East Thamesmead Business Park Bexley Greater London

Archaeological Evaluation Report

Oxford Archaeology

March 2005

Client:
Scott Wilson Kirkpatrick & Co Ltd

Issue No: 1
OA Job No: 2577
NGR: TQ 485 798

Client Name: Scott Wilson Kirkpatrick & Co Ltd

Client Ref No:

Document Title: East Thamesmead Business Park

Document Type: Evaluation

Issue Number: 1

National Grid Reference: TQ 485 798
Planning Reference:

OA Job Number: 2577
Site Code: ETB05
Invoice Code: ETBEV
Receiving Museum: Museum of London
Museum Accession No:

Prepared by:	Bryan Matthews
Position:	Supervisor
Date:	29th March 2005
Checked by:	Valerie Diez
Position:	Project Manager
Date:	31st March 2005
Approved by:	Stuart Foreman Signed……
Position:	Senior Project Manager
Date:	1st April 2005
Document File Location	Server1\ETBEV_East Thamesmead Business Park\Phase1_Evaluation&WB_ETBEV\Reports\Evaluation
Graphics File Location	Server10\oaupubs1AtoH*ETB05*ETBEV*East Thamesmead5
Illustrated by	Lucy Martin

Oxford Archaeology

Janus House
Osney Mead
Oxford OX2 0ES
t: (0044) 01865 263800 e: info@oxfordarch.co.uk
f: (0044) 01865 793496 w: www.oxfordarch.co.uk

Oxford Archaeological Unit Limited is a Registered Charity No: 285627

Scott Wilson Kirkpatrick & Co Ltd

East Thamesmead Business Park
Bexley
Greater London

NGR TQ 488 797

ARCHAEOLOGICAL EVALUATION

CONTENTS

LIST OF FIGURES

SUMMARY

Oxford Archaeology (OA) carried out a field evaluation of land at East Thamesmead, the Erith Marshes, south-east London, for Scott Wilson Kirkpatrick Ltd, acting on behalf of Tilfen Land. A total of ten trenches were excavated across the site. Nine of the trenches were dug to a maximum depth of 1.5 m. Trench 10 was excavated to a depth of 5 m below ground level in order to expose the base of the peat deposits. In addition, four purposive archaeological boreholes were excavated in order to sample the sediment sequence. No archaeological finds or deposits were found.

1 INTRODUCTION

1.1 Location and scope of work

1.1.1 In March 2005, Oxford Archaeology (OA) carried out an evaluation at East Thamesmead, the Erith Marshes, south-east London, for Scott Wilson Kirkpatrick Ltd, acting on behalf of Tilfen Land. This evaluation was part of the initial assessment of a proposed three phase development involving the construction of a business park totalling 63,200 m² of floor area, with carparking.

1.1.2 The development site lies at TQ 488 797, within the historic parish of Erith in Kent, situated within the London Borough of Bexley. The site is located on the former marshland of Erith, *c* 1.2 km to the south of the River Thames (Fig. 1).

1.1.3 Oxford Archaeology (OA) was commissioned by Scott Wilson Kirkpatrick Ltd in 2002 to undertake the Archaeology and Heritage chapter of the Environmental Impact Assessment. This study highlighted the potential for the development to affect palaeoenvironmental and archaeological remains in relation to Phase 1 of the development, which unlike Phases 2 and 3, has detailed planning permission. Phases 2 and 3 will be the subject of further assessment when the details of these phases are known.

1.1.4 A staged programme of evaluation has been agreed in principal with English Heritage to further assess the archaeological and palaeoenvironmental potential of the site. This consists of a programme of environmental sampling and trenches, targeted to investigate known features and deposits that will be affected by the development. This phase of evaluation was carried out as a condition of planning consent and will inform the need for any further mitigation work.

1.1.5 A design brief was discussed in consultation with Mark Stevenson, Archaeological Advisor for the Greater London Archaeology Advisory Service (English Heritage) and Jane Sidell, English Heritage Science Advisor (University College London).

1.1.6 This evaluation covers an area of approximately 2.52 ha., within the eastern end of the development area, and is designated as Zone B in the development plan (Fig. 2). It will be the location of three new buildings.

1.2 Geology and Topography

1.2.1 The site lies on the former marshland of Erith, c 1.2 km to the south of the River Thames and c 400 m from the gravel terrace. It lies between Eastern Road, to the north, Yarnton Way, to the south, and is adjacent to the western side of Waldrist Way. The evaluation area lay immediately to the south of a large Londis depot warehouse. The site comprises an open area of rough grazing, with a NNE-SSW aligned drainage channel to the west, and a slightly raised area west of the channel. The land just to the west of the channel was formerly part of the grounds of a riding school. A large horse training and exercise yard was still apparent in the northern part of this area. The ground level within the evaluation area varied between 0.18 m OD to the east and 0.96 m OD to the west.

1.2.2 The drift geology of this area is alluvium over Blackheath Beds in the northern part of the site and alluvium over Thanet Beds in the southern part of the site (BGS 271 & 257).

1.3 Archaeological and Historical Background

1.3.1 A detailed account of the archaeological, historical and palaeoenvironmental background and potential has been produced as part of the Environmental Statement (ES). The following sections represent only a summary of this data. Further details can be found in the Chapter 5 of the ES.

1.3.2 The site is situated on the former low-lying floodplain. The floodplain may have been suitable for settlement and other activities at various times during prehistory, but with rising sea levels would have turned to marshland, until sea defences were constructed and the land was reclaimed.

1.3.3 In the late Palaeolithic period to the middle Mesolithic, the site would have been dry ground. In the post-glacial period of the last 12,000 years, the landscape of the Thames Estuary saw a number of changes associated with sporadic rises in sea levellargely attributed to a rise in sea-level caused by the shrinking of the polar ice caps and tectonic subsidence. . The Lower Thames Valley was subject to a number of marine transgressions, during which low-lying areas beside the river became inundated with estuarine muds and clays, and marine regressions, when the land was characterised by plant growth and the formation of peat, with numerous small creeks.

1.3.4 From the Late Mesolithic period much of the floodplain would have been a wetland marsh landscape with numerous small creeks and fleets used by boats for access to the Thames. Although the low-lying wetland would have been prone to flooding, which would have made permanent occupation difficult, investigations elsewhere along the Thames Estuary have indicated that from the late prehistoric period to the medieval period (prior to reclamation) it would have been utilised extensively for a range of economic activities.

1.3.5 Past archaeological investigations within the area of Erith marshes below the later medieval and post-medieval alluvial deposits have discovered evidence of Mesolithic, Neolithic and Bronze Age activity relating to the exploitation and utilisation of the marshland landscapes. Such evidence includes flint tools of Mesolithic date, a Neolithic log boat (NMR 407927) the remains of Bronze Age prehistoric trackways (SMR 071351, 071352 and 071353) and a Romano-British farmstead (SMR 070515, NMR 408165).

1.3.6 The site contains no known archaeological sites as identified on the Greater London Sites and Monuments Record (GLSMR) and National Monuments Record (NMR) although a number of historic landscape features have been identified from aerial photographs, the walkover survey and studies of historic mapping. These include a possible sea wall, former paths, drainage ditches and field boundaries. These features are likely to date from the phases of marsh reclamation, in the medieval and post-medieval periods. Only two of these features have been spotted in Zone B of this evaluation phase. The first one is a field boundary and drainage channel still extant and visible on site and only partially filled up (first seen on 1843 Tithe map). The second one is a former field boundary and/or drainage channel (seen only on 1843 Tithe map).

1.3.7 The potential of the area is difficult to ascertain, as there are substantial alluvial deposits present which may well mask earlier archaeological remains. Also floodplains have the potential to contain well preserved archaeology with good preservation of organic structures and artefacts, and environmental deposits.

1.3.8 A ground investigation and geotechnical engineering assessment was undertaken in September 2004 by Soil Mechanics and included the drilling of eight cable percussion boreholes and nine machine dug trial pits. Made ground was encountered in all boreholes and trial pits except one, to a depth between 0.30 and 2.10 m (Soil Mechanics 2004). The thickness of alluvium ranged from 2.05 to 2.20 m. River Terrace Deposits were encountered in all boreholes at depths between 6.10 and 9.65 m. Groundwater was encountered in all boreholes, at depths between 2.10 and 9.60 m.

1.4 Aims of the Evaluation

1.4.1 To establish the presence/absence of archaeological and palaeoenvironmental remains within the proposal area.

1.4.2 To determine as far as possible the extent, condition, nature, character, quality and date of any archaeological or palaeoenvironmental remains present.

1.4.3 To establish any requirements for a further mitigation strategy.

1.4.4 To establish the ecofactual and environmental potential of archaeological deposits and features.

1.4.5 To make available the results of the investigation.

1.5 Methodology

1.5.1 Existing geotechnical borehole data was used to determine the best locations for purposive archaeological boreholes. Four boreholes were drilled under the supervision of a geoarchaeologist, during the initial stages of the evaluation, in order to investigate and retrieve samples from the full depth of Holocene alluvial deposits underlying the present ground surface at Thamesmead.

1.5.2 Trenches were excavated by mechanical excavators (a JCB and a 360° tracked excavator), fitted with toothless ditching buckets. This was supplemented by limited hand excavation of archaeological deposits for their initial dating and characterisation. The trenches were located to obtain a representative sample of the site. Trench 9 was placed to target a former field boundary/drainage channel observed on the 1843 Tithe map. Trench locations are illustrated on Figure 2.

1.5.3 Nine trenches, measuring 30 m x 1.8 m, were excavated. This represents a 2% sample of the proposed development area.

1.5.4 In the absence of significant archaeological horizons, these trenches were excavated to a maximum depth of 1.5 m , which represents the depth at which pile caps will be inserted.

1.5.5 The initial trenching and additional borehole information was used to assess the archaeological and palaeoenvironmental potential of the revealed deposits and to help determine the location of an additional trench, Trench 10. This trench was excavated down to the base of the underlying peat layer, in order to expose any evidence of cultural material. The exposed area was specified to be a minimum of 3 m by 3 m at the base of the peat. In practice this was achieved by the excavation of a large stepped trench, measuring 16 m x 16 m at ground level and approximately 3 m x 4 m at the base of the peat, which was found at *c* 5 m below ground level.

1.5.6 Within Trench 10, the peat deposits were carefully excavated in machined spits, which were inspected as work progressed. Where present, wood deposits were cleaned with a view to identifying any worked wood remains.

1.5.7 The stratigraphy of all trenches were recorded. The trenches were planned and their sections drawn at a scale of 1:20. Trenches and possible features were photographed using colour slide and black and white print film. Recording followed procedures laid down in the *OAU Fieldwork Manual* (ed D Wilkinson, 1992).

1.5.8 Monitoring of the evaluation was undertaken by Mark Stevenson, Archaeological Advisor for the Greater London Archaeology Advisory Service (English Heritage) and Jane Sidell, English Heritage Science Advisor (University College London).

1.6 Finds

1.6.1 No finds were recovered.

1.7 Palaeo-environmental evidence

1.7.1 A comprehensive sampling strategy was undertaken, and consisted of column, incremental and bulk sampling of the stratigraphic sequence within Trench 10 (see log sheet Trench 10, Appendix 4) together with the excavation of additional geo-archaeological and environmental boreholes across the site.

1.7.2 The four cores were split and logged by a qualified geoarchaeologist as part of this evaluation report in order to assess the sediment sequence and to identify the best profiles to be sampled for palaeoenvironmental remains. It is not intended to detail the results of the environmental assessment here, as they will be the subject of a separate report. The results of the geoarchaeological assessment are presented in Appendix 4.

1.8 Presentation of results

1.8.1 A general description of soils and ground conditions is given, and the distribution of archaeological deposits is stated. This is followed by a stratigraphic description of individual trenches, a description of the finds and a discussion and interpretation of the results.

1.8.2 A table giving details of individual contexts is provided in Appendix 1.

1.8.3 The detailed geoarchaeological descriptions of the four boreholes and of Trench 10 are presented in Appendix 4.

2 RESULTS: GENERAL

2.1 Soils and ground conditions

2.1.1 The site is located on the former marshland of Erith, *c* 1.2 km to the south of the River Thames.

2.1.2 Modern topsoil and made ground deposits were found within all trenches. Although previous ground investigation indicated that made ground/topsoil was encountered at 0.30 to 2.10 m depth (Soil Mechanics 2004), the archaeological trial trenches showed that these deposits varied from 0.35 m deep in the west to over 0.7 m deep towards the eastern end of the site. The topsoil and made ground deposits overlay alluvial clays which typically extended below 1.5 m bgl. Within Trench 10 the alluvium was found to be 2 m thick and here it overlay substantial peat deposits, which were up to 2.5 m thick.

2.1.3 During the evaluation ground conditions were generally good.

2.2 Distribution of archaeological deposits

2.2.1 No archaeological deposits were encountered.

3 RESULTS: DESCRIPTIONS

3.1 Description of deposits

3.2 *Trench 1*

3.2.1 Trench 1 was aligned WNW-ESE within the northern corner of Zone B. The trench partially cut a former large square horse training and exercise yard.

3.2.2 The lowest deposit was a grey clay alluvial (106), at a depth of 1.43 m bgl (-0.6 m OD). This was overlain by up to 0.9 m of brown clay (103) and 0.3 m of buried topsoil (102). Within the middle and eastern end of the trench, the buried topsoil was partially covered by a former horse exercise and training area, which consisted of made ground deposits and a covering of sandy grit (100). To the west, up to 0.2 m of modern topsoil deposit (101) overlay the buried topsoil horizon (Fig. 3).

3.3 *Trench 2*

3.3.1 Trench 2 was located close to the western corner of Zone B. It was aligned NNE-SSW within an area of mixed tarmac and disturbed ground associated with former stables buildings.

3.3.2 The top of a grey-brown alluvial clay (204) was encountered at a depth of 1.36 m bgl (-0.8 m OD). This was overlain by a layer of pinkish grey clayey silt (203), up to 0.3 m thick, 0.9 m of orange brown silty clay (202) and 0.38 m of made ground and tarmac (200).

3.3.3 The upper 0.2 m of the alluvial clay (202) was heavily stained by the made-ground and tarmac deposits above and were described as a separate context, 201.

3.4 *Trench 3*

3.4.1 Trench 3 was located close to the centre of Zone B and lay just to the east of a main NE-SW drain gully.

3.4.2 Within Trench 3 the earliest deposit was a grey clay alluvial (305). The top of this deposit was revealed at a depth of 1.33 m bgl (-1.16 m OD). It was intermittently overlain by thin spreads of dark brown peat (302) and orange sandy silt (303). These spreads measured up to 0.07 m and 0.1 m thick respectively. The spreads were overlain by 0.9 m of orange brown silty clay alluvial (301) and 0.45 m of mixed topsoil and made-ground deposits (Fig.3).

3.5 *Trench 4*

3.5.1 Trench 4 was aligned WNW-ESE, to the south of Trench 3 and east of the main NE-SW drain gully.

3.5.2 A brownish grey alluvial clay (402) was revealed at a depth of 1.1 m bgl (-0.68 m OD). It was overlain by 0.35 m of orange brown loamy silt (401), 0.25 m of orange brown silty clay (403) and 0.5 m of mixed topsoil and modern made-ground deposits (Fig.3).

3.6 *Trench 5*

3.6.1 Trench 5 was aligned WNW-ESE along the northern edge of the site.

3.6.2 A blue-grey clay (503) was revealed at a depth of 1.2 - 1.35 m bgl (-0.7 to -0.83 m OD). It was overlain by up to 0.15 m of sandy silt (502), 0.8 m of brown silty clay (501) and up to 0.3 m of mixed topsoil and modern made-ground deposits.

3.7 *Trench 6*

3.7.1 Trench 6 was aligned WNW-ESE within the centre of the site.

3.7.2 The earliest deposit was a yellow brown sandy silt (603), which was found at a depth of 1.4 m bgl (-0.92 m OD). This was overlain by 0.7 m of brown silty clay (602) and 0.8 m of mixed topsoil and modern made-ground deposits (600/601).

3.8 *Trench 7*

3.8.1 Trench 7 was placed to the south of Trench 6 on a NE-SW alignment.

3.8.2 A pale brown silty clay alluvial (702) was seen at a depth of 0.6 m – 0.65 m bgl (-0.92 m OD). The alluvial was overlain by up to 0.6 m of made-ground deposits (701) and up to 0.3 m of modern topsoil (700).

3.9 *Trench 8*

3.9.1 Trench 8 was aligned NNE-SSW within the eastern corner of Zone B.

3.9.2 An orange brown silty clay alluvial (802), was revealed at a depth of 1.1 – 1.2 m bgl (-0.37 m to -0.69m OD). Substantial made ground deposits (801/803) overlay the alluvium, and in the southern end of the trench these included some very large concrete slabs, which extended beneath 1.5 m bgl. Typically these made ground deposits measured up to 0.96 m thick. They were covered by 0.25 m of modern topsoil.

3.10 *Trench 9*

3.10.1 Trench 9 was aligned NW-SE within the southern corner of Zone B.

3.10.2 A blue-grey clay (904), which was revealed at 1.2 m bgl (-0.67 m OD). It was overlain by 0.66 m of orange brown silty clay (905).

3.10.3 Within the eastern end of the trench a large diameter drainage pipe was found at a depth of 0.96 m bgl. The pipe appeared to be aligned north-south across the trench. The pipe trench extended across most of the eastern end of the trench and cut alluvial deposits 904 and 905. Its backfills consisted of re-deposited orange brown alluvial clays (906) and a brown clay loam (902), containing much dumped concrete and brick. The trench was sealed by a modern topsoil that was up to 0.5 m thick (Fig.3).

3.11 *Trench 10*

3.11.1 Trench 10 was placed between Trenches 7 and 9. It measured 16 m x 16 m square at ground level and was machined in a series of stepped sections, down to the base of the underlying peat, at 5 m bgl (- 4.38 m OD). At this level an area measuring 4 m x 3 m was exposed (Figs. 4 and 5). The stratigraphic units (SU) cited below refer to the units described in the geoarchaeological assessment (Appendix 4) to allow correlation between the two descriptions.

3.11.2 Within Trench 10, a clean grey clay (15- SU 3), was uncovered at a depth of 5 m bgl. This was overlain by up to 2.26 m of layered peat deposits (8, 9 10, 11, 12, 13 and 14 - SU 4). The peat was excavated in machined spits under close supervision and inspected for the presence of possible occupation horizons or worked timbers, but none were found.

3.11.3 The peat was overlain by 0.9 m of grey and orange grey alluvial clays (5, 6,and 7 - SU 5). These were in turn overlain by a thin intermittent deposit of peat (4 - SU 5) and up to 0.2 m of orange sandy clay (3 - SU 5). This sandy clay layer is thought to relate to a similar ‘high energy’ deposition seen within the other evaluation trenches.

3.11.4 The sandy clay (3) was overlain by 0.9 m of orange brown alluvial clay (2) and 0.6 m of modern made-ground deposits (SU 6).

3.12 **Finds**

3.12.1 The modern deposits encountered contained frequent brick and concrete fragments as well as other modern debris. This was noted but not retained. No significant archaeological finds were recovered.

3.13 **Palaeo-environmental remains**

3.13.1 The palaeoenviromental assessment of the site is the subject of a separate report.

4 DISCUSSION AND INTERPRETATION

4.1 Reliability of field investigation

4.1.1 The results from across the site were consistent and indicate a general lack of archaeological activity within the present evaluation area.

4.1.2 Despite inclement weather, with occasional snow and rain, the archaeological working conditions can be described as fair to good. Where localised flooding within trenches did occur, it was gradual and limited in extent, and did not seriously impede the evaluation.

4.1.3 All deposits were inspected and particular attention was paid to possible interface or occupation horizons, and to revealed wood deposits, but none were identified.

4.1.4 The absence of any archaeological finds also indicates a lack of nearby archaeological activity, although, within the peat horizons, such activity can be very localised.

4.2 Overall interpretation

Summary of results

4.2.1 The sequence of deposits uncovered was fairly consistent across the site. A former topsoil / subsoil horizon was apparent within Trench 1, where it was overlain by the made ground for a former horse exercise and training area. Elsewhere orange brown and grey alluvial clays were found beneath modern made ground and topsoil deposits. The general absence of buried topsoil or subsoil horizons indicates that the majority of the site had been previously stripped and subsequently levelled up.

4.2.2 The land drain found in Trench 9 was aligned north-south and is on the same alignment than a former field boundary/drainage ditch (see 1.3.6). It is possible that the cut for this earlier feature was reused as a later date or that the more modern drain pipe was inserted along the same alignment that the former linear feature.

4.2.3 Trench 10 was machined to the bottom of the underlying peat deposits, with a view to identifying possible evidence of prehistoric activity, such as worked timbers, trackways, or struck flints, but none was found.

4.2.4 No archaeological finds or deposits were identified within any of the evaluation trenches.

Significance

4.2.5 In archaeological terms the evaluation area can be described as being of little significance.

4.2.6 Initial examination of the sediment sequence suggests significant potential for preserving a detailed record of the environmental development of the Lower Thames

floodplain at this location, possibly covering a period from the late Mesolithic period onwards. The worked carried out thus far has served well to characterise the gross morphology of the subsurface stratigraphy. However, although these sequences are of value in contributing to the overall regional picture of the development of the floodplain, it must be stressed that at the site level their value would be greatly enhanced if found to be directly associated with archaeological remains.

Appendix 1 Archaeological Context Inventory

Context	Type	Description	Depth (m)	Finds	Date
Trench 1					
100	Layer	Made ground	0.3		Modern
101	Layer	Topsoil	0.2		
102	Layer	Buried topsoil	0.3		
103	Layer	Alluvial?	0.9		
104	Layer	Made ground	0.4		
105	Layer	Sandy silt interface layer	0.12		
106	Layer	Alluvial?	Unknown		
Trench 2					
200	Layer	Tarmac/made ground	0.35		Modern
201	Layer	Alluvial staining	0.2		
202	Layer	Upper alluvial	0.9		
203	Layer	Interface layer	0.2		
204	Layer	Alluvial	>0.2		
Trench 3					
300	Layer	Topsoil/made ground	0.4		Modern
301	Layer	Upper alluvial	0.8		
302	Layer	Peaty silt	0.07		
303	Layer	Silty sand	0.1		
304	Layer	Alluvial	Unknown		
305	Layer	Alluvial	Unknown		
Trench 4					
400	Layer	Made ground	0.5		Modern
401	Layer	Upper alluvial	0.36		
402	Layer	Interface layer	>0.5		
403	Layer	Alluvial	0.24		
Trench 5					
500	Layer	Topsoil/ made ground	0.3		Modern
501	Layer	Upper alluvial	0.8		
502	Layer	Sandy silt	0.15		
503	Layer	Alluvial	0.3+		
504	Layer	Sandy peat lenses	0.03		
505	Layer	Modern culvert	0.3+		Modern
506	Layer	Modern culvert fill	0.3+		Modern
Trench 6					
600	Layer	Topsoil	0.2		Modern
601	Layer	Made ground	0.6		Modern
602	Layer	Upper alluvial	0.7		
603	Layer	Alluvial	>0.1		
Trench 7					
700	Layer	Topsoil	0.3		Modern
701	Layer	Made ground	0.3		Modern
702	Layer	Upper alluvial	>1.0		
Trench 8					
800	Layer	Topsoil	0.25		Modern
801	Layer	Made ground	0.75		Modern
802	Layer	Upper alluvial	>0.5		
803	Layer	Made ground	Unknown		Modern

Context	Type	Description	Depth (m)	Finds	Date
Trench 9					
900	Layer	Topsoil/made ground	0.8		Modern
901	Fill	Backfill of drain	0.15		Modern
902	Fill	Backfill of drain	>1.45		Modern
903	Cut	Drain culvert trench	>1.45		Modern
904	Layer	Alluvial			
905	Layer	Alluvial	0.67		
906	Layer	Alluvial	0.85		
1	Layer	Topsoil/ made ground	0.6		
2	Layer	Upper alluvial	0.7		
3	Layer	Interface layer	0.08		
4	Layer	Black peat	0.04		
5	Layer	Alluvial	0.2		
6	Layer	Alluvial	0.58		
7	Layer	Alluvial	0.2		
8	Layer	Black peat with clay	0.3		
9	Layer	Brown peat	0.5		
10	Layer	Reddish black peat	0.1		
11	Layer	Brown peat	0.6		
12	Layer	Reddish brown peat	0.02		
13	Layer	Black peat	0.4		
14	Layer	Brown reedy peat	0.22		
15	Layer	Grey clay	>0.4		

Appendix 2 Bibliography and references

IFA 1992 *Standard and Guidance for Archaeological Evaluations*

OA 2005 *East Thamesmead Business Park, Written Scheme of Investigation for an Archaeological Evaluation and watching brief*. Prepared by OA for Scott Wilson Kirkpatrick & Co Ltd

OA 2002 *East Thamesmead Business Park, Environmental Impact Assessment*. Prepared by OA for Scott Wilson Kirkpatrick & Co Ltd

OAU Fieldwork Manual (ed D Wilkinson, 1992)

Soil Mechanics 2004 *Innovation Centre, East Thamesmead Business Park, Volume 2: Ground investigation and Geotechnical engineering assessment*. Prepared by Soil mechanics for Bexley Council

Appendix 3 Summary of Site Details

Site name: East Thamesmead Business Park
Site code: ETB 05
Grid reference: TQ 488 797
Type of evaluation: Nine evaluation trenches and a single larger 16 m x 16 m area excavation, box in to 3 m x 4 m at the base of underlying peat deposits (5 m beneath ground level).
Date and duration of project: 3 weeks, February 2005
Area of site: 2.52 ha
Summary of results: No significant archaeological remains
Location of archive: The archive is currently held at OA, Janus House, Osney Mead, Oxford, OX2 0ES, and will be deposited with the Hall Place Museum in due course

Appendix 4 Geoarchaeological and Environmental Assessment

by V. Yendell and E.C. Stafford (Oxford Archaeology)

Introduction

As part of the evaluation strategy four purposive boreholes were drilled across the site in order to investigate and retrieve samples from the full depth of Holocene alluvial deposits underlying the present ground surface at Thamesmead. The proposed development will involve displacement piling, which may significantly effect deposits lying at depth in waterlogged anaerobic conditions. The stratigraphic data and samples retrieved from the boreholes, supplements that retrieved from the deep excavation in trench 10 and the shallower sequences exposed in the remaining trenches.

Methodology

The boreholes were drilled in four locations using a standard percussion Terrier rig. The choice of location was determined by the data retrieved from the trenching, and examination of previous geotechnical records, with the aim of retrieving a representative sample of the site stratigraphy. The use of the Terrier rig allowed the retrieval of cores measuring 10cm diameter recovered in 1.0m lengths, providing adequate sediment for both stratigraphic description and assessment for palaeoenvironmental materials. The cores were returned to OA premises, extruded, and logged.

Results

The evidence from the boreholes revealed that a range of different sediment types are present throughout the site. A number of commonly occurring stratigraphic units have been identified as follows

Unit		
6	MG	Made Ground
5	UC-S	Upper Clay Silt
4	P/O	Peat/Organic Deposits
3	LC-S	Lower Clay Silt
2	G	Gravel
1	B	Bedrock

Bedrock: The underlying bedrock across the site is recorded as Upper Chalk and Thanet Beds (BGS Map Sheet 257). None of the purposive boreholes however were drilled deep enough to expose these deposits.

Gravels: Coarse sandy gravels appear to extend across the whole site overlying bedrock and sealed by Holocene alluvial deposits. The base of the gravels was not penetrated in any of the purposive boreholes. Previous geotechnical data however records depths of down to -20m OD (Soil Mechanics Report N0 G4020). The surface of the gravels is recorded at between -7.25m to -4.6m OD, with the lowest elevations towards the east (BH 100). The coarse grained character of the deposits suggests accumulation under cold climate periglacial conditions within high energy braided streams. Any archaeological remains identified within these deposits are likely to be reworked by fluvial processes.

Lower Clay Silt. The extent of this unit is variable across the site. It is thickest in the south-eastern and north-western sectors of the site and is associated with the lowest elevations in

the surface of the gravels to the east. It is generally described as a minerogenic bluish grey to greenish grey silty-clay ranging from 1.45 to2.65m in thickness. This deposit generally lies at elevations of -4.00m to -7.25m OD to the south-east. It is significantly reduced in thickness westwards lying at -3.15m to -4.60m OD where it becomes increasingly organic with woody inclusions. The fine-grained nature of the deposits represents fairly low energy deposition. Any archaeological material present within these deposits may be considered relatively in situ, although a low level of lateral transport. may have occurred adjacent to active channels.

Peat/Organic deposits. These deposits contained varying amounts of plant and woody material. Deposits thicken in the central part of the site (BH103) to a maximum thickness of 2.70m. The base of the major peat/organic unit varied from -4.40m to -3.15m OD across the site, and the top between -2.05 and -1.3m OD. The presence of these peats suggests phases of alder carr with the more reedy, organic/minerogenic parts of the sequence representative of wetland environments such as reed swamp. In parts of the sequence the texture of the peats varied, from wood peat to reed peat. The wood peat tended to occur towards the base of the sequences. Sediment input is apparent, particularly within the upper levels in the form of lenses of clayey peat, organic silt-clay and fine sand. This is likely to represent periodic flooding deriving from active channels. The presence of the sand lenses in particular suggests the proximity of a channel. Any associated archaeological material is likely to have suffered very little modification in terms of lateral transport, particularly in the more organic parts of these deposits, however some level of reworking is to be expected where sediment input is in evident adjacent to channels.

Upper Clay Silt. These deposits consist of silt clays with evidence of root action and weathering of the upper surface. The deposits extend across the entire site and thicknesses ranged from 1.52m to 2.55m with the base of the unit at -1.30m dropping to -2.05m OD towards the south-eastern sector of the site. These deposits represent the most recent episode of sedimentation associated with the Thames floodplain. The fine-grained nature of these deposits indicates low energy deposition. Any archaeological material present within these deposits may have suffered low-level lateral movement.

Made Ground. Extensive deposits of made ground exist across the majority of site, occurring in every trench, although only present in BH100 and 102. The type of made ground varies considerably and includes deposits containing brick, ash, concrete and organic material. The thickness varies between 0.16 and 0.63m. The greatest thickness, however, is concentrated towards the south-east and north-west. In the east of the site at the base of the made-ground the underlying alluvium appeared to have undergone some disturbance and possible truncation in the uppermost levels. To the west, the area had recently been used as a horse paddock. Here concrete foundations were clearly visible truncating the underlying alluvium to a depth of on average 0.5-1.0m. Modern ground levels across the site averaged + 0.18 to +0.85 m OD.

Discussion and Potential

The sediment sequences recorded from the boreholes are generally consistent with those recorded during previous geotechnical investigations across the site. Superficially they are consistent with the typical tri-partite Lower Thames sequence of gravel overlain by clay-silt/peat/clay-silt. Similar sequences have been recorded during investigations of a number of sites on the lower Thames floodplain in recent years.

The sandy gravels at the base of the sequence are almost certainly of Pleistocene age. The Pleistocene deposits of the Lower Thames have been extensively studied (Gibbard 1985,

1994, Bridgland 1994). Deposition in the Thames Valley began in the late Anglian stage (circa 500,000 BP.) and continued intermittently throughout the Pleistocene. Sediments, deposited in cold climate braided steam systems, exist as wedges of sand and gravel on the valley sides, subsequently eroded by fluvial incision during periods of lowered sea level to create terraces. The most recent episodes of gravel deposition formed the Shepperton gravels in the valley bottom.

During the early Holocene the landscape of the Lower Thames floodplain saw a number of changes, largely attributed to a rise in sea-level caused by the continued shrinking of the polar ice caps and tectonic subsidence. Within the inner estuary Holocene sediments consist of complex sequences of minerogenic and organic clay, silts, sands and peats, deposited in a variety of environments representing variously alder carr, fen, reedswamp, intertidal saltmarsh and mudflats.

The currently adopted stratigraphic sequence for the Lower Thames is based on work undertaken by Devoy (1977, 1979, 1982). Borehole stratigraphies were integrated with biostratigraphic studies to infer successive phases of marine transgressions (Thames 1-V) represented by clay/silt units and regressions (Tilbury 1-V) represented by peat units. Devoy constructed two age-altitude curves of relative sea level movement, one for Tilbury (outer estuary) and one for Crossness, Dartford and Broadness (inner estuary). The model suggests transgressions occurred in the Palaeolithic/early Mesolithic periods, the late Mesolithic/early Neolithic periods, throughout the Bronze Age, in the middle Iron Age and at the beginning of the 4th century AD (Devoy 1980). The 'Thames-Tilbury' model is regarded as the seminal work in this area (Haggart 1995) and has been widely applied by researchers outside the original study area in the absence of regional models. However, recent work (Haggart 1995 in Sidell et al 2000:16) has highlighted several problems, such as the need for two age/ altitude curves, suggesting it cannot always be easily applied to the whole of the Thames Estuary, both in terms of lithology and age/ altitude analysis. (Sidell et al 2000:16). This reflects the complex nature of the floodplain environment during this period, consisting of peat forming communities, migrating channels and sand eyots (Sidell 1998). Bates (1998,1999, 2000, 2004) points out that Devoy's work has resulted in a view of sediment accumulation being controlled within the area by a combination of factors dominated by sea-level change and tectonic depression, taking no account of palaeogeography, sedimentary basin size and local to regional sedimentation.

On initial examination of the Thamesmead data the elevations of the surface of the gravels exhibit considerable variation. The highest elevations were recorded in the central and western areas with a corresponding drop in elevations to the east. It is possible that the low-lying area to the east represents the location of a palaeochannel. The surface of the gravels essentially defines the topography of the early Holocene landscape. Bates (1998) refers to this as the 'topographic template' and suggests that variations in the template largely dictated the patterns of subsequent landscape evolution, as flooding ensued during the later prehistoric period. A model proposed by Bates and Whittaker (2004), based on radiocarbon dated age/altitude data for the lower Thames, allowed age estimates to be applied to the onset of initial flooding, based on the elevation of the surface of the gravels. This model suggested that inundation of former dryland surfaces lying at c-7m OD commenced around 6500 BP reaching datums of -4m around 5600 BP. This suggests for a large part of the site only archaeological remains dating to the Mesolithic and early Neolithic periods may be found directly associated with the surface of the gravels. In the central area of the site where the surface of the gravels are elevated, inundation would have been slightly later than in the lower lying areas. As such they may have acted as a focus for human activity.

The minerogenic and organic sequences are most certainly of Holocene age. A major peat unit exists, lying between -4.40 m and -1.30m OD, reaching thicknesses of up to 2.70m. It is probable that these deposits relate to Devoy's Tilbury III and Tilbury IV peats and are of Neolithic and Bronze Age. Caution, however, must be used in correlating deposits with the Thames/Tilbury model in the absence of corroborative radiocarbon dates.

Initial examination of the sediment sequence suggests significant potential for preserving a detailed record of the environmental development of the Lower Thames floodplain at this location, possibly covering a period from the late Mesolithic period onwards. The work carried out thus far has served well to characterise the gross morphology of the subsurface stratigraphy. Logging of the cores retrieved from the boreholes has revealed that significant variations exist both spatially and temporally within and between the major stratigraphic units. Such variations were not recorded in the logs examined from previous geotechnical ground investigations. Both the minerogenic units and organic units exhibit much complexity which may well be associated with very local factors such as the proximity of the gravel terrace, undulations in the basal topographic template and local drainage patterns (Bates 1998, Bates et al 2000, 2004). The site appears to be located adjacent to a possible palaeochannel to the east of the site. Further interrogation of the stratigraphy, analysis of environmental indicators and a programme of radiocarbon dating would undoubtedly be able to refine the sequence. Due to the waterlogged conditions it is envisaged that environmental remains such as pollen, diatoms, plant macro-remains and insects will on the whole be well preserved.

Since Devoy's original work, a considerable number of investigations have taken place within the region. Often these are associated with developer-funded archaeological investigations. A number of Bronze Age trackways have been identified on the north bank of the Thames in East London (Meddens 1996) and Neolithic sites both on the north and south bank (Wessex Archaeology 1994, Masefield 1997). Other investigations have focused on environmental change (Haggart 1995, Long 1995, Sidell et al 2000, Wilkinson et al 2000, Sidell 2003). Bates and Whittaker (2004) however note that despite these investigations only a few sites relate to the earlier parts of the Holocene; the Mesolithic and Neolithic periods.

Although the sequences at Thamesmead are of value in contributing to the overall regional picture of the development of the floodplain, it must be stressed that at the site level their value would be greatly enhanced if found to be directly associated with archaeological remains. During this phase of work no archaeological remains were encountered. It is however possible that remains may be uncovered in other areas of the development during future phases of work. In addition further environmental work may reveal indirect evidence of local activity from the analysis of plant macro remains, pollen and other proxy indicators. For this reason the opportunity was taken to recover intact sediment cores suitable for analysis.

References

Bates, M.R.	1998	Locating and evaluating archaeology below the alluvium: the role of sub-surface stratigraphic modelling. *Lithics* 19: 4 – 18.
Bates, M.R. and Bates, C.R.	2000	Multidisciplinary approaches to the geoarchaeological evaluation of deeply stratified sedimentary sequences: examples from Pleistocene and Holocene deposits in southern England, United Kingdom. *Journal of Archaeological Science* 27: 845 – 858.
Bates, M.R. and Whittaker, K.	2004	Landscape evolution in the Lower Thames Valley: implications for the archaeology of the earlier Holocene period, in J Cotton, D Field (eds.) *Towards a New Stone Age: Aspects of the Neolithic in South-East England.* CBA Research Report 137
Bridgland, D.R.	1994	*Quaternary History of the Thames*. Geological Conservation Review Series. Chapman and Hall: London.
Devoy, R.J.N.	1977	Devoy, R.J.N. 1977 Flandrian sea-level changes in the Thames Estuary and the implications for land subsidence in England and Wales. *Nature* 220: 712-715.
Devoy, R.J.N.	1979	Flandrian sea-level changes and vegetational history of the Lower Thames Estuary. *Philosophical Transactions of the Royal Society of London* B285: 355-407.
Devoy, R.J.N	1982	Analysis of the geological evidence for Holocene sea level movements in Southeast England. *Proceedings of the Geologists' Association* 93: 65-90.
Gibbard, P.L.	1985	*Pleistocene history of the Middle Thames Valley*. Cambridge University Press: Cambridge.
Gibbard, P.L.	1994	*Pleistocene history of the Lower Thames Valley*. Cambridge University Press: Cambridge.
Haggart B.A.	1995	A re-examination of some data relating to Holocene sea-level changes in the Thames Estuary. In: Bridgland, D.R., Allen, P, and Haggart, B.A. (Eds.), *The Quaternary of the Lower Reaches of the Thames. Field Guide*. Durham: Quaternary Research Association, 329-338.
Long, A.J.	1995	Sea-level and crustal movements in the Thames estuary, Essex and East Kent, in D R Bridgland *et al*, 99-105
Masefield, R.	1997	*Erith to Thamesmead Spine Road Archaeological Investigations*. London: RPS Clouston

Meddens, F.	1996	Sites from the Thames estuary wetlands, England, and their Bronze Age use. *Antiquity* 70: 325-34
Sidell, J.	2003	*Holocene sea level change and archaeology in the river Thames estuary*. London, UK, unpublished Ph.d Thesis, University of Durham, 2 volumes.
Sidell, J., Wilkinson K., Scaife, R and Cameron, N.	2000	*The Holocene. Evolution of the London Thames: archaeological excavations (1991-1998) for the London Underground Limited Jubilee Line Extension Project.* Museum of London Archaeological Service Monograph.
Wessex Archaeology	1994	*Fort Street (West), Silverton, London, E16: Archaeological Assessment Report*. Unpublished Report. Salisbury: Wessex Archaeology
Wilkinson, K.N., Scaife, R.G., and Sidell, E.J.	2000	Environmental and sealevel changes in London from 10,500 BP to the present: a case study from Silverton. . *Proceedings of the Geologists' Association* 111: 41-54.

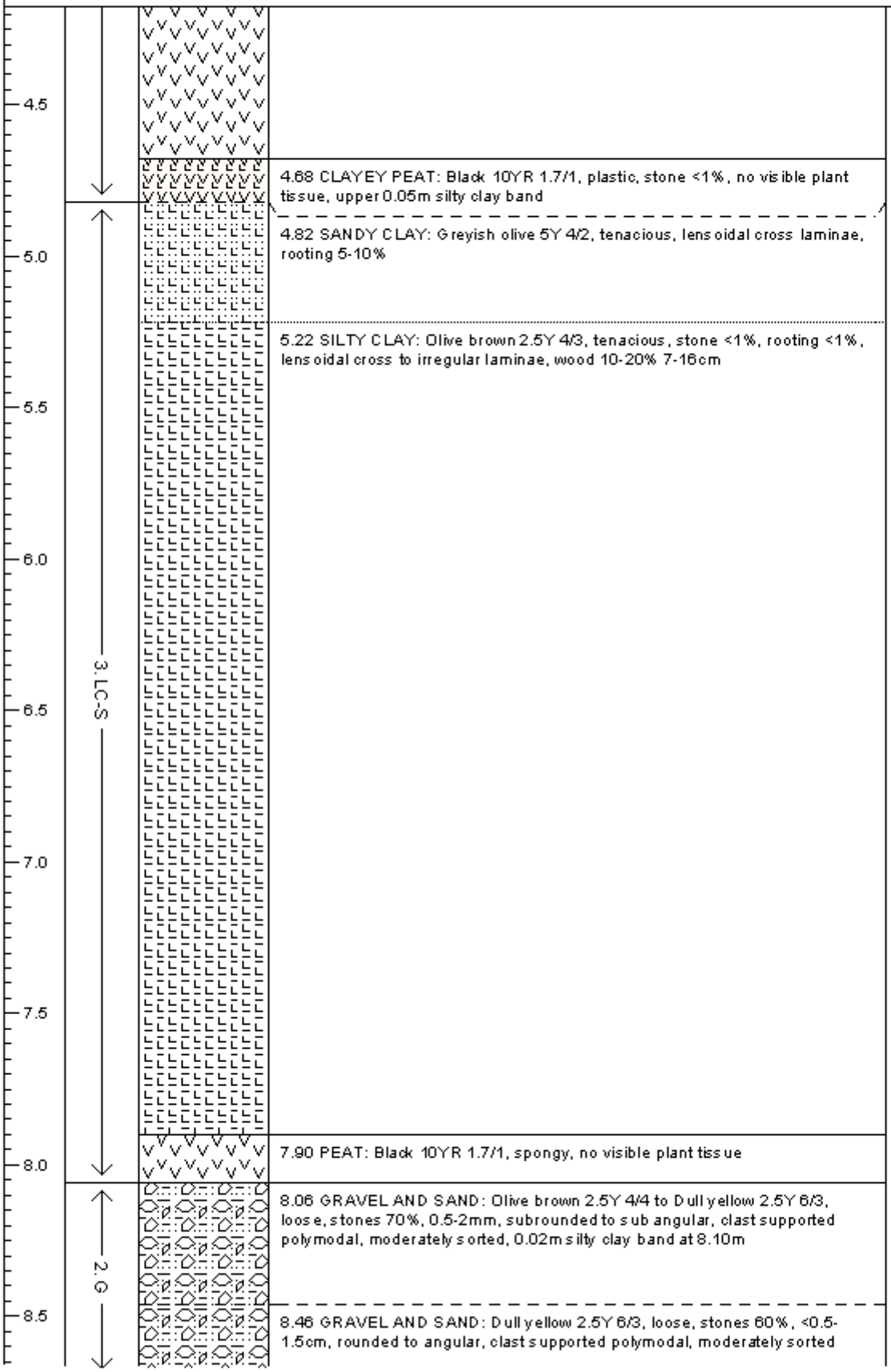
BOREHOLE No BH100	SITE NAME East Thamesmead Business Park	Oxford Archaeology
	SITE CODE ETB05	
	LOGGED BY VY DATE 8 March 2005	CLIENT Scott Wilson Kirkpatrick Ltd
GL (m AOD) 0.81	NGR E269.5137 N61.1603	

(m)	UNIT	LEGEND	DESCRIPTION	SAMPLES
0.0			0.00 TOPSOIL: Silty Clay, olive brown 2.5Y 4/4 tenaicious, stone 10%, subangular <4cm	
			0.14 MADE-GROUND: Sandy gravel, brown black 2.5Y 3/2, stone 30-40% <8cm, burnt stone 20%	
0.5	5. UC-S		0.30 SILTY CLAY: Black 2.5Y 2/1, mottled brown 40-60%, tenacious, stone <10% subrounded, rooting associated Fe mottling 5% (towards top), massive structure	
1.0				
1.5				
2.0				
			2.15 SILTY CLAY: Olive brown 2.5Y 4/3, tenacious, stone <1%, rooting associated Fe mottling 5%, 1cm thick peat lense (depth 2.21m), 20-30% brown mottling towards base, massive structure	
2.5				
			2.85 PEAT: Brownish black 7.5YR 2/2, spongy, 30-40% visible plant tissue, upper 0.1m clayey	
3.0				
			3.35 WOOD PEAT: Reddish black 2.5YR 1.7/1, spongy, 10-20% wood <8cm	
3.5	4. P/O		3.68 PEAT: Reddish black 2.5YR 1.7/1, spongy, 10-20% visible plant tissue, <5% wood	
4.0				

BOREHOLE No BH100
cont.

SITE NAME East Thamesmead Business Park

SITE CODE ETB05



4.68 CLAYEY PEAT: Black 10YR 1.7/1, plastic, stone <1%, no visible plant tissue, upper 0.05m silty clay band

4.82 SANDY CLAY: Greyish olive 5Y 4/2, tenacious, lensoidal cross laminae, rooting 5-10%

5.22 SILTY CLAY: Olive brown 2.5Y 4/3, tenacious, stone <1%, rooting <1%, lensoidal cross to irregular laminae, wood 10-20% 7-16cm

7.90 PEAT: Black 10YR 1.7/1, spongy, no visible plant tissue

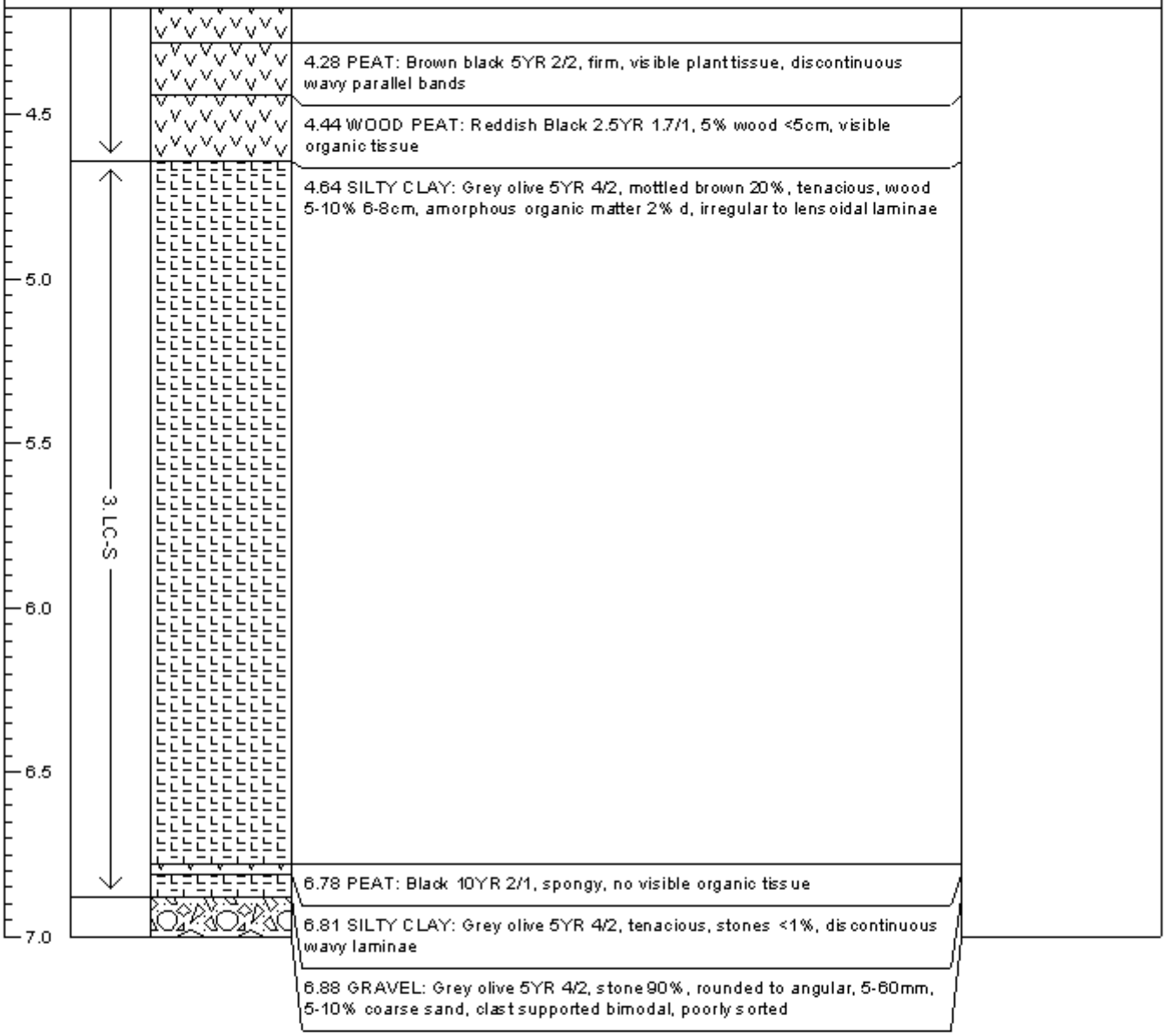
8.06 GRAVEL AND SAND: Olive brown 2.5Y 4/4 to Dull yellow 2.5Y 6/3, loose, stones 70%, 0.5-2mm, subrounded to sub angular, clast supported polymodal, moderately sorted, 0.02m silty clay band at 8.10m

8.46 GRAVEL AND SAND: Dull yellow 2.5Y 6/3, loose, stones 60%, <0.5-1.5cm, rounded to angular, clast supported polymodal, moderately sorted

BOREHOLE No BH101	SITE NAME East Thamesmead Business Park	Oxford Archaeology
	SITE CODE ETB05	
	LOGGED BY VY DATE 21 March 2005	CLIENT Scott Wilson Kirkpatrick Ltd
GL (m AOD) 0.26	NGR E183.3910 N141.5302	

(m)	UNIT	LEGEND	DESCRIPTION	SAMPLES
0.0			0.00 TOPSOIL: Clay, tenacious, brownish black 2.5Y 3/2, rooting associated Fe mottling 10%, stones <1%, discontinuous non-parallel bedding	
			0.11 SILTY CLAY: Dark olive brown 2.4Y 3/3, tenacious, stone 5-10%, subrounded, <2cm, 2% CBM 2cm, massive structure	
0.5			0.28 SILTY CLAY: Olive brown 2.5Y 4/4, mottled brown 40%, tenacious, rooting associated Fe mottling 10%, massive structure	
1.0	5. UC-S		0.92 SANDY SILT : Olive brown 2.5Y 4/3, mottled brown 60%, compact, Fe mottling 10-20%, stones <1%	
			1.13 SILTY CLAY: Olive brown 2.5Y 4/4, mottled brown 70%, tenacious, Fe mottling 10%, stones <1%, massive structure	
1.5			1.80 SILTY CLAY: Olive brown 2.5Y 4/3, tenacious, 5% amorphous organic remains, lensoidal laminae of light yellow s and silt 2-3cm	
2.0			1.95 WOOD PEAT: Black 7.5 YR 1.7/1, wood 5% 2-3cm, discontinuous parallel bedding, 0.05m band of Silty Clay, Brown Black 2.5Y 3/2, tenacious, stones <1%, massive structure at a depth of 2.15m	
2.5				
			2.84 PEAT: Brown Black 7.5Y 3/2, spongy, 10% visible plant tissue, discontinuous parallel bedding	
3.0	4. P/O		2.95 PEAT: Black 7.5 YR 1.7/1, spongy, <5% visible organic tissue	
			3.19 PEAT: Reddish black 2.5YR 1.7, firm, 10-20% visible organic tissue, discontinuous wavy to parallel bands	
3.5				
			3.80 PEAT: Black 7.5 YR 1.7/1, spongy to plastic, 2-5% visible plant tissue	
4.0				

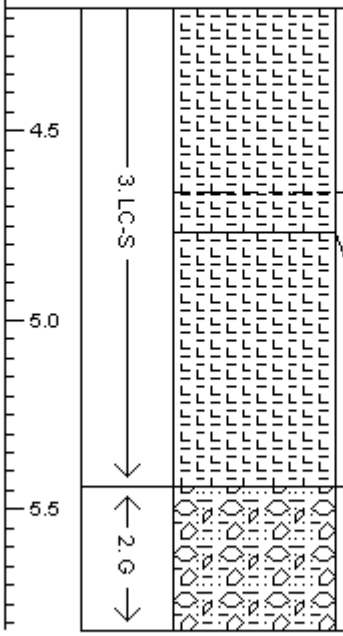
BOREHOLE No BH101 cont.	SITE NAME East Thamesmead Business Park
	SITE CODE ETB05



BOREHOLE No BH102	SITE NAME East Thamesmead Business Park	Oxford Archaeology
	SITE CODE ETB05	
	LOGGED BY VY DATE 22 March 2005	CLIENT Scott Wilson Kirkpatrick Ltd
GL (m AOD) 0.85	NGR E132.9090 N179.2175	

(m)	UNIT	LEGEND	DESCRIPTION	SAMPLES
0.0			0.00 MADE-GROUND: Yellow 2.5Y 8/6 to olive 5Y 5/4, compacted sand and sandy gravel on rubble base	
0.5				
	5. UC-S		0.63 SILTY CLAY: Olive black 5Y 3/2, tenacious, stones <1%, massive structure	
1.0			0.82 SILTY CLAY: Brown 10YR 4/4, mottled brown 70-80%, tenacious, stones <1%, Fe mottling 10-20%, massive structure	
1.5			1.40 SANDY CLAY: Olive Brown 2.5Y 4/4, mottled brown 40%, firm, Fe mottling 30%	
			1.56 SILTY CLAY: Dull yellowish brown 10YR 3/4, mottled brown 40%, tenacious, stones <1%, Fe mottling 20%, massive structure	
2.0			2.10 SANDY SILT : Olive brown 2.5Y 4/3, compact, 2% Fe mottling, dicontinuous wavy laminations	
	4. P/O		2.15 PEAT: Black 10YR 2/1, spongy to firm, 2% visible organic tissue, 0.03m Silty clay band at 2.21m, olive black 5Y 3/2, tenacious, stones <1%, 30% amorphous organic matter, dicontinuous wavy laminations	
2.5			2.78 PEAT: Brown black 5YR 2/1, spongy to firm, 20% visible organic tissue 5cm	
3.0			3.04 PEAT: Black 7.5YR 1.7/1, plastic, 5% visible organic tissue	
			3.26 PEAT: Brown black 7.5YR 2/2, spongy, 10-20% visible organic tissue	
			3.34 PEAT: Black 7.5YR 1.7/1, plastic to spongy, no visible organic tissue	
3.5			3.44 WOOD PEAT: Black 10YR 1.7/1, spongy, 10-20% visible organic tissue, wood 10-5% 0.08m Silty clay band at 3.66m, greyish olive 7.5Y 4/1, tenacious, stones <1%, 5% amorphous orgainc matter, massive structure	
4.0			4.00 SILTY CLAY: Olive black 5Y 3/1, tenacious, stones <1%, 5-10% amorphous organic matter, 2-5% rooting, lensoidal laminations of light yellow	

BOREHOLE No BH102 cont.	SITE NAME East Thamesmead Business Park
	SITE CODE ETB05



	sandy silt <3cm
	4.66 SILTY CLAY: Black 10YR 1.7/1, tenacious, wood 20%, amorphous organic matter 20%, discontinuous wavy laminations
	4.77 SILTY CLAY: Olive black 5YR 3/1, tenacious, wood 5% (banded), rooting 5%, amorphous organic matter 2%, massive structure
	5.44 GRAVEL AND SAND: Olive black 5YR 3/2, stones 70% 0.5-5cm rounded to sub angular, poorly sorted, clast supported ploymodal

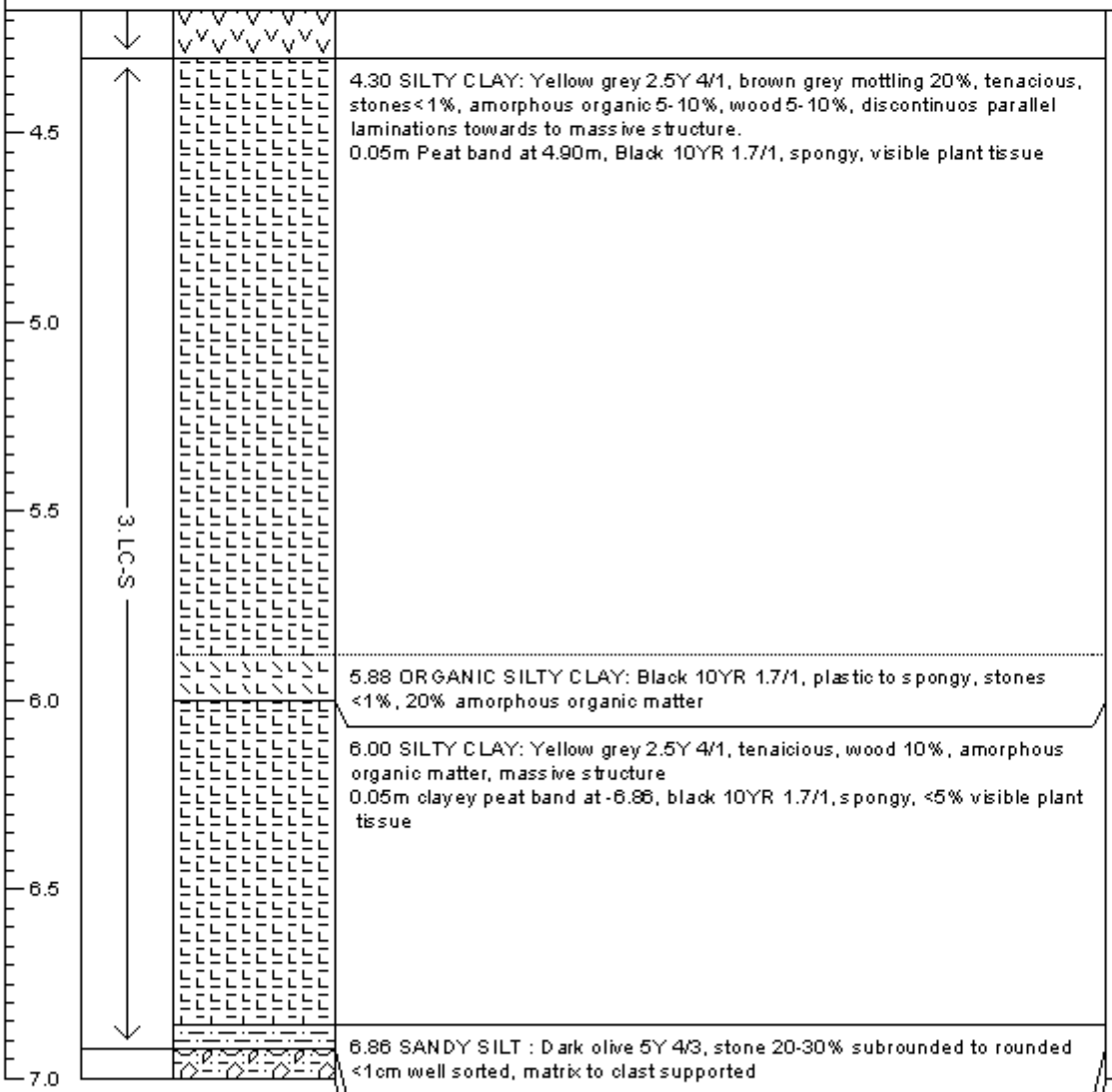
BOREHOLE No BH103	SITE NAME East Thamesmead Business Park	Oxford Archaeology
	SITE CODE ETB05	
	LOGGED BY VY DATE 22 March 2005	CLIENT Scott Wilson Kirkpatrick Ltd
GL (m AOD) 0.18	NGR E147.3189 N127.1280	

(m)	UNIT	LEGEND	DESCRIPTION	SAMPLES
0.0			0.00 TOPSOIL: Clay, brown black 2.5Y 3/2, tenacious, rooting 5-10%, Fe mottling 20-30%	
	5. UC-S		0.20 CLAY: Brown 10YR 4/4, tenacious, Fe mottling 10-20%, stones <1%, massive structure	
0.5			0.65 SANDY SILT : Dull yellow brown 10YR 4/3, firm, stones <1%, Fe mottling 5%	
1.0			1.02 CLAY: Grey yellow brown 10YR 5/2, mottled brown 40-60% decreasing to base, tenacious, stones <1%, rooting associated Fe mottling 5-10%, massive structure	
1.5				
2.0	4. P/O		1.97 PEAT: Black 10YR 1.7/1, spongy to plastic, no visible plant tissue	
			2.14 PEAT: Black 10YR 1.7/1, spongy to firm, 20-30% visible plant tissue, discontinuous wavy bedding	
2.5			2.66 WOOD PEAT: Black 10YR 1.7/1, spongy, visible plant tissue 10-20%, wood 5-10%, discontinuous wavy non parallel bedding, vertical clay filled cracks 5-10% 2-4cm	
3.0				
3.5			3.42 PEAT: Brownish black 10YR 2/2, firm, discontinuous parallel bedding, visible plant tissue 5%	
			3.54 WOOD PEAT: Black 10YR 1.7/1, spongy, wood 5%, discontinuos parallel bedding	
4.0			3.90 PEAT: Black 10YR 1.7/1, spongy, 5% visible plant tissue	

BOREHOLE No BH103	SITE NAME East Thamesmead Business Park	Oxford Archaeology
	SITE CODE ETB05	
	LOGGED BY VY DATE 22 March 2005	CLIENT Scott Wilson Kirkpatrick Ltd
GL (m AOD) 0.18	NGR E147.3189 N127.1280	

(m)	UNIT	LEGEND	DESCRIPTION	SAMPLES
0.0			0.00 TOPSOIL: Clay, brown black 2.5Y 3/2, tenacious, rooting 5-10%, Fe mottling 20-30%	
	5. UC-S		0.20 CLAY: Brown 10YR 4/4, tenacious, Fe mottling 10-20%, stones <1%, massive structure	
0.5			0.65 SANDY SILT : Dull yellow brown 10YR 4/3, firm, stones <1%, Fe mottling 5%	
1.0			1.02 CLAY: Grey yellow brown 10YR 5/2, mottled brown 40-60% decreasing to base, tenacious, stones <1%, rooting associated Fe mottling 5-10%, massive structure	
1.5				
2.0	4. P/O		1.97 PEAT: Black 10YR 1.7/1, spongy to plastic, no visible plant tissue	
			2.14 PEAT: Black 10YR 1.7/1, spongy to firm, 20-30% visible plant tissue, discontinuous wavy bedding	
2.5			2.66 WOOD PEAT: Black 10YR 1.7/1, spongy, visible plant tissue 10-20%, wood 5-10%, discontinuous wavy non parallel bedding, vertical clay filled cracks 5-10% 2-4cm	
3.0				
3.5			3.42 PEAT: Brownish black 10YR 2/2, firm, discontinuous parallel bedding, visible plant tissue 5%	
			3.54 WOOD PEAT: Black 10YR 1.7/1, spongy, wood 5%, discontinuos parallel bedding	
4.0			3.90 PEAT: Black 10YR 1.7/1, spongy, 5% visible plant tissue	

BOREHOLE No BH103 cont.	SITE NAME East Thamesmead Business Park
	SITE CODE ETB05



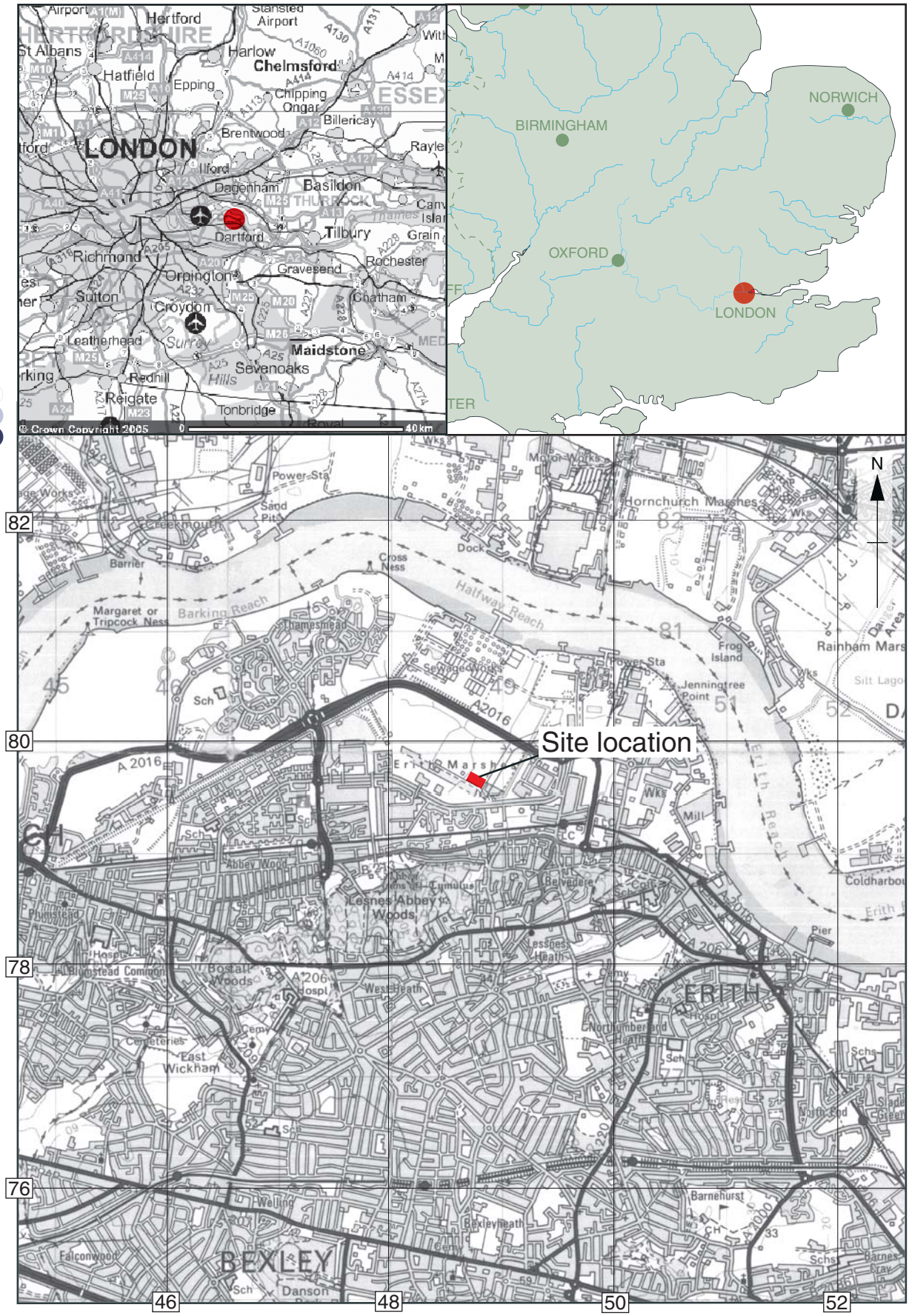
4.30 SILTY CLAY: Yellow grey 2.5Y 4/1, brown grey mottling 20%, tenacious, stones<1%, amorphous organic 5-10%, wood 5-10%, discontinuos parallel laminations towards to massive structure.
0.05m Peat band at 4.90m, Black 10YR 1.7/1, spongy, visible plant tissue

5.88 ORGANIC SILTY CLAY: Black 10YR 1.7/1, plastic to spongy, stones <1%, 20% amorphous organic matter

6.00 SILTY CLAY: Yellow grey 2.5Y 4/1, tenaicious, wood 10%, amorphous organic matter, massive structure
0.05m clayey peat band at -6.86, black 10YR 1.7/1, spongy, <5% visible plant tissue

6.86 SANDY SILT : Dark olive 5Y 4/3, stone 20-30% subrounded to rounded <1cm well sorted, matrix to clast supported

6.92 GRAVEL AND SAND: Yellow grey 2.5Y 4/1, stones 60% <1.5-4cm rounded to angular, moderately sorted, clast supported polymodal



Scale 1:50,000

Figure 1: Site location

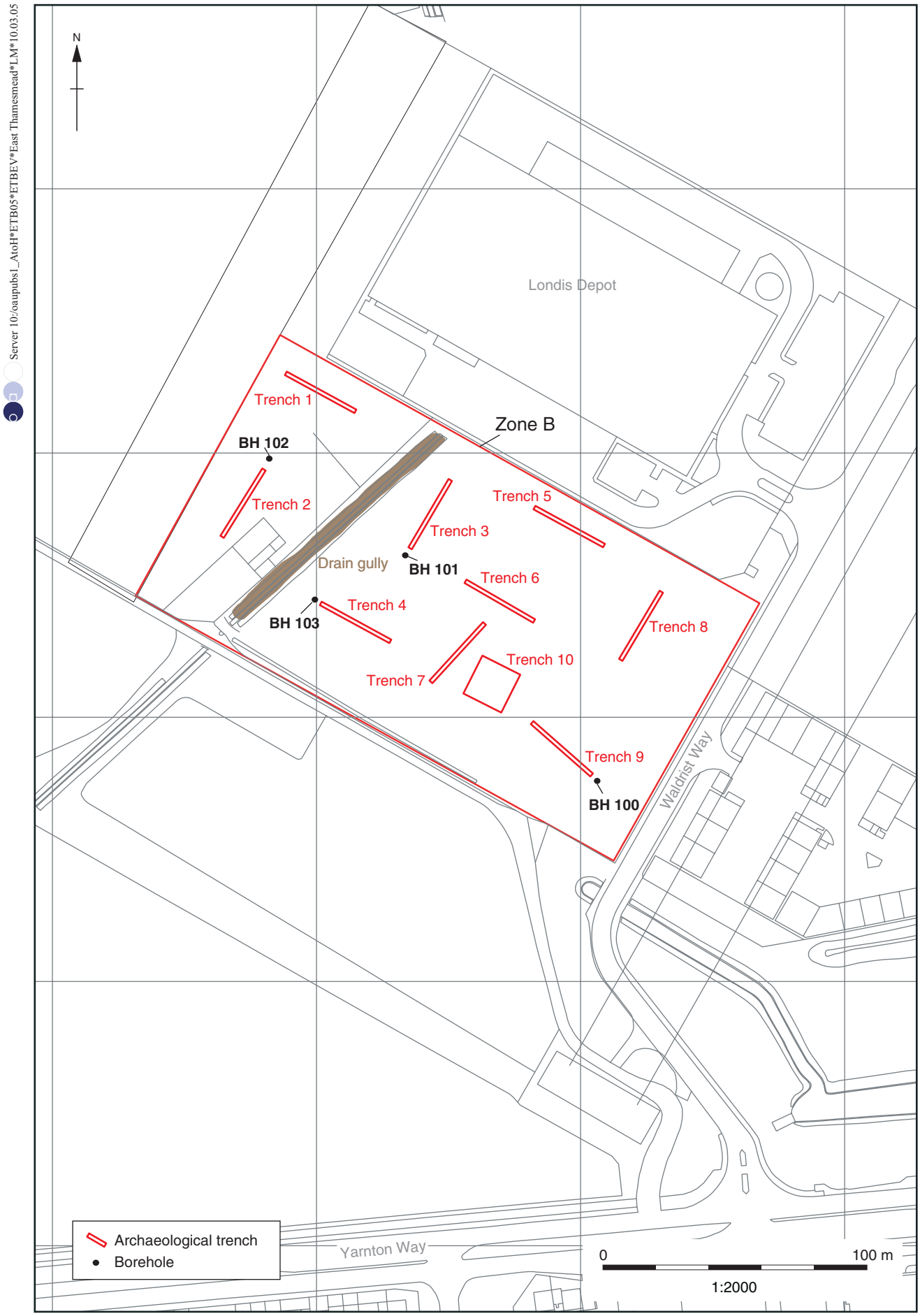
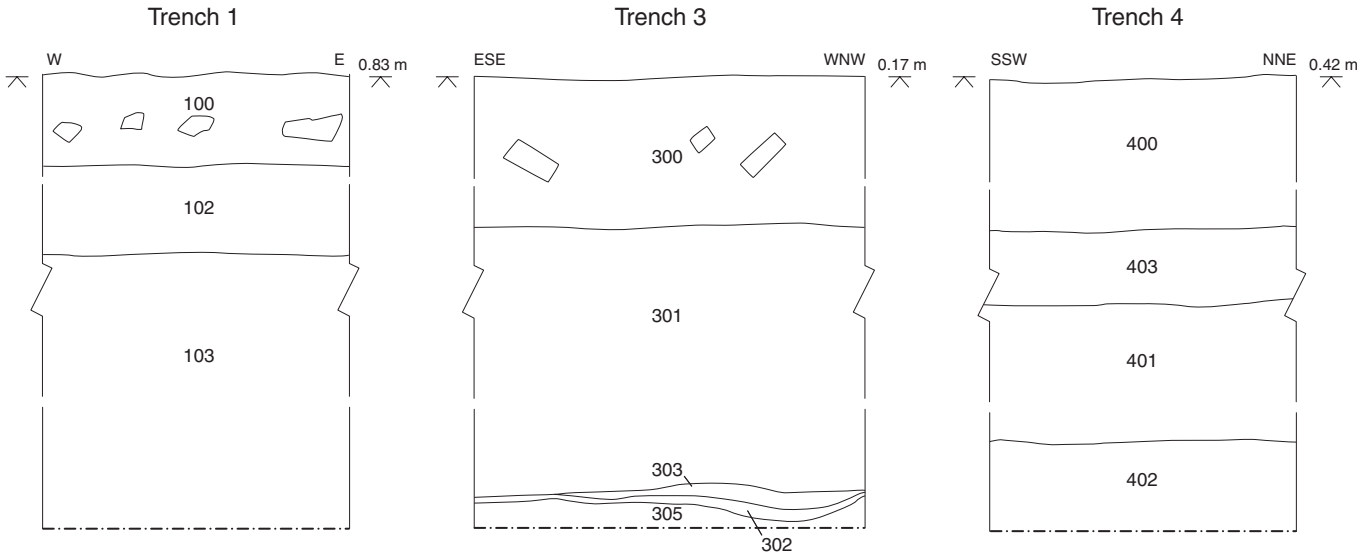


Figure 2: Trench locations



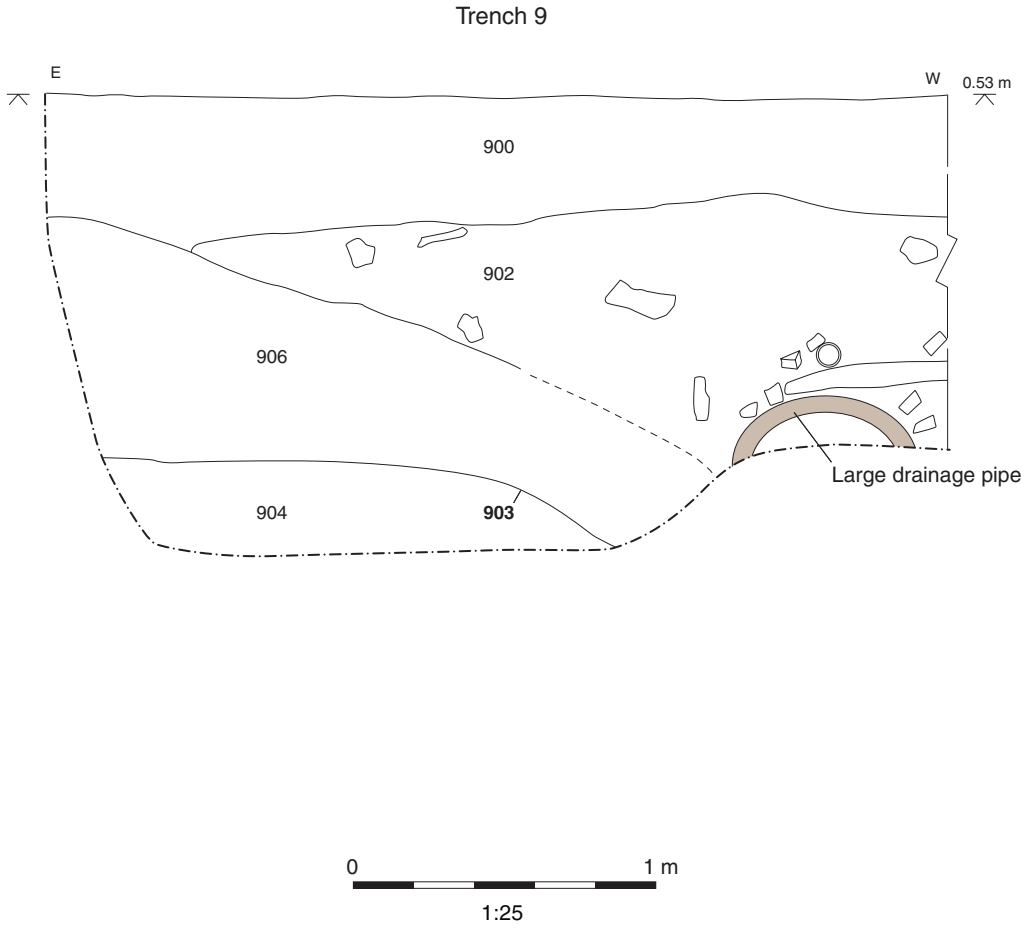


Figure 3: Sections from Trenches 1, 3, 4 and 9

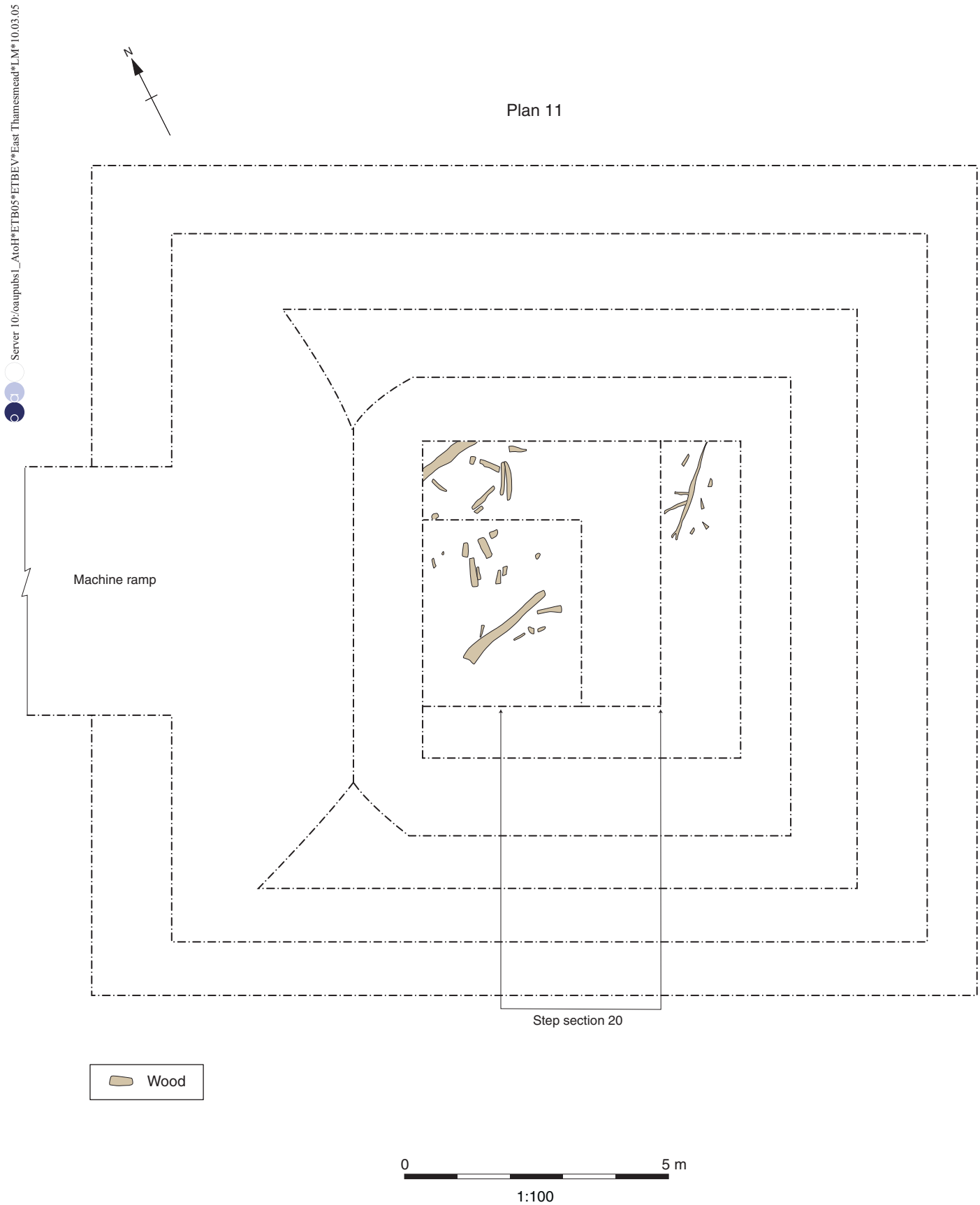


Figure 4: Plan of Trench 10

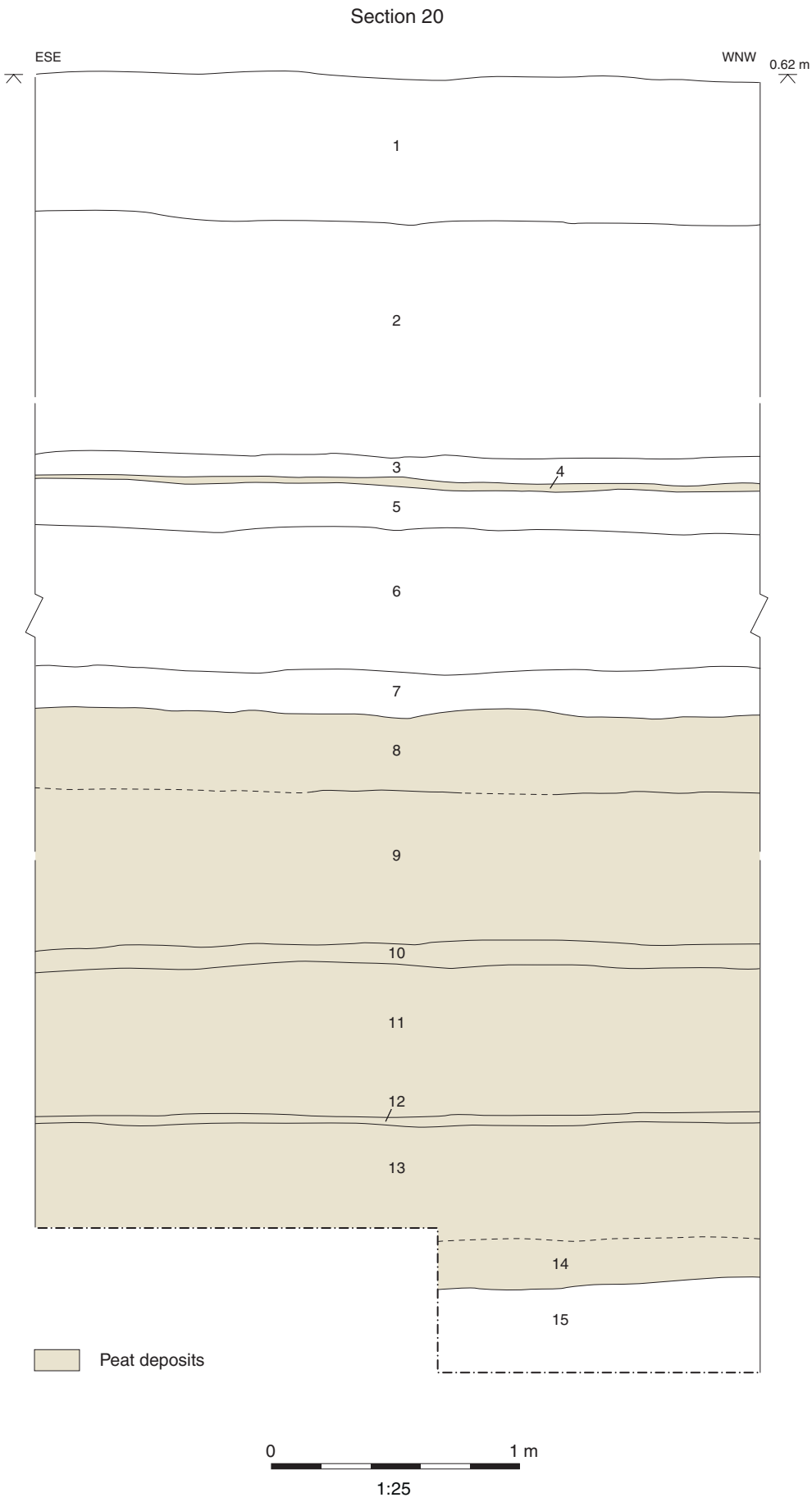


Figure 5: Trench 10 main section