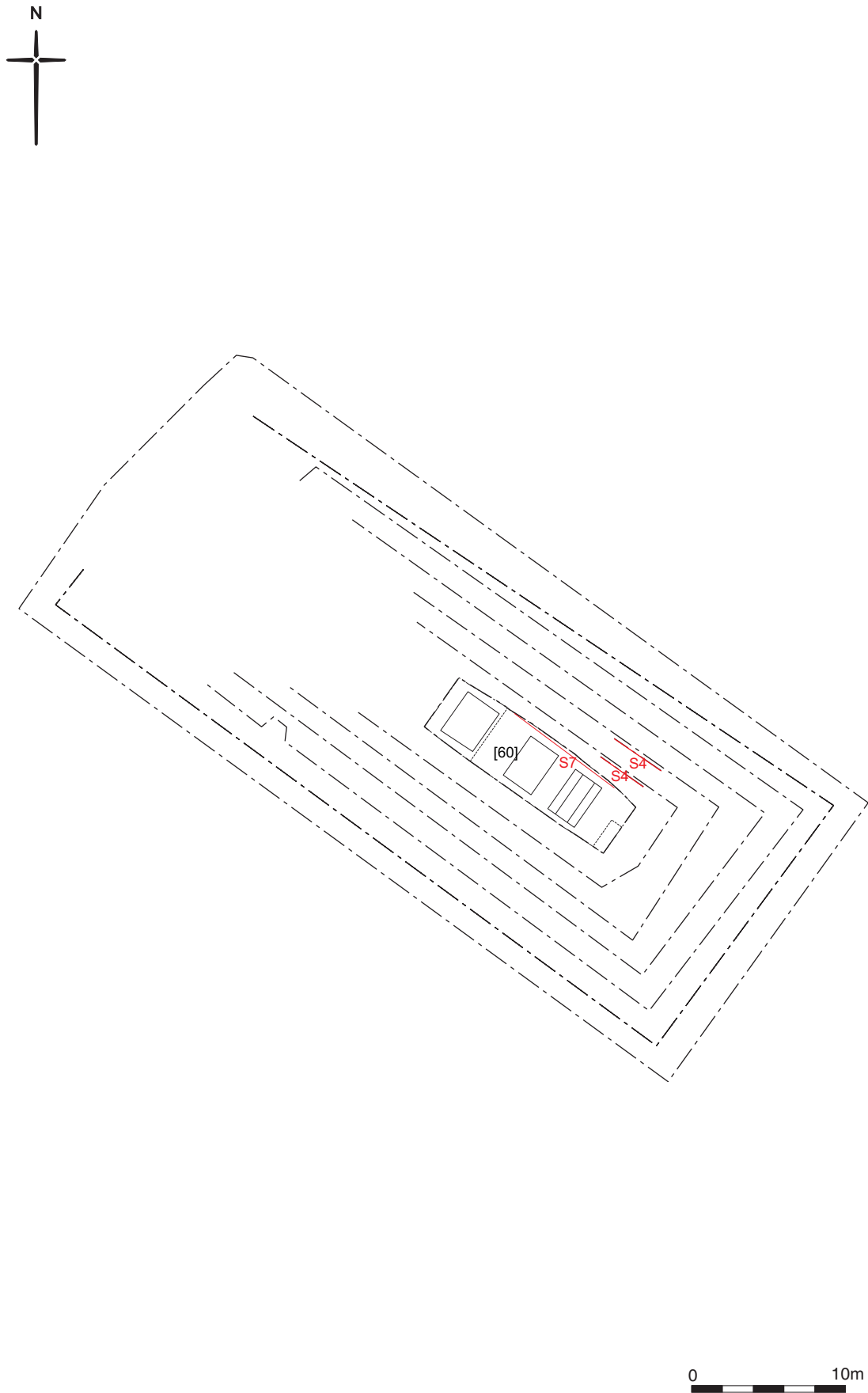


Fig 3 Plan of Trench PDZ8.01/5.40(C)

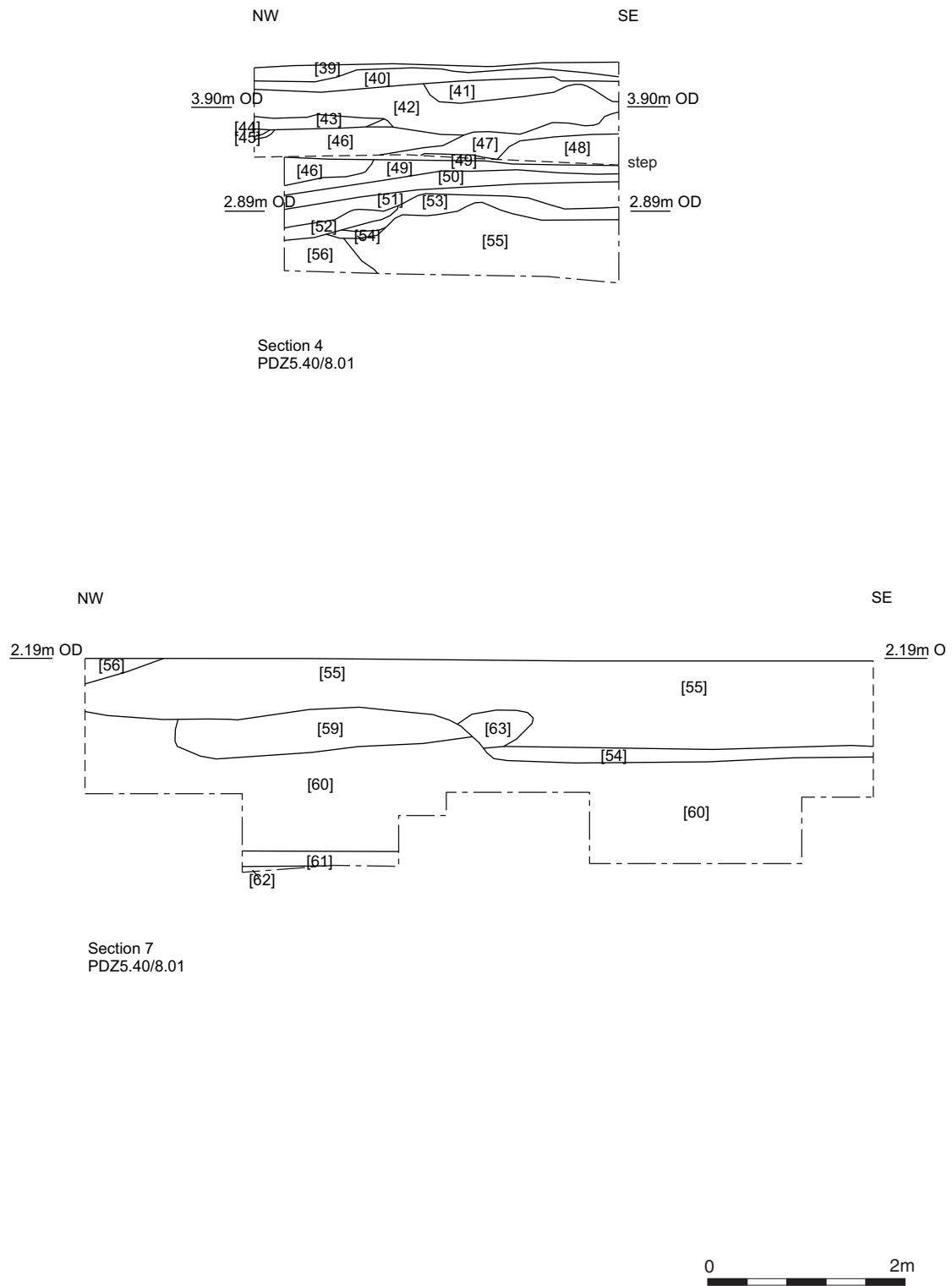


Fig 4 South-west facing sections 4 and 7 of Trench PDZ8.01/5.40(C)

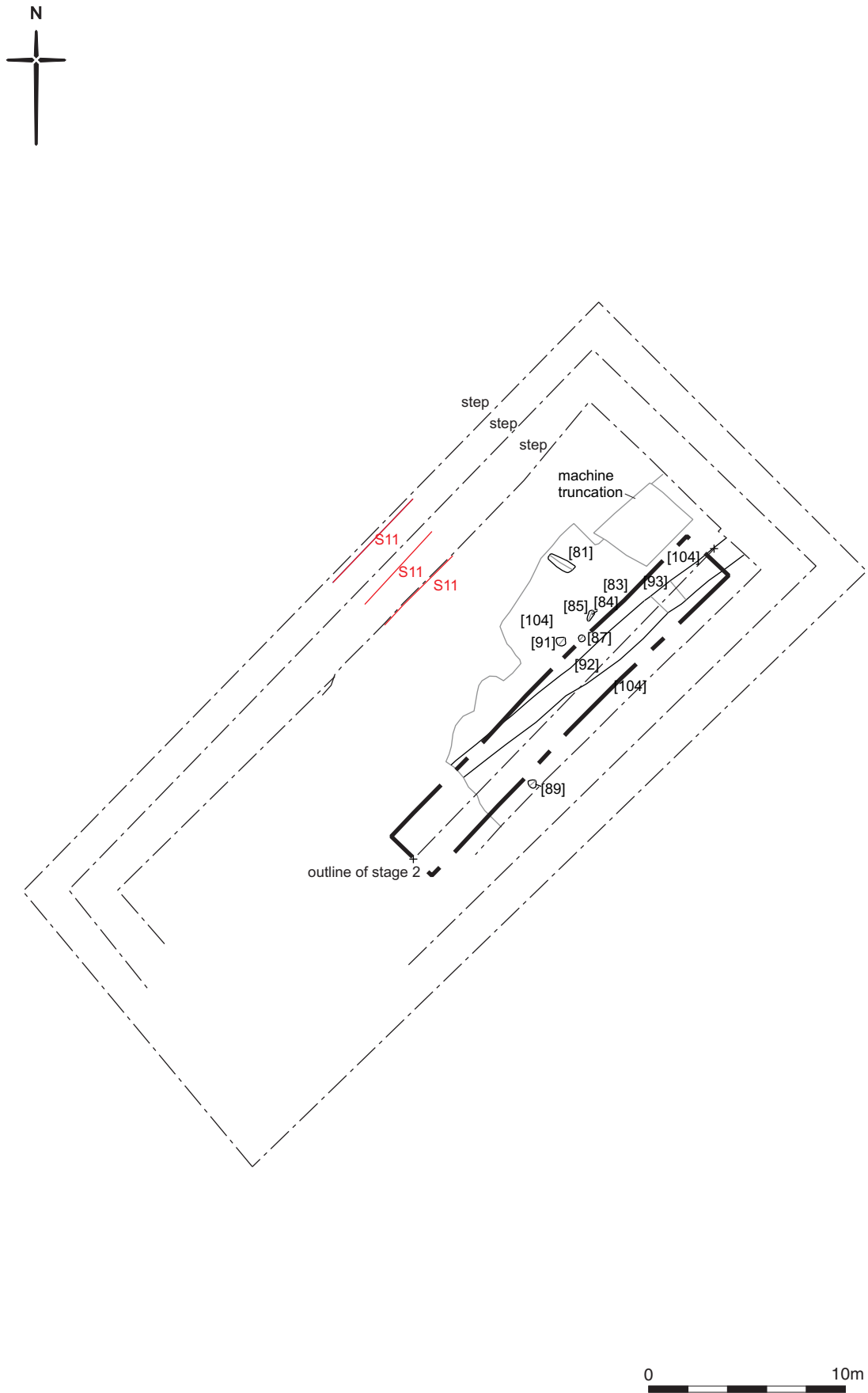


Fig 5 Plan of Trench PDZ8.04/5.35(C), stage 1

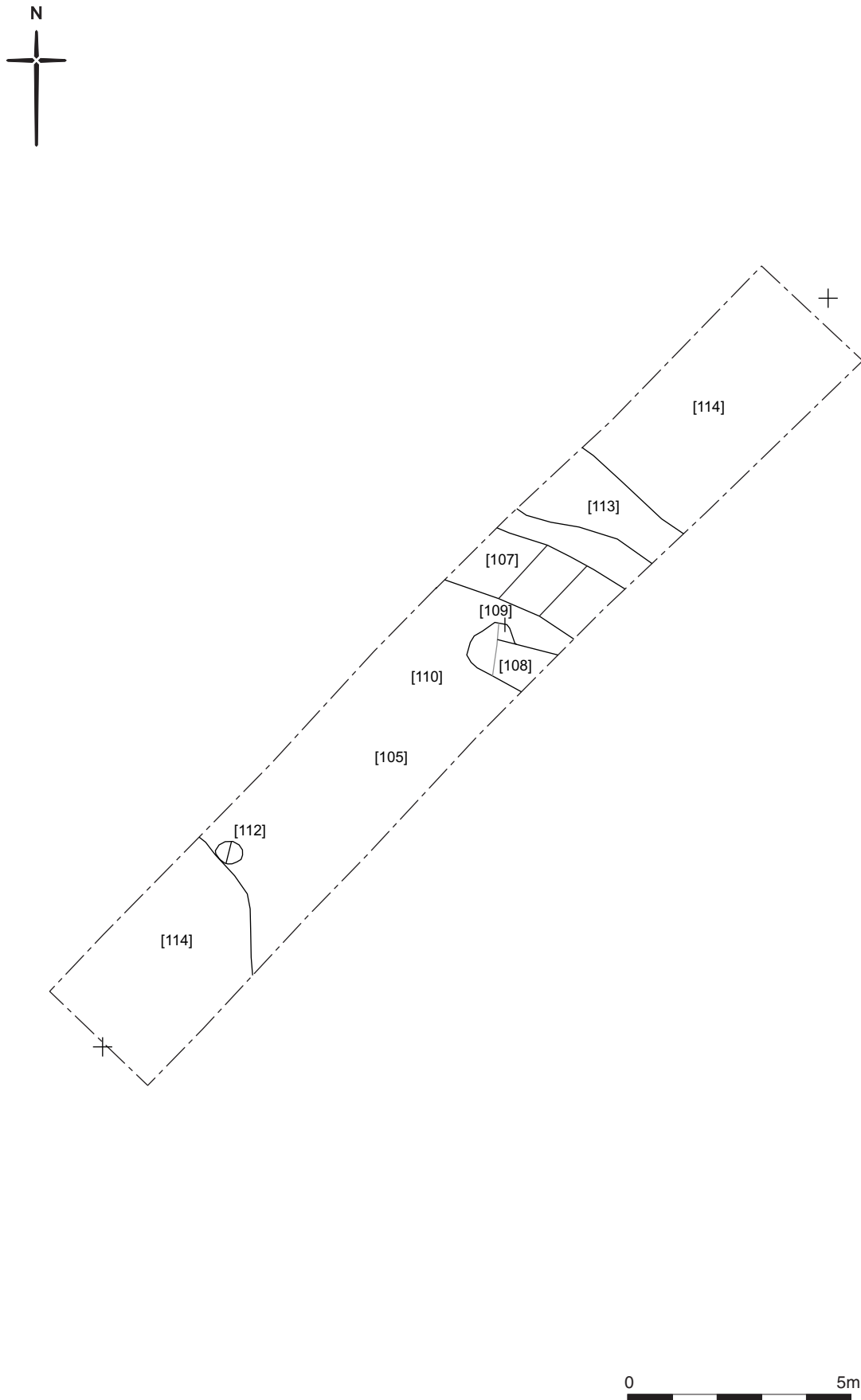


Fig 6 Base of Trench PDZ8.04/5.35(C), stage 2

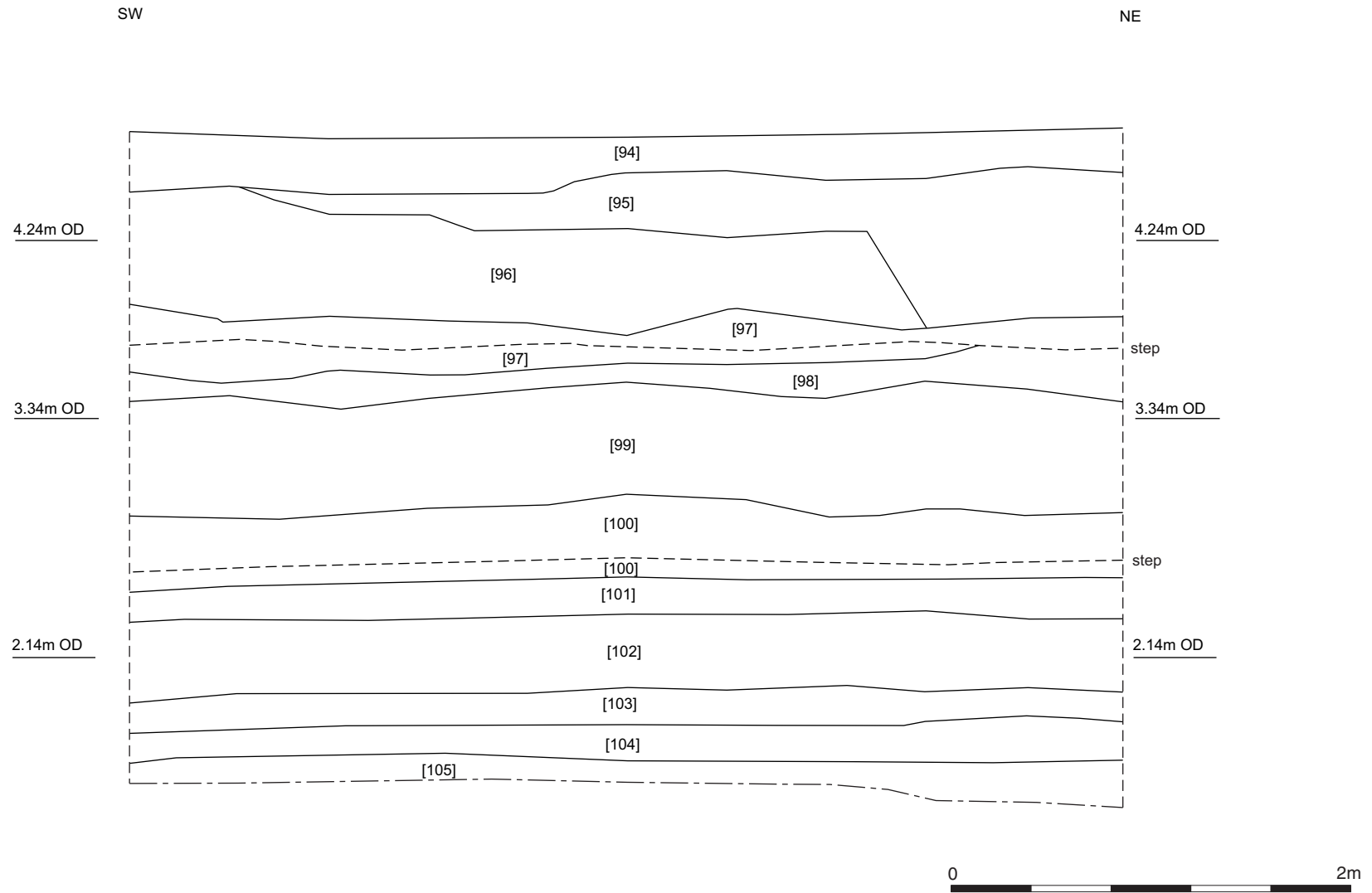


Fig 7 South-east facing section 11 of Trench PDZ8.04/5.35(C)

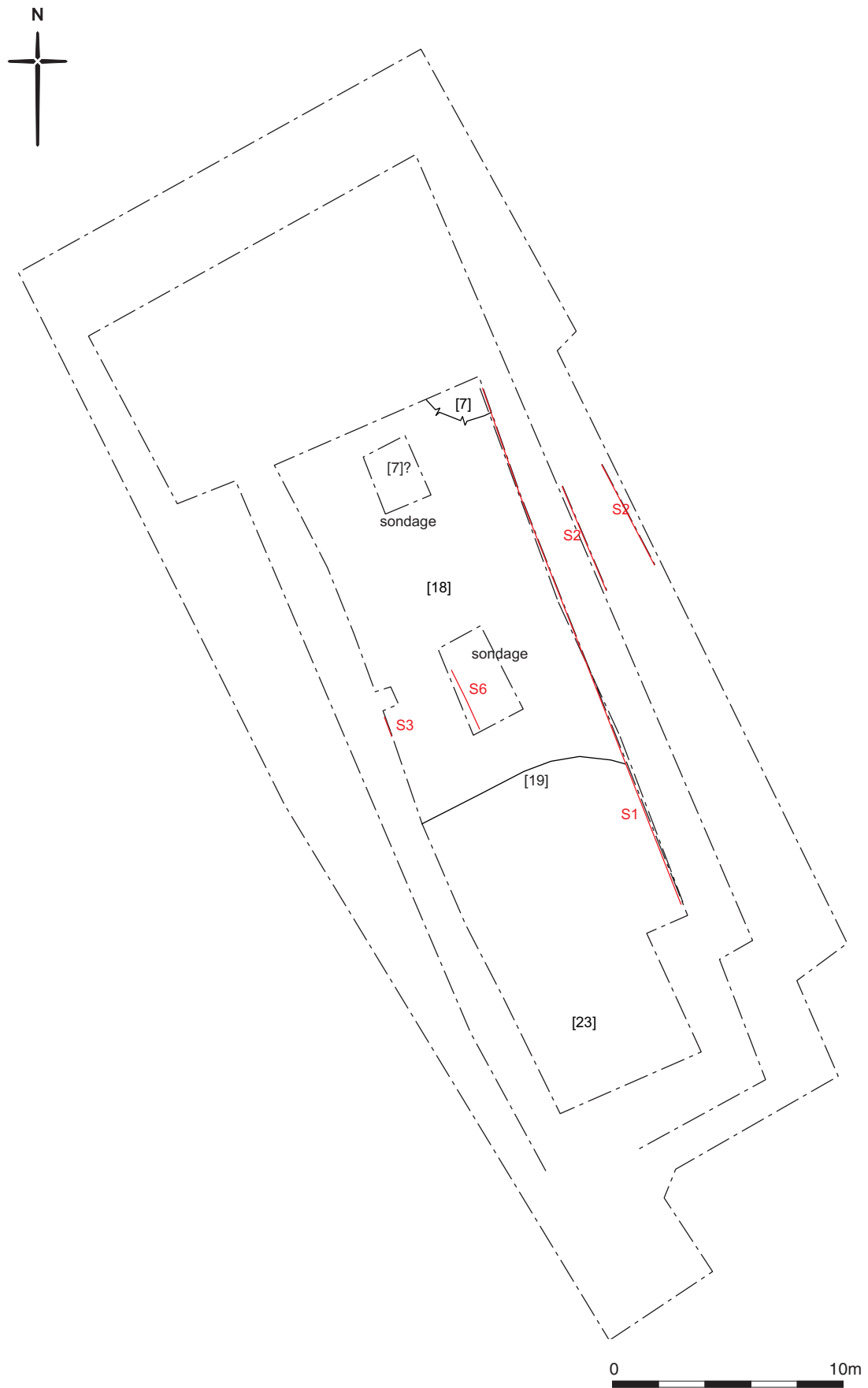


Fig 8 Plan of Trench PDZ5.36(C)

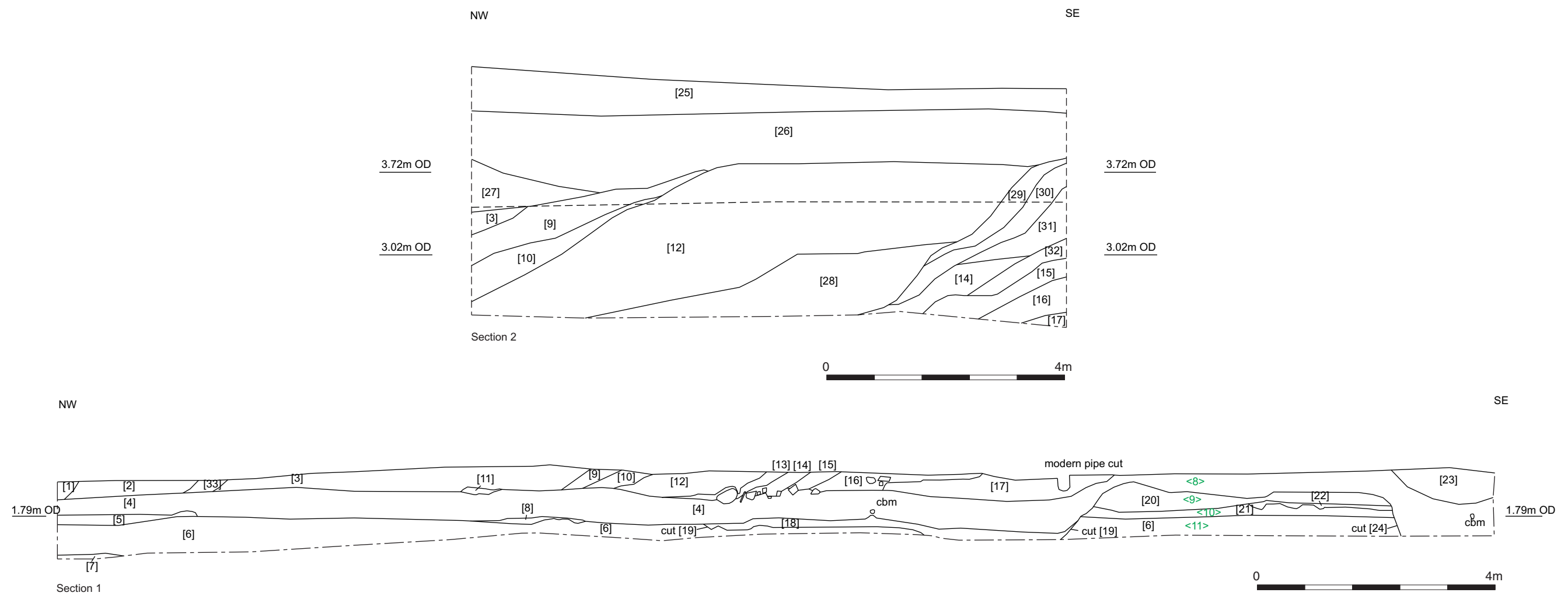


Fig 9 South-west facing sections 1 and 2 of Trench PDZ5.36(C)

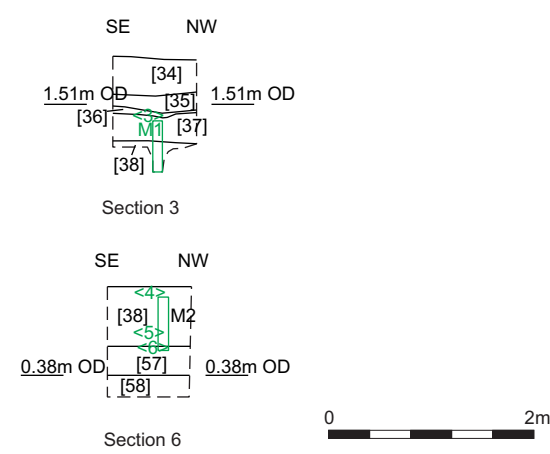


Fig 10 North-east facing sections 3 and 6 of Trench PDZ5.36(C)

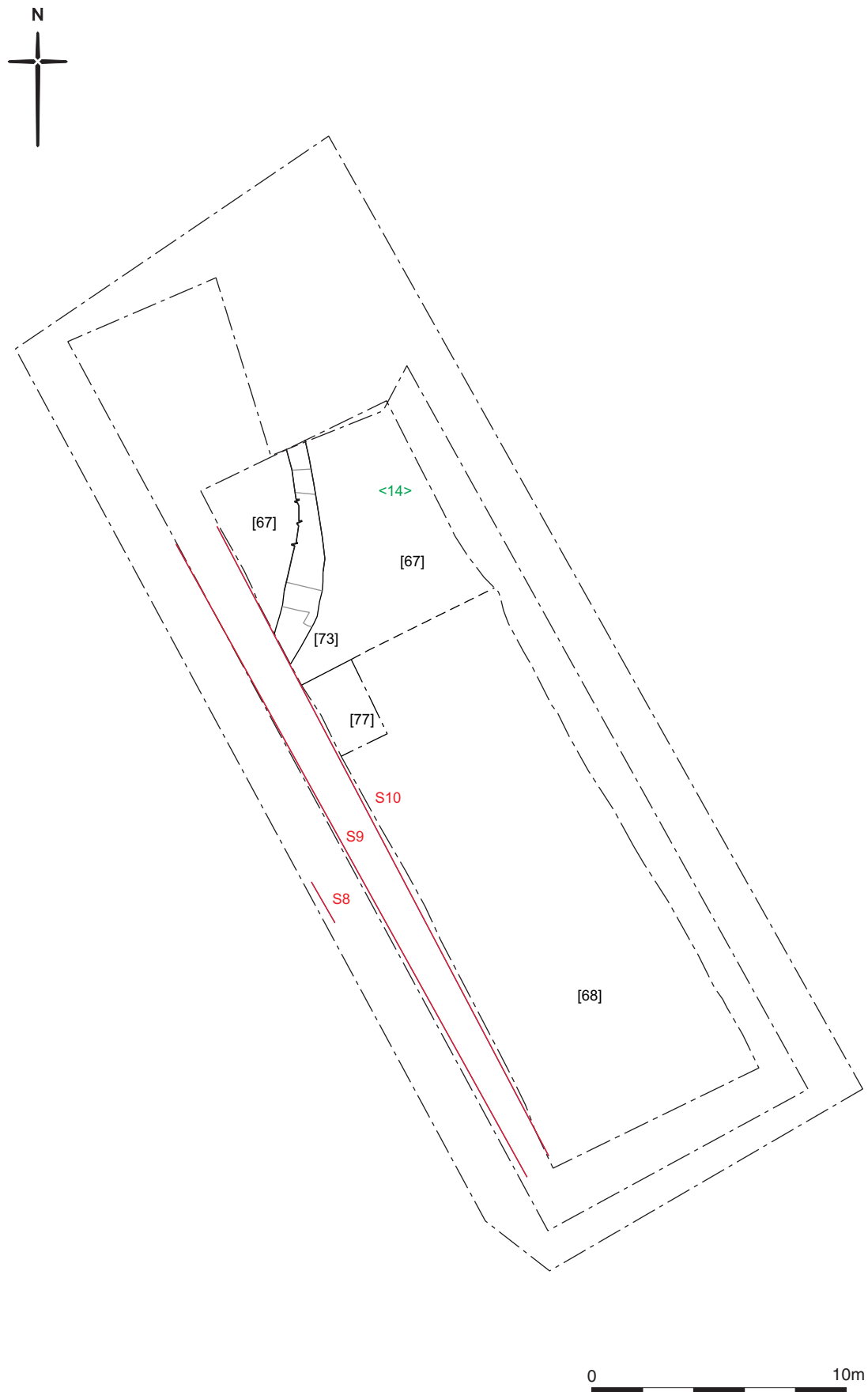


Fig 11 Plan of Trench PDZ5.41(C)

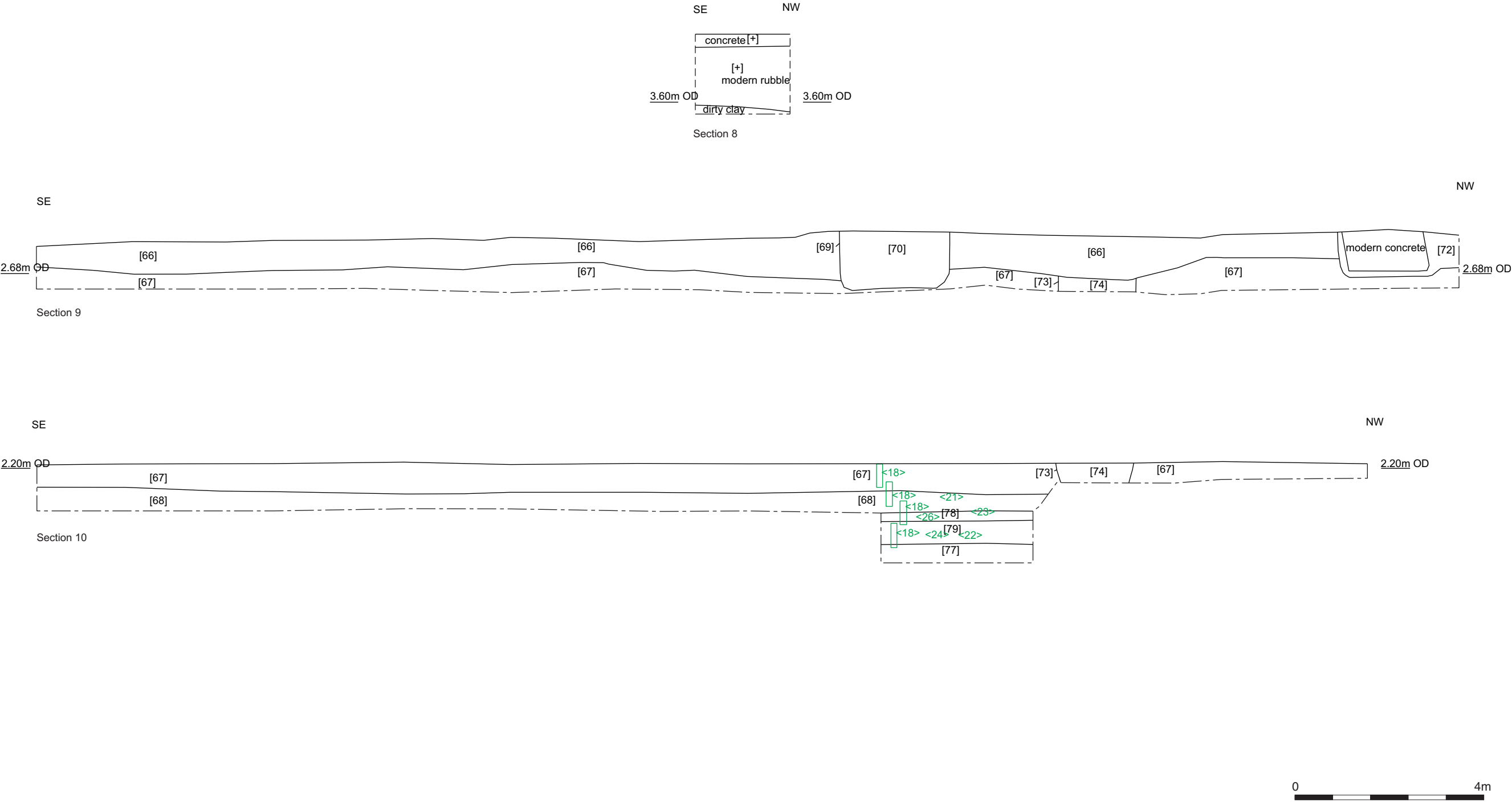


Fig 12 North-east facing sections 8, 9 and 10 of Trench PDZ5.41(C)

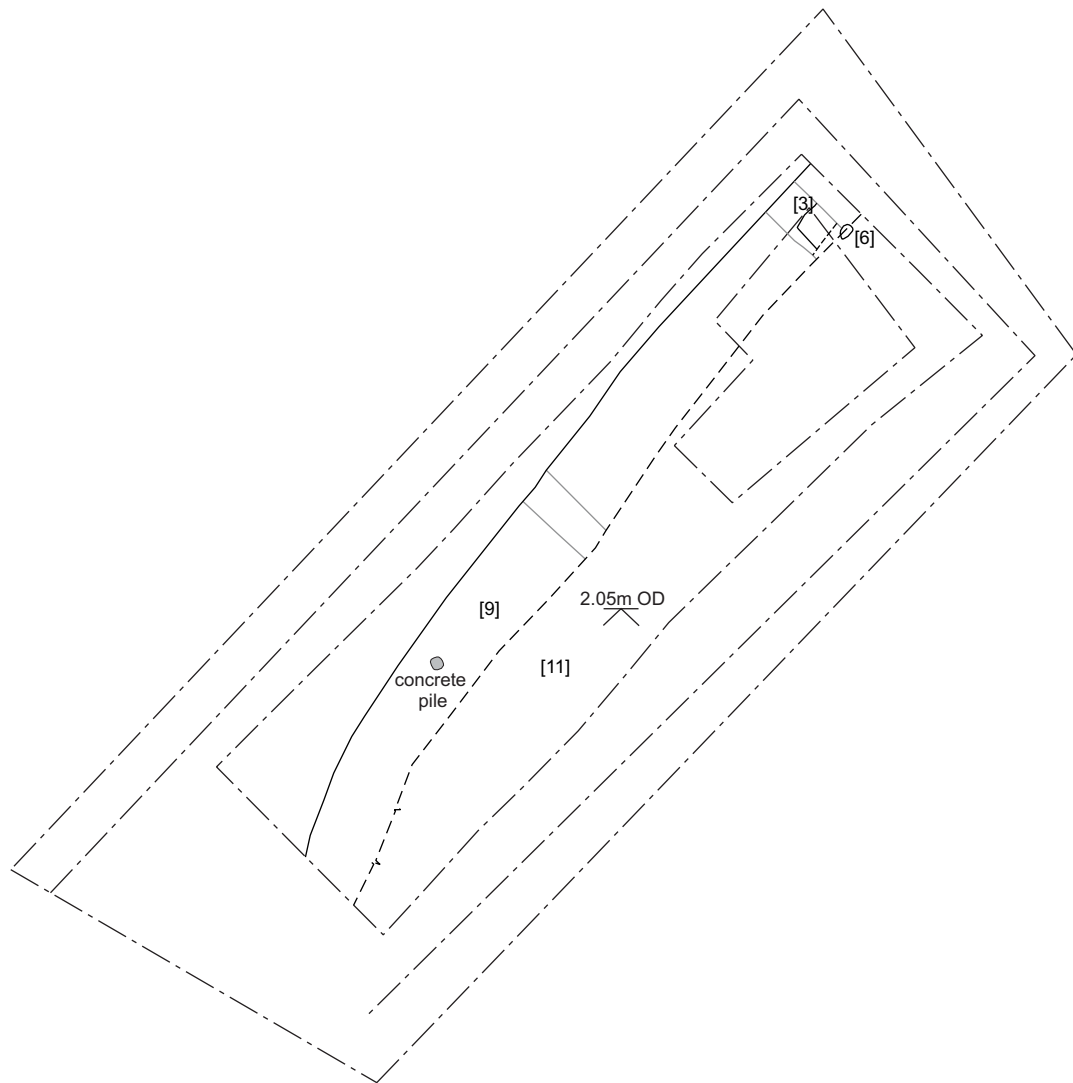


Fig 13 Base plan of Trench PDZ5.58(C)