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Lots Road Power Station And Chelsea Creek

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SPECIFICATION FOR A GEOARCHAEOLOGICAL EVALUATION

LOTS ROAD POWER STATION AND LAND AT THAMES AVENUE LONDON SW10

RICHARD MEAGER BA MA AIFA

MAY 2007

SPECIFICATION FOR A GEOARCHAEOLOGICAL EVALUATION

LOTS ROAD POWER STATION AND LAND AT THAMES AVENUE LONDON SW10

LOCAL PLANNING AUTHORITIES:
LONDON BOROUGH OF HAMMERSMITH & FULHAM and ROYAL LONDON BOROUGH OF KENSINGTON & CHELSEA

SITE CENTRED AT:
TQ264 769

RICHARD MEAGER BA MA AIFA

MAY 2007

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1.0 INTRODUCTION

1.1 It is proposed to redevelop the site of Lots Road Power Station, and land at Thames Avenue, London SW10 (also referred to as the study site) for a residential-led mixed use scheme (Figs 1-5). Planning permission for the redevelopment of the site was granted in January 2006.

1.2 The study site is bisected by Chelsea Creek. South of the Creek the development site lies in the London Borough of Hammersmith and Fulham, while to the north the Powers Station site lies in the Royal Borough of Kensington and Chelsea (Section 2).

1.3 Previous work on the southern part of the study site has identified an in-situ stratigraphic sequence comprising alluvium and other sediments ranging from the Lateglacial and Holocene Ages, dating to the Late Palaeolithic, Mesolithic to Late Bronze Age, and Iron Age and historic periods. Furthermore, this previous work did not reveal any evidence for human activity (MoLAS 2002).

1.4 The impact of past development across the bulk of the study site can be shown to have been severe, due to the impact of nineteenth and twentieth century development, and the construction of Lots Road Power Station across the northern part of the site, built 1902-4.

1.5 Potentially significant archaeological deposits on the site are sealed by a substantial depth of Victorian and modern made ground (up to a maximum depth of 4-5m: MoLAS 2002) and are therefore not accessible to conventional archaeological investigation.

1.6 The river channel which bisects the site, and any relict channels which occur within the remainder of the study site, afford an extremely unusual opportunity to examine evidence for at least 10,000 years of past environment change in this part of south west London, an area in which generally the survival of palaeoenvironmental evidence is poor.

1.7 Because of the depth of the deposits below existing ground level it is proposed to execute up to seven geoarchaeological boreholes, rather than attempting to access the potentially significant deposits through conventional test pits or trial trenches.

2.0 PLANNING BACKGROUND AND DEVELOPMENT PLAN FRAMEWORK

2.1 In November 1990 the Department of the Environment issued Planning Policy Guidance Note 16 (PPG16) "Archaeology and Planning", providing guidance for planning authorities, property owners, developers and others on the preservation and investigation of archaeological remains.

2.2 In short, government guidance provides a framework which:

- Protects Scheduled Ancient Monuments
- Protects the settings of these sites
- Protects nationally important un-scheduled ancient monuments
- In appropriate circumstances seeks adequate information, in this instance through field evaluation, to enable informed decisions
- Provides for the excavation and investigation of sites not important enough to merit in-situ preservation.

2.3 In considering any planning application for development, the local planning authority is bound by the policy framework set by government guidance, in this instance PPG16, by current Development Plan Policy and by other material considerations.

2.4 The relevant Strategic Development Plan framework is provided by the London Plan, published on 10 February 2004. It includes the following policy relating to archaeology within central London:

POLICY 4B.14 ARCHAEOLOGY

THE MAYOR, IN PARTNERSHIP WITH ENGLISH HERITAGE, THE MUSEUM OF LONDON AND BOROUGHS, WILL SUPPORT THE IDENTIFICATION, PROTECTION, INTERPRETATION AND PRESENTATION OF LONDON'S ARCHAEOLOGICAL RESOURCES. BOROUGHS IN CONSULTATION WITH ENGLISH HERITAGE AND OTHER RELEVANT STATUTORY ORGANISATIONS SHOULD INCLUDE APPROPRIATE POLICIES IN THEIR UDPS FOR PROTECTING SCHEDULED ANCIENT MONUMENTS AND ARCHAEOLOGICAL ASSETS WITHIN THEIR AREA.

2.5 The study site is bisected by Chelsea Creek. South of the Creek the development site lies in the London Borough of Hammersmith and Fulham, while north of the Creek the Powers Station site lies in the Royal Borough of Kensington and Chelsea.

2.6 The relevant Development Plan framework for the southern part of the study site is therefore provided by the Hammersmith & Fulham Unitary Development Plan, adopted August 2003. The Plan contains the following policy which provides a framework for the consideration of development proposals affecting archaeological features:

POLICY EN6:
BUILDINGS AND ARTEFACTS OF LOCAL IMPORTANCE AND INTEREST

DEVELOPMENT WILL NOT BE PERMITTED IF IT WOULD RESULT IN THE DEMOLITION, LOSS OR HARMFUL ALTERATION TO BUILDINGS, STRUCTURES AND ARTEFACTS THAT ARE OF LOCAL TOWNSCAPE, ARCHITECTURAL OR HISTORIC INTEREST, INCLUDING ALL BUILDINGS IDENTIFIED ON THE COUNCIL'S REGISTER OF BUILDINGS OF MERIT (GLOSSARY) CONTAINED WITHIN SUPPLEMENTARY PLANNING GUIDANCE UNLESS:

1. **(A) THE BUILDING OR STRUCTURE IS NO LONGER CAPABLE OF BENEFICIAL USE, AND ITS FABRIC IS BEYOND REPAIR; OR**

(B) THE PROPOSED REPLACEMENT WOULD BRING SUBSTANTIAL BENEFITS TO THE COMMUNITY AND WHICH WOULD DECISIVELY OUTWEIGH THE LOSS; AND

(C) THE PROPOSED DEVELOPMENT CANNOT PRACTICABLY BE ADAPTED TO RETAIN ANY HISTORIC INTEREST THAT THE BUILDING OR STRUCTURE POSSESSES; AND

(D) THE EXISTING BUILDING OR STRUCTURE HAS BEEN FULLY RECORDED; AND

2. **IN THE CASE OF ARTEFACTS, THEY CANNOT PRACTICABLY BE RETAINED IN SITU OR, FAILING THAT, RETAINED FOR RE-USE ELSEWHERE WITHIN THE SITE.**

POLICY EN7: NATIONALLY AND LOCALLY IMPORTANT ARCHAEOLOGICAL REMAINS

1. **THERE WILL BE A PRESUMPTION AGAINST PROPOSALS WHICH WOULD INVOLVE SIGNIFICANT ALTERATION OF, OR CAUSE DAMAGE TO, ARCHAEOLOGICAL REMAINS OF NATIONAL IMPORTANCE, WHETHER SCHEDULED OR NOT. THERE WILL ALSO BE A PRESUMPTION AGAINST PROPOSALS WHICH HAVE A SIGNIFICANT AND HARMFUL IMPACT ON THE SETTING OF VISIBLE ARCHAEOLOGICAL REMAINS OF NATIONAL IMPORTANCE WHETHER SCHEDULED OR NOT.**

2. **DEVELOPMENT AFFECTING SITES OF ARCHAEOLOGICAL REMAINS OF LOCAL INTEREST AND THEIR SETTINGS WILL ONLY BE PERMITTED IF THE NEED FOR THE DEVELOPMENT OUTWEIGHS THE LOCAL VALUE OF THE REMAINS.**

3. **APPLICANTS WILL BE REQUIRED TO ARRANGE FOR ARCHAEOLOGICAL FIELD EVALUATION OF ANY SUCH REMAINS WITHIN THE ARCHAEOLOGICAL PRIORITY AREAS (GLOSSARY) DEFINED ON THE PROPOSALS MAP BEFORE APPLICATIONS ARE DETERMINED OR IF FOUND DURING DEVELOPMENT WORKS IN SUCH AREAS OR ELSEWHERE. PROPOSALS SHOULD INCLUDE PROVISION FOR THE REMAINS AND THEIR SETTINGS TO BE PROTECTED, ENHANCED OR PRESERVED. WHERE IT IS ACCEPTED THAT PHYSICAL PRESERVATION IN SITU IS NOT MERITED, PLANNING PERMISSION MAY BE SUBJECT TO CONDITIONS AND/OR FORMAL AGREEMENT REQUIRING THE DEVELOPER TO SECURE INVESTIGATION AND RECORDING OF THE REMAINS, AND PUBLICATION OF THE RESULTS.**

2.7 The relevant Development Plan framework for the northern part of the study site is provided by the Kensington and Chelsea Unitary Development Plan, adopted May 2002. The Plan contains the following policy which provides a framework for the consideration of development proposals affecting archaeological features:

CD85
TO ENCOURAGE THE CONSERVATION, PROTECTION AND ENHANCEMENT OF SITES OF ARCHAEOLOGICAL INTEREST ANDTHEIR SETTINGS AND THEIR INTERPRETATION AND PRESENTATION TO THE PUBLIC.

CD86
TO REQUIRE, WHERE DEVELOPMENT IS PROPOSED ON SITES OF ARCHAEOLOGICAL SIGNIFICANCE OR POTENTIAL THAT:

a) DESK BASED ASSESSMENT AND WHERE NECESSARY ARCHAEOLOGICAL FIELD EVALUATION TAKES PLACE BEFORE DEVELOPMENT PROPOSALS ARE DETERMINED;
b) REMAINS AND THEIR SETTINGS ARE PERMANENTLY PRESERVED EITHER IN SITU, OR EXCEPTIONALLY BY RECORD; AND
c) PROVISION IS MADE FOR AN APPROPRIATE LEVEL OF ARCHAEOLOGICAL EXCAVATION AND RECORDING TO TAKE PLACE PRIOR TO DEVELOPMENT COMMENCING ON SITE.

CD87
TO ENCOURAGE CO-OPERATION BETWEEN LANDOWNERS, DEVELOPERS AND ARCHAEOLOGICAL ORGANISATIONS, IN ACCORDANCE WITH THE PRINCIPLES OF THE BRITISH ARCHAEOLOGISTS' LIAISON GROUP CODE OF PRACTICE.

2.8 The southern part of the study site, within the London Borough of Hammersmith & Fulham, does not lie within a designated Archaeological Priority Area. The northern part of the study site, within the Royal London Borough of Kensington & Chelsea, lies within an Archaeological Priority Area.

2.9 The planning permission granted in January 2006 for both parts of the study site included the following condition (as Condition No 18 for Hammersmith & Fulham, and Condition 25 for Kensington & Chelsea).

No development shall take place until the applicant, or its agents or successors in title, has secured the implementation of a programme of archaeological work in accordance with a written scheme of investigation which has been submitted to and approved in writing by the local planning authority

2.10 This document therefore comprises the Written Scheme of Investigation for the proposed archaeological work at Lots Road.

2.11 The proposed geoarchaeological survey therefore seeks to address UDP Policies EN6 and 7 for the southern part of the study site, and UDP Policies CD85-7 for the northern part of the study site, and London Plan Policy 4B14 for the whole of the study site.

3.0 SCOPE OF INVESTIGATIONS

3.1 The purpose of this investigation is to provide a full archive of the sub surface *in situ* deposits within the study site.

3.2 The proposed geoarchaeological evaluation has a number of key objectives:

I. To provide an archive of stratigraphic data/material.

II. To provide a chronological and stratigraphical framework in which both the archaeological and palaeoenvironmental data/information may be articulated in order to assess its importance and rarity etc.

III. To provide an environmental history of the relict river channel (and thereby the surrounding area) during the course of its silting and subsequent infilling.

IV. The stratigraphic sequence and the information it contains should be examined to determine if there are specific horizons at which human activity can be identified. The extent to which this activity has produced recognisable changes to the local environment should be assessed and the implications for cultural activity in the vicinity considered.

4.0 METHODOLOGY

4.1 It is proposed to drill seven boreholes within the site positioned to sample palaeoenvironmental remains likely to be affected by the proposed development (Fig 6).

4.2 The fieldwork should include:

i. Use of a cable percussion drilling rig to drill seven holes in the locations indicated on Fig. 6, down to the level of the floodplain gravel or, if absent, the London Clay. All boreholes need to be located in three dimensions tied into the National Grid.

ii. Recovery of U4/U100 undisturbed core samples from all in situ sediments. Recording OD levels.

4.3 The Assessment should include:

i. Assessment of samples to produce X-radiography, sample descriptions and lithostratigraphic description and preliminary interpretation of site formation process and depositional environment.

ii. Preliminary Pollen/diatom assessment of selected samples.

iii. At least two sample C14 determinations to provide a chronological framework.

iv. Preliminary assessment of plant macrofossils and insects at selected points in the organic sequence.

v. Identify deposits that may be of potential anthroprogenic origin, e.g. charcoal horizons or stratigraphic features, which may indicate human activity or a hiatus in sedimentation.

vi. A contingency for additional C14 dates.

vii. Comparison of on-site stratigraphic architecture with the sequence in previous investigations (archaeological and engineering).

viii. Production of integrated illustrated archive report with plain English summary and GLSMR form.

4.4 Points for consideration contingent on investigation results.

Early consideration should be given to the possibility of requiring the following after the initial assessment.

i. A detailed pollen and diatom analysis of samples.

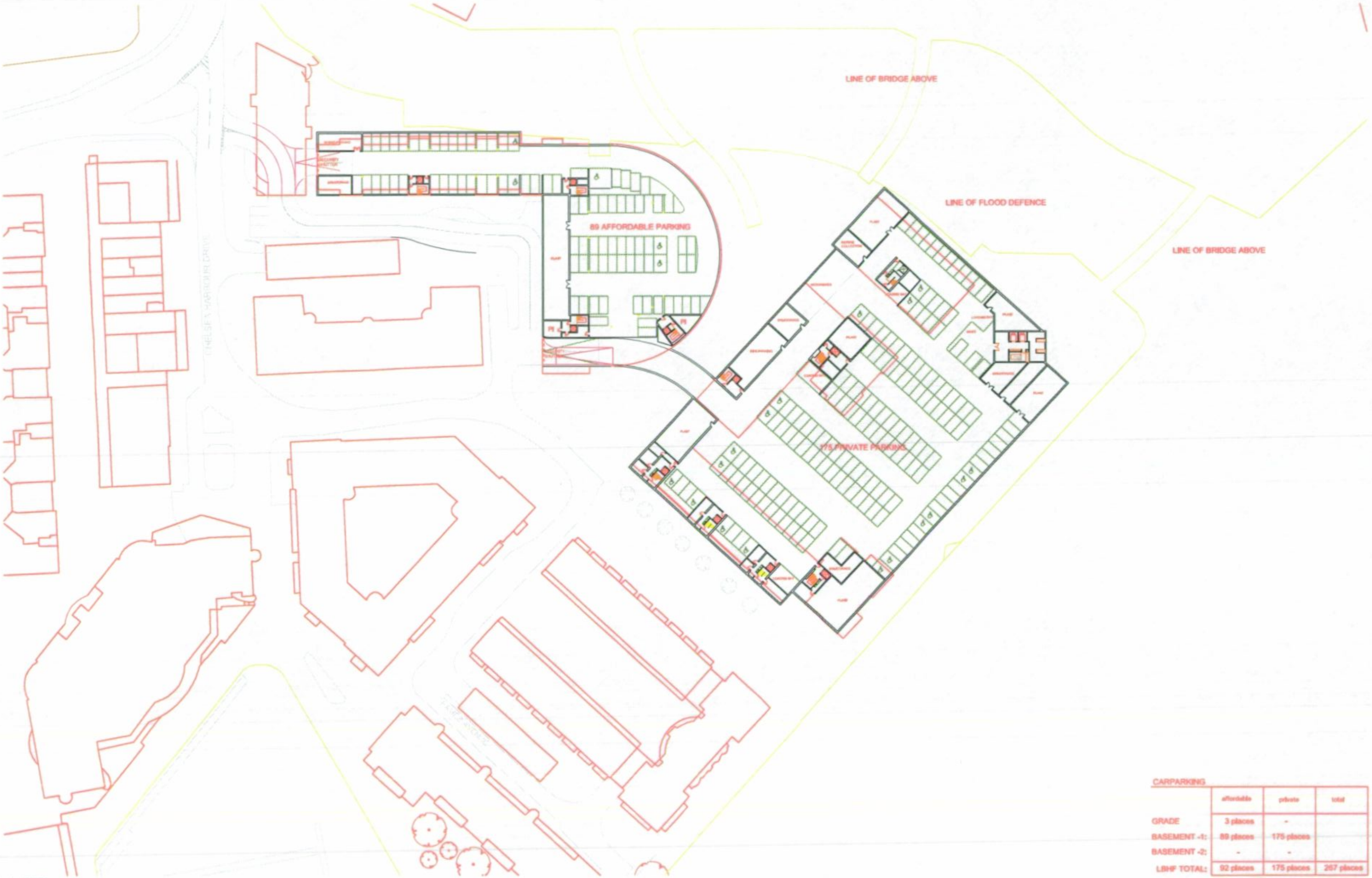
ii. A detailed sedimentological analysis of the samples to include loss on ignition, magnetic susceptibility and particle size measurements.

iii. A full plant macro fossil analysis of the samples selected for pollen analysis.

4.5 Should the results of the investigation justify it, a full published report will be prepared for publication in an appropriate journal.

Figure 1: Site Details

Figure 2: Site plan as existing

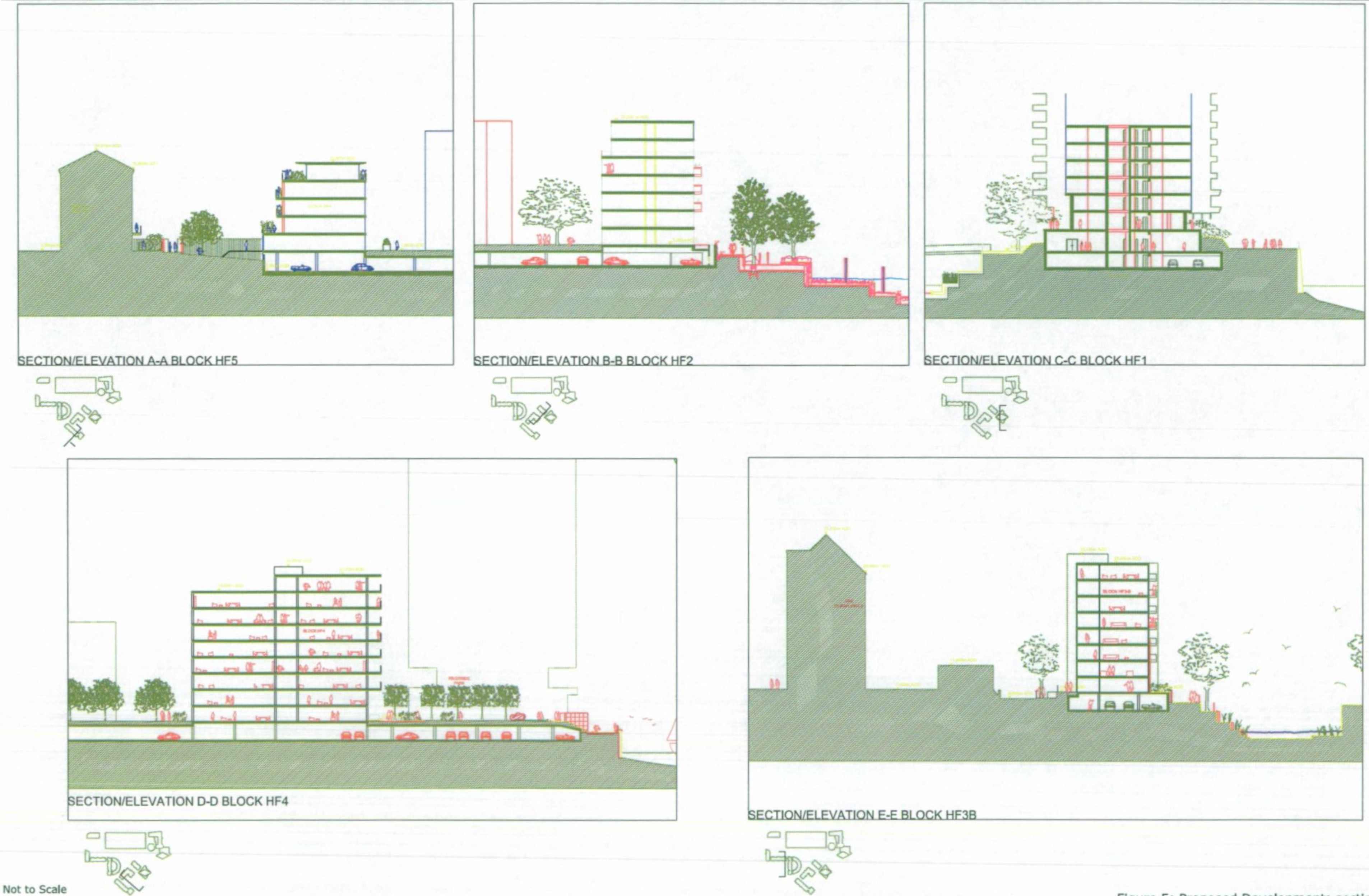


Scale 1:1000

Figure 3: Proposed Development: Basement Plan

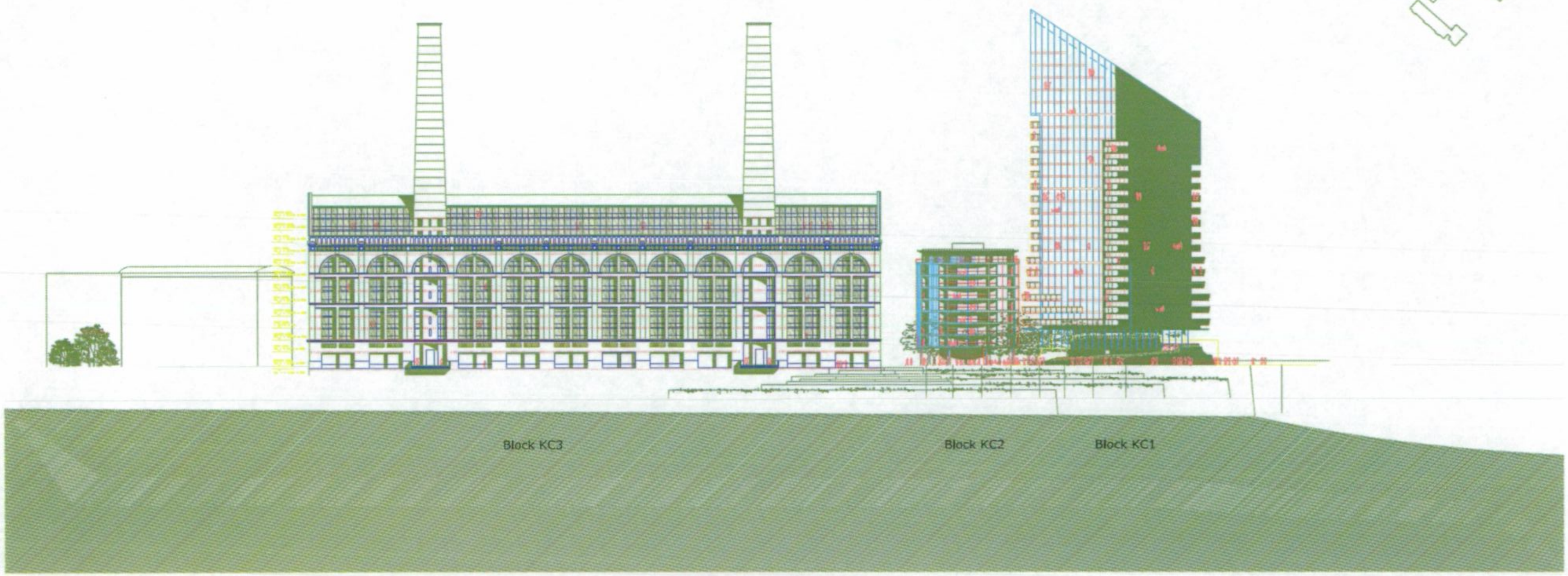
Scale 1:2500

Figure 4: Proposed Development: Ground Floor Plans



Not to Scale

Figure 5: Proposed Development: sections



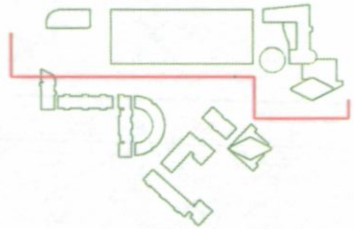


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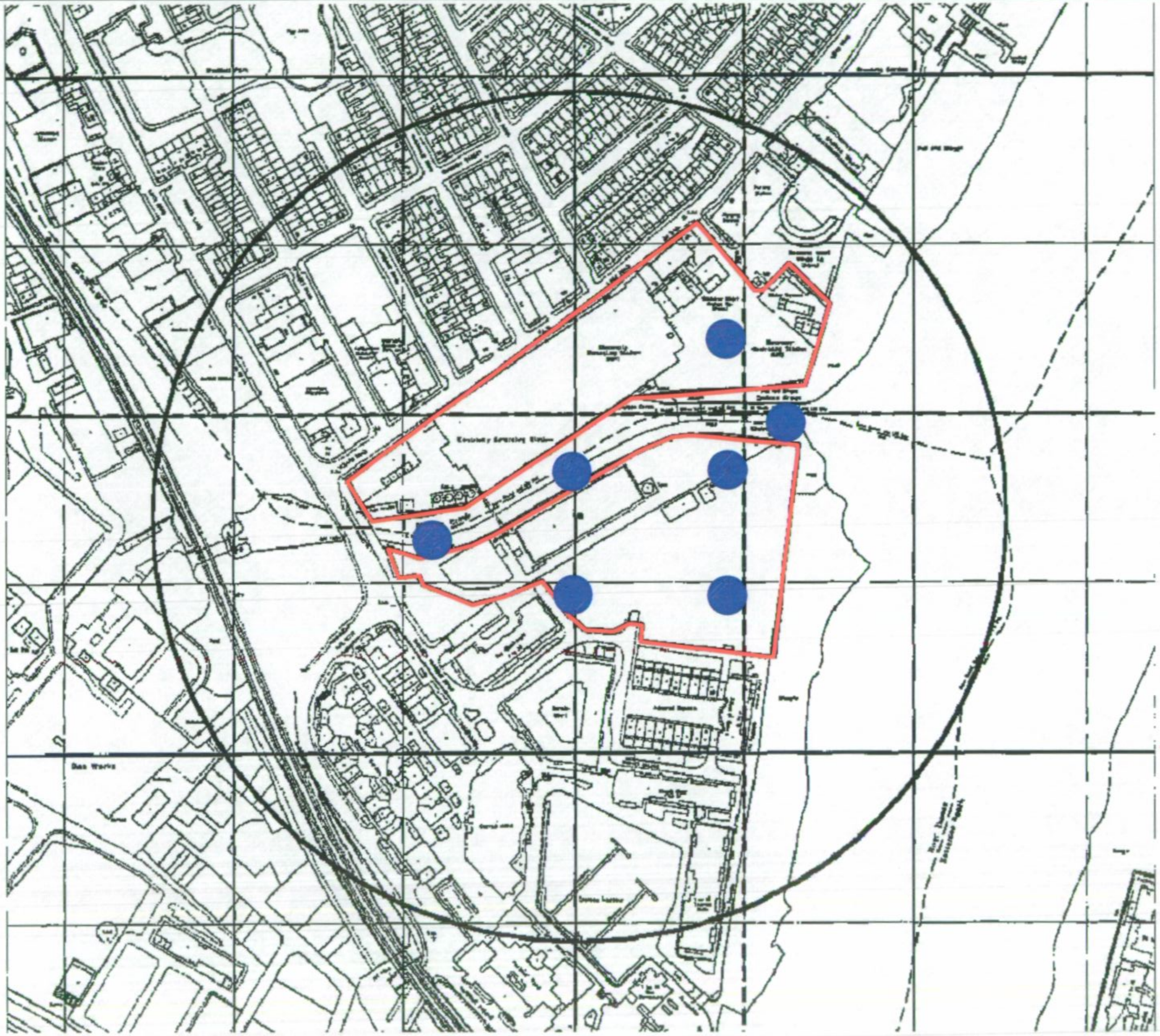
Figure 6: Proposed Development: sections



Legend

Proposed Borehole Locations

Site Boundary

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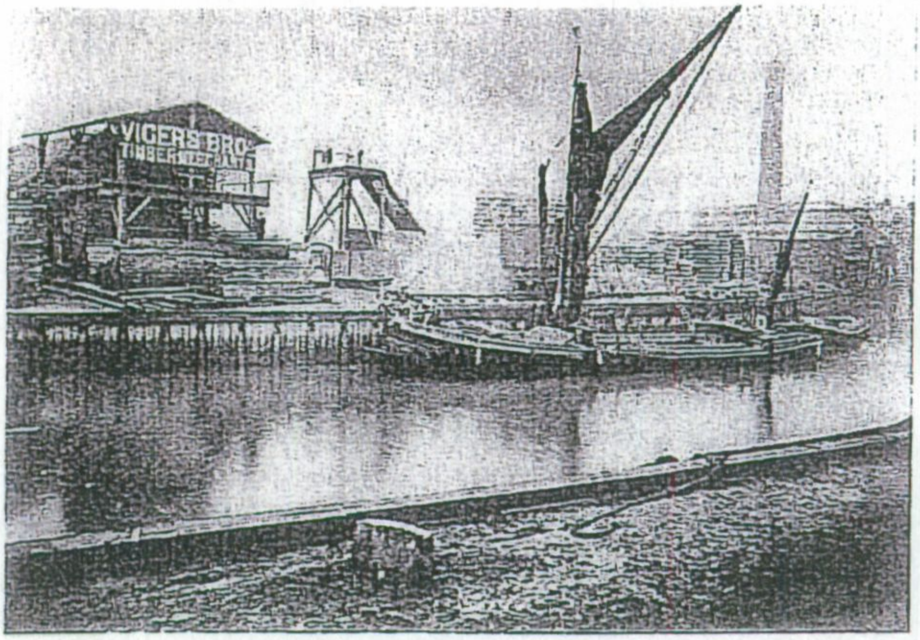
Figure 7: Proposed Borehole Location Plan

APPENDIX 1

Museum of London Archaeology Service
Lots Road Power Station Development Site B, and Land t Thames Avenue London SW10.
Geoarchaeological Monitoring of Geotechnical Boreholes, Site B. 2002



LOTS ROAD POWER STATION DEVELOPMENT
SITE B,
and
LAND AT THAMES AVENUE
London
SW10

London Borough of Hammersmith and Fulham

A report on the geoarchaeological monitoring of geotechnical boreholes

September 2002

MUSEUM OF LONDON
Archaeology Service

LOTS ROAD POWER STATION DEVELOPMENT
SITE B,
and
LAND AT THAMES AVENUE
London SW10

London Borough of Hammersmith and Fulham

A report on the geoarchaeological monitoring of geotechnical boreholes

Site Code: LRP02
National Grid Reference: 526395 176968

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Summary (Non-Technical)

This report presents the results of a monitoring exercise carried out by the Museum of London Archaeology Service on geotechnical boreholes at the site of Lots Road Power Station (Site B and Land at Thames Avenue) in the Royal Borough of Hammersmith and Fulham, London. The boreholes were monitored between the 27th of February and 19th of March 2002. The report was commissioned from MoLAS by Waterman Environmental on behalf of their client Circadian Ltd.

The results of the borehole evaluation have helped to refine the initial assessment of the archaeological potential of the site. Alluvial deposits of archaeological and past environmental potential are likely to survive on the site below about 3m OD, buried by around 4m of Victorian and modern dumps, levelling and redeposited alluvium. However, parts of the site appear to have been more directly influenced by river activity in the prehistoric and historic periods. In these areas no organic deposits exist and the archaeological and past environmental potential is expected to be low.

Radiocarbon dating of samples taken from the boreholes has shown that the site became progressively waterlogged as the river level rose during the prehistoric period. Until the early Iron Age a dry land-surface existed across most of the site with only the extreme eastern area likely to have been a marshy wetland environment. Thus in the west and central parts of the site, where the sand and gravel surface lies above ¯0.5m OD, there is potential for recovering evidence of prehistoric (Mesolithic to at least early Iron Age) dryland activity. In the extreme eastern part of the site, where the gravel surface lies below –1m OD, a dry landsurface probably existed in the Mesolithic and Neolithic periods, becoming a wetland area in the Bronze Age. The dry landsurface, however, would not have been conducive to the preservation of organic remains and has poor potential for the recovery of environmental evidence.

For the pre-Iron Age period environmental evidence will be better-preserved along the eastern margins of the site. In this area organic deposits dating to the Bronze Age may preserve archaeological remains such as trackways and also plant remains, insects, snails, pollen and diatoms, with which the Bronze Age environment can be reconstructed. During the Iron Age peat began to develop above the former dryland soil at increasingly higher elevations and by the Romano-British period the entire site had become directly influenced by the river, most probably in the form of seasonal over-bank flooding. Although such an environment is likely to produce few archaeological remains, good ecological evidence for the Iron Age, Roman and possibly the subsequent historic period is likely to survive in the peat and overlying inter-bedded peat and clay. As the Bronze Age environment of the Thames Valley in Greater London is comparatively well known, the potential of environmental evidence from the site to contribute to our understanding of the Iron Age and Roman landscape, for which much less information is currently available, is of greater significance.

The deposits of archaeological and environmental significance are likely to be disturbed by piling and pile probing works and by the excavation of any basements and services extending deeper than 3m OD and in particular below 0m OD.

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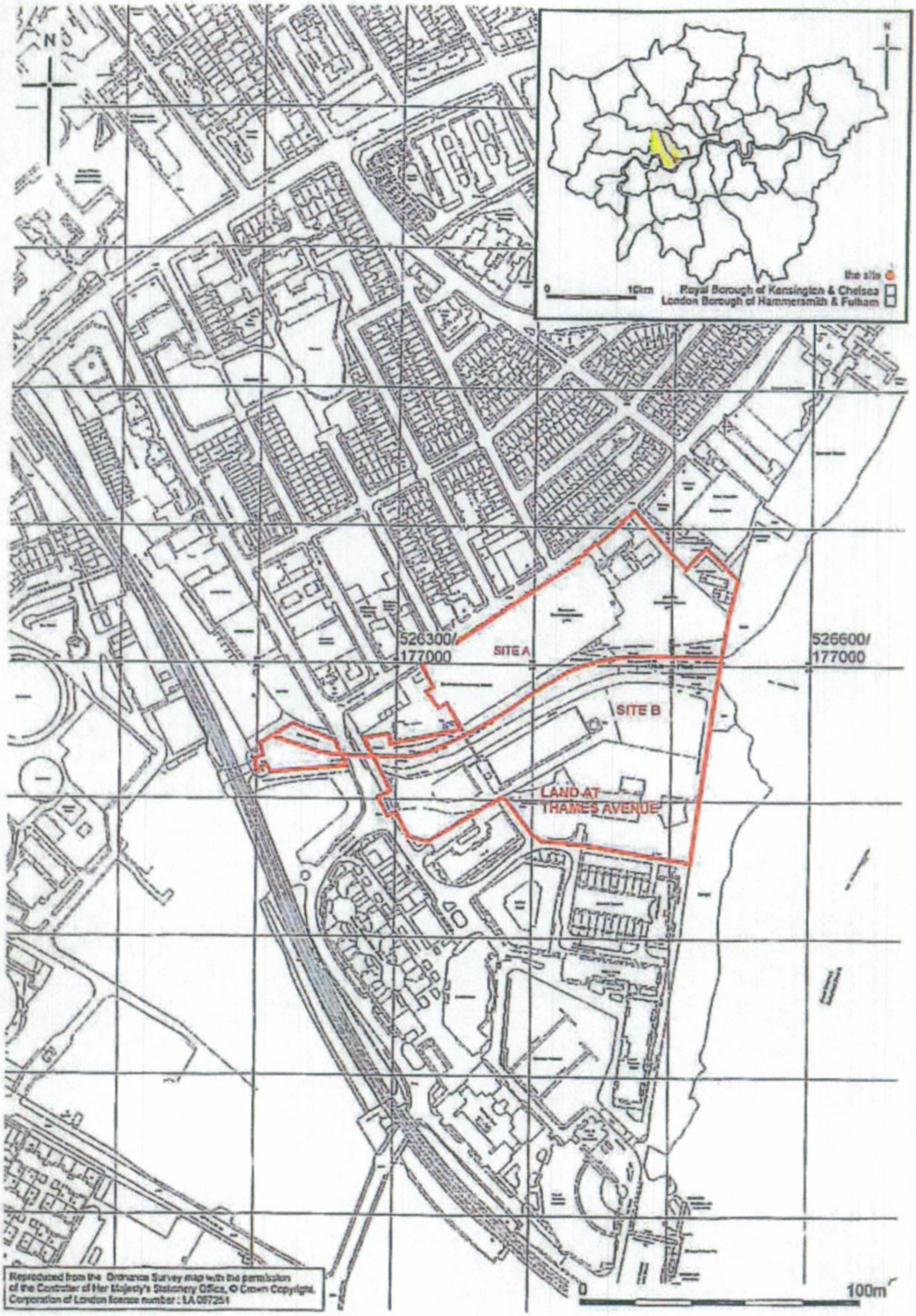

Fig 1 Site location

Introduction

Site background

The monitoring took place at Lots Road Power Station in the Royal Borough of Hammersmith and Fulham (hereafter called 'the site'). The site is bounded to the north by Lots Road, to the east by the River Thames and to the south by Thames Avenue and Chelsea Harbour. The boundary of the Royal Borough of Kensington and Chelsea and the London Borough of Hammersmith and Fulham follows Chelsea Creek, which flows across the middle of the development site. The centre of the site is 526450 176950.

The Lots Road Power Station Development consists of three areas:

- Site A, to the north of Chelsea Creek (Royal Borough of Kensington and Chelsea),
- Site B to the south of Chelsea Creek (London Borough of Hammersmith and Fulham)
- Land at Thames Avenue, to the south of Site B (London Borough of Hammersmith and Fulham).

The monitoring was concerned with Site B and the Land at Thames Avenue (Fig 1).

A series of desk-based assessments have previously been made of the site. An *Archaeological desk-based study* (EAG 1995) was prepared in connection with an earlier development scheme. Subsequently an *Archaeological Impact Assessment*, relating to Sites A and B of the present development scheme (Lakin 2000) was prepared. This was supplemented by a *Geoarchaeological borehole assessment* (Corcoran 2001, revised 2002a), which integrated the results of all previous boreholes known to have been drilled across the site. The geoarchaeological assessment updated the previous understanding of the changing landscape and environmental potential of the site. As a result it recommended that the present phase of geotechnical works should be monitored by a geoarchaeologist.

Geotechnical borehole monitoring was carried out between February and March 2002. An interim report on the results was subsequently prepared (Corcoran 2002b), which recommended submitting 2 samples collected from the geotechnical boreholes for radiocarbon dating. Such dating would enable the changing landscape of the site to be placed within a chronological framework and a more reliable assessment of its archaeological potential to be made. The present report integrates the results of the borehole monitoring with the radiocarbon dates.

Planning and legislative framework

The Planning and legislative background to the site has been adequately summarised in the previous *Archaeological (Impact) Assessment* (Lakin 2000 section 2).

Planning background

This report has been prepared in support of an application for planning consent for the conversion of the main power station building to mainly residential use, the demolition of the remaining buildings and industrial structures and the construction of substantial new residential blocks.

Origin and scope of the report

The report was commissioned by Waterman Environmental on behalf of their client Circadian Ltd and produced by the Museum of London Archaeology Service (MoLAS).

Monitoring of test pits or boreholes, even when these are not primarily designed for archaeological evaluation, may nevertheless be able to provide useful information on the nature and extent of archaeological deposits. According to the most recent English Heritage guidelines (English Heritage, 1998) this will 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

Geoarchaeological monitoring of the boreholes was thought to be appropriate, as it was expected that only a low level of cultural remains would be preserved in the alluvium on the site, but there was likely to be good potential for the reconstruction of the prehistoric and historic landscape inhabited by people in the past from soils, sediments and their ecological inclusions. Such topographical data, which provides information about past environments is increasingly required by English Heritage, in order to better understand the distribution of archaeological sites and the activities of people in the past (English Heritage 2002, 17).

Aims and objectives

The purpose of the monitoring is to refine the previous assessment of the archaeological potential of the site and provide more specific information about the archaeological / alluvial deposits present, in particular relating to their date, nature and significance. This will enable a better-informed decision to be made about the level of further archaeological work, if any, required on the site.

General

The aim of a geoarchaeological investigation is to examine *in situ* soils and sediments in plan and section (or using borehole and augering techniques if necessary[1]) and to take samples as appropriate.

[1] Purposive geoarchaeological augerholes and boreholes are frequently used where standard evaluation trenches or excavation would be impracticable (ie inaccessible, dangerous or expensive). This might be because of the depth

The objectives are to:

- report in detail on the nature of a sites' stratigraphy and to determine how and when this formed
- assess the potential of any preserved ecological remains for reconstruction of the changing landscape and environment for specific time frames.
- identify horizons which might:
    - provide data on past environments and resource availability
    - represent elements of the landscape known to have been the focus of human activity in the past
    - represent events which are likely to have had an impact on local human occupation and activities
    - have been deposited or transformed as a result of human activities
    - contain indirect evidence of local human activity.
- provide sufficient information to assess whether the sediments existing on the site are of great enough value to warrant further, more detailed on- or off-site, archaeological or ecological investigation.

Data obtained will relate to the date of the deposits, the soil and sediment characteristics and the conditions under which they accumulated, the preservation of microfossil remains, and the identification of any trends within the profile.

The value of this information will be assessed in terms of its potential to address archaeologically driven research questions. These are most likely to be concerned with the reconstruction of the changing landscape and ecology in this area during the Late Pleistocene / Holocene; and with the interaction of climate change, relative sea level fluctuations, landscape evolution and human activity and impact on the landscape.

Site specific

The aim of the monitoring this most recent phase of geotechnical work on the site was to:

- Accurately describe the sediment sequence in borehole 1-8 in terms of its geoarchaeological characteristics.
- Obtain samples of peat / humic mud or wood for radiocarbon dating, as appropriate.

The objective was to refine the reconstruction of the changing Holocene landscape of the site and its archaeological and palaeoenvironmental potential, as set out in the previous desk-based assessments. In particular, it was hoped that the following research objectives, proposed in the *Archaeological Impact Assessment* (Lakin 2000) might be addressed:

- Do the peat deposits noted in the geotechnical boreholes reflect a former land surface?

---

of the archaeological deposits, a high water-table, the nature of the sediments anticipated or the thickness of the ground-slab.

- What is the date of this surface?
- In what conditions were the peats deposited?
- Do they contain evidence for the immediate environment in this period?
- Do they contain any evidence for human activity on the site in this period?
- Is there any evidence for activity on the site in historic periods?
- What is the nature of that activity?
- Can the full extent of truncation be determined?

Topographical & Historical Background

The topographical and historical background to the site has been discussed in the previous *Archaeological (Impact) Assessment* (Lakin 2000, section 3). In addition, the geology, topography, past environment and changing landscape of the site and its relevance for archaeological survival was summarised in the *Geoarchaeological borehole assessment* (Corcoran 2002a).

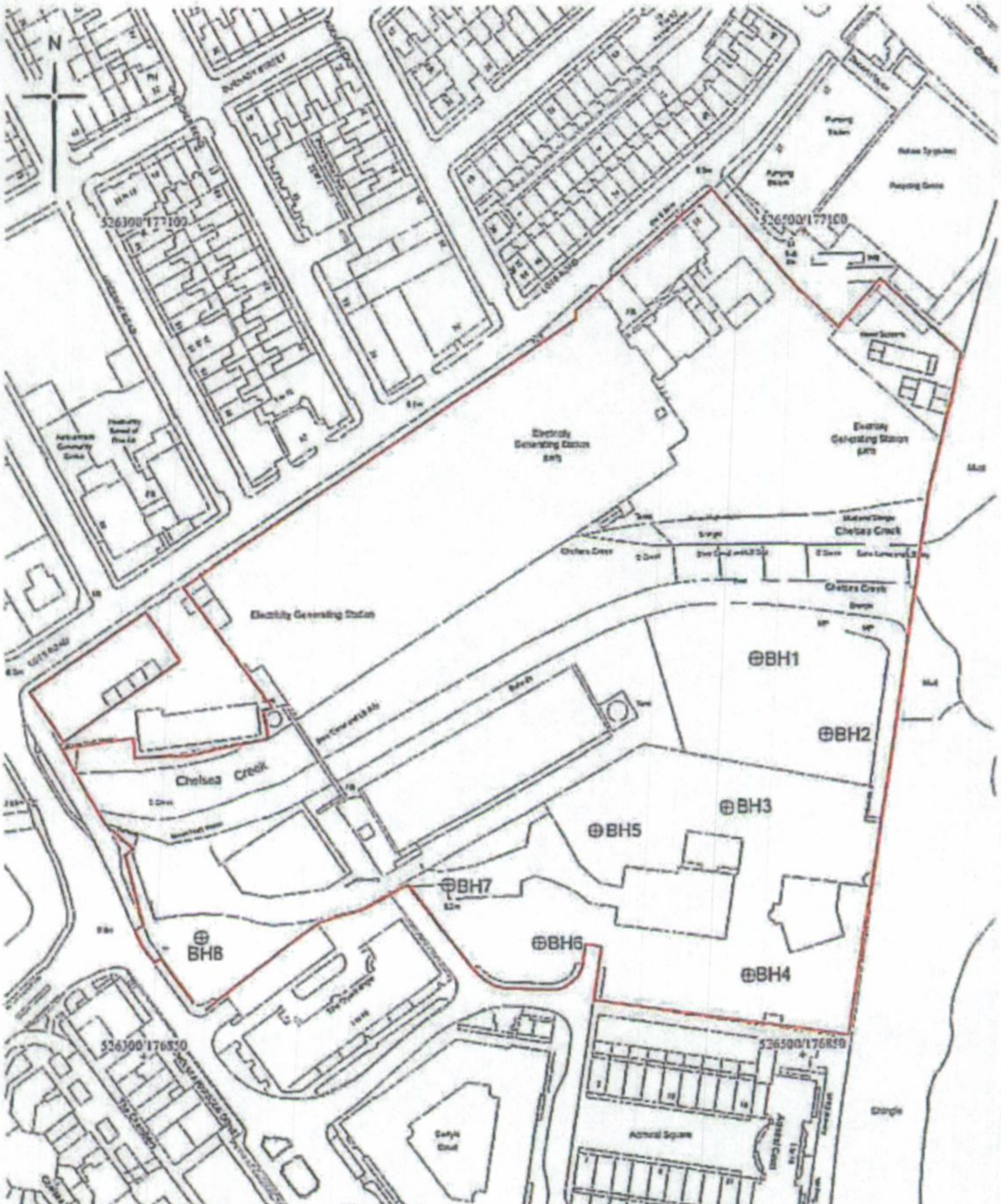

Fig 2 Borehole locations

The geotechnical monitoring

Methodology

On site

Eight boreholes were drilled using a cable percussion drilling rig sub-contracted by the main contractors, and monitored by a MoLAS geoarchaeologist.

The sequence of deposits in each borehole was logged by the geoarchaeologist on site. Description aimed to characterise the visible properties of each deposit in particular relating to its texture, structure, colour, inclusions and evidence for depositional and post-depositional processes.

Each lithostratigraphic unit was given a separate context number.

Where appropriate (and possible) samples from close to the top and base of organic deposits were taken for radiocarbon dating.

The boreholes were located by the contractors and subsequently plotted onto the OS grid (Fig 2). The heights of boreholes were recorded relative to Ordnance Datum by MoLAS, via a traverse to the OS benchmark on the north side of the power station situated on Lots Road (5.94m OD).

Off site

Adjacent contexts in each borehole with characteristics representing a similar environment were amalgamated into a series of sub-groups.

The results of the boreholes were compared. Similar sub-groups, in terms of lithology and composition, occurring in adjacent boreholes were linked and allocated to a series of 'facies'. The facies are preliminary site-wide deposits representing different sedimentary environments. They are used as an aid to presenting and discussing the data and provisionally interpreting the results.

Two selected samples were submitted for radiocarbon dating.

The deposit sequence identified during the earlier borehole assessment was compared with the results of the present borehole monitoring. *Appendix 1* relates the sequence of deposits recorded in the earlier boreholes to the facies identified during the present geotechnical works. The locations of the earlier boreholes are shown on Fig 3.

The OD level of the surface of floodplain gravel in each borehole was used to construct a revised contour plot of the sub-surface topography of Site B and Land at Thames Avenue, prior to alluvial deposition (Fig 3).

The OD level of the contacts between the different facies in each borehole profile were used to construct a north-south cross-section across Site B and the Land at Thames Avenue (Fig 4), which includes data from the previous geotechnical works as appropriate.

The site records can be found under the site code LRP02 in the MoL archive.

Results

Stratigraphy

The eight boreholes monitored were numbered 1-8 by the contractors. BH5 was abandoned as an obstruction was encountered. It was replaced by BH5a. The locations of the boreholes are shown on Fig 2. The results are summarised in the following tables (more detailed logs can be found in the site archive) and discussed in the synthesis section (0).

Table 1: Profile - Borehole 1

Height of interface	Thickness (metres)	Description	Possible interpretation	Facies
5.61m OD		*Ground level*		
	3m	Black sooty gritty coal and clinker rich silty loam. Occasional brick / tile pot cement and mortar.	Modern dumps and levelling associated with railway yard	I
2.60m OD				
	1m	Smooth, wet, soft and gritty clay silt. Frequent lenses of slag, clinker, sand and brick rubble. Clasts of silty alluvium and frequent hair roots.	Modern/Victorian dredged deposits. Or dumping onto a muddy foreshore, from adjacent industrial area.	G or H
1.60m OD				
	0.20m	Soft smooth greenish grey clay silt.	Of Late Iron Age / Roman (and later) date (^{14}C: 360BC-AD80 at base) Needs ecological information and more detailed examination of the *in situ* deposits in a core / section to provide a more reliable reconstruction. But probably represents grassy meadowland with mosaic of drier hummocks and peat-filled hollows. A greater incidence of seasonal (or possibly daily, tidal) flooding occurs through time.	D
1.40m OD				
	0.20m	Felt-like peat – well-humified with frequent hair roots.		
0.80m OD				
	0.10m	Brownish grey-green clay silt with faint bedding traces.		
0.60m OD				
	0.40m	Felt-like peat – well-humified with frequent hair roots. Radiocarbon sample (^{14}C): LRP(BH1)0.5		C
0.15m OD				
	>0.75m	Sandy gravel	In channel location with fast flowing water (Late Pleistocene)	A
		Base of observations at *c* ⁻0.50m OD		

Table 2: Profile - Borehole 2

Interface	Thickness	Description	Possible Interpretation	Facies
5.48m OD		*Ground level*		
	1m	Brown humic loam with hair roots	Modern topsoil and landscaping	I
4.50m OD				
	1.50m	Coal and clinker rich gritty loam	Coal dumps and levelling	
3.00m OD				
	0.50m	Gravelly gritty minerogenic mud	Muddy foreshore or redeposited alluvium	G&H
2.50m OD				
	2m	Compact lenses of iron stained (brown) and blue grey clay silt. Some gravel, coal, brick and tile.	Redeposited alluvium	
0.50m OD				
	0.20m	Soft blue-green clay silt / silty clay	On-site environment becoming increasingly wet. Transition from dry meadow or woodland floor to fen and standing water, mudflats or seasonal flooding. (Needs more detailed examination of sediments and ecological inclusions to distinguish).	C&D
0.30m OD				
	0.70m	Brown humic mud with plant remains (roots), becomes more peaty downwards		
ˉ0.40m OD				
	>1m	Sandy gravel	In channel location with fast flowing water (Late Pleistocene)	A
		Base of observations at *c* ˉ1.50m OD		

Table 3: Profile - Borehole 3

Interface	Thickness	Description	Possible interpretation	facies
6.88m OD		*Ground level*		
	2.50m	Humic loam with brick/tile, field drain, slag, gravel inclusions, especially in lowest 0.50m.	Modern topsoil / landscaping over rubble dumps and levelling	I
4.40m OD				
	0.60m	Loose crumbly crushed coal and coal dust. Very occasional crished brick.	Fuel (coal) dumps.	
3.40m OD				
	0.50m	Compact sooty loam. Frequent plant remain fragments, with granule-sized clasts of silty-clay (alluvium), brick/tile, pot and coal.	Post medieval soil	F
2.90m OD				
	3.20m	Interbedded brown humic mud, blueish green silty clay and clay-silt with occasional peaty lenses. Common watersnail shells in minerogenic lenses.	Wet water meadow: the deposits are likely to reflect the mosaic of hummocks, hollows and pools of standing water present in a seasonally flooded grassy area.	D
ˉ0.30m OD				
	>1m	Sandy gravel	In channel location with fast flowing water (Late Pleistocene)	A
		Base of observations at *c* ˉ1m OD		

Table 4: Profile - Borehole 4

Interface	Thick	Description	Possible interpretation	Facies
7.06m OD		*Ground level*		
	2.60m	Soil material with brick, coal and slag increasing with depth.	Modern soil and landscaping over modern levelling and make-up	I
4.55m OD				
	1m	Gritty sandy mud with (modern) wood, ash and clinker (wet)	Modern dredging deposits / redeposition of alluvium	H
3.60m OD				
	0.50m	Humic mud, minerogenic mud, peat, gravel and brick rubble lenses.	Redeposited alluvium.	
3.05m OD				
	1m	Soft dark greyish brown peaty humic mud. Frequent shells	Of Iron Age (and later) date (^{14}C: 750-240BC towards base) Most likely represents grassy meadowland with a mosaic of drier hummocks and sedge-filled hollows and occasional periods of more prolonged and widespread flooding.	D
2.05m OD				
	1m	Firm blue grey silty clay with frequent snail shells, becomes more humic to base of unit		
1.05m OD				
	1m	Blue-green minerogenic mud with peaty lenses.		
0.05m OD				
	1m	Peat with occasional silty clay lenses. Radiocarbon sample (^{14}C): LRP(BH4)-0.5		C
-0.85m OD				
	>1m	Sandy gravel	In-channel location with fast flowing water (Late Pleistocene)	A
		Base of observations at -2m OD		

Table 5: Profile - Borehole 5a

Interface	Thick	Description	Possible interpretation	Facies
6.81m OD		*Ground level*		
	3.80m	Loose, dark grey slightly clayey sandy silt + gravel, brick, wood.	Modern make-up and levelling.	I
3.00m OD				
	0.20m	Firm dark greenish grey gritty slightly sandy silty clay. Crumbly blocky structure with common manganese staining, root fragments and snails.	Weathering and stabilisation of landsurface (ie: lower incidence of flooding)	F
2.80m OD				
	1.60m	Mottled brown and blue grey silty clay. Soft, smooth and sticky. Fine hair roots common.	Rooting suggests 'accretionary soil' (build up of clay through seasonal / episodic flooding) leading to gradual accretion of landsurface developed at surface of sand. But could represent gradual silting-up of former creek or channel or marginalisation from direct influence of river. (Needs diatom evidence to distinguish).	E
1.30m OD				
	1.20m	Dark grey slightly sandy gritty clay. Fine gravel clasts. Iron and manganese stained root channels.		
-0.10m OD				
	0.8m	Grey brown fine to coarse sand with occasional gravel clasts.	Accumulation of Pleistocene / Holocene sand bar.	B
-0.70m OD				
	>0.50 m	Sandy gravel	In-channel location with fast flowing water (Late Pleistocene)	A
		Base of observations at -1.20m OD		

Table 6: Profile - Borehole 6

Interface	Thickness	Description	Possible interpretation	facies
7.23m OD		*Ground level*		
	1.80m	Gritty sandy loam. Frequent concrete, gravel and brick rubble and small lenses of silty clay. The alluvial lenses / clasts increase in size and frequency towards base of unit.	Modern topsoil and levelling	I
	2.20m	Wet sandy clay silt with frequent lenses of pink ashy grit, which dominates central part of unit, decreasing to base where unit becomes gritty sandy clay silt.	Redeposited alluvium and ashy waste material – probably associated with the excavation of the Chelsea Basin in the 19th century (see Lakin 2000, Figure 7).	H
3.25m OD				
	1m	Stiff manganese stained blue-black sandy clay silt with frequent gravel.	Weathering and stabilisation of landsurface (ie: lower incidence of flooding) OR development of muddy foreshore. Need diatom evidence to distinguish.	F
2.25m OD				
	0.60m	Moderately soft greenish blue grey silty clay with watersnail shells and fragments and occasional peaty lenses.	Waterlogging of previously dry landsurface and development of seasonally flooded meadowland.nd increasing flooding / water depth of former landsurface.	D
	0.40m	Humic mud.		C/D
	0.80m	Peaty humic mud / peat		C
0.45m OD				
	0.30m	Mottled greenish yellow and blue coarse sand with humic root channels.	Later rooting and vegetation growth colonising exposed surface of Pleistocene / Holocene sand bar.	B
0.15m OD				
	>0.50m	Sandy gravel	In-channel location with fast flowing water (Late Pleistocene)	A
Base of observations at c ¯0.50m OD				

Table 7: profile - Borehole 7

Interface	Thickness	Description	Possible interpretation	Facies
7.52m OD		*Ground level*		
	3.20m	Loose dark brown humic silty sand. Brick, concrete gravel and charcoal inclusions. Becomes more clayey downwards.	Modern levelling, landscaping and topsoil.	I
	1.80m	Loose light brown slightly clayey silty sand. Brick, gravel and chalk inclusions.		
2.50m OD				
	0.75m	Dark greyish brown slightly sandy silty clay. Fine angular blocky structure. Frequent manganese staining, snails gravel and organic patches. Lower 0.50m is less sandy and less organic	Weathering and stabilisation of landsurface (lower incidence of flooding).	F
1.75m OD				
	0.80m	Mottled brown / blue grey smooth soft silty clay.	Accretionary soil (seasonal / overbank flooding depositing silty clay)	D
	0.50m	Soft mottled grey / brown sandy gritty silty clay		
0.45m OD				
	0.50m	Soft pale brown clayey silty sand. Both iron-stained and gleyed root channels.	Vegetation colonising surface of sand bar and stabilising its surface.	B
		Base of observations at 0m OD		

Table 8: Profile - Borehole 8

Interface	Thickness	Description	Possible interpretation	Facies
6.95m OD		*Ground level*		
	3m	Brown gritty silty clay / clay silt. Blocky structure. Frequent brick / tile gravel and charcoal inclusions. Grit and inclusions decrease downwards and clay content increases.	Modern levelling and landscaping	I
	3.50m	Brown silty clay. Gravel inclusions and small fragments of brick and mortar		
0.45m OD		Mottled grey brown silty clay. Snail shell inclusions. Blocky structure and frequent iron-staining.	Weathered surface of alluvium.	F
	0.50m			
Base of observations at ¯0.05m OD Observations did not continue to floodplain gravel.				

Radiocarbon dating

Two sub-samples were submitted for Radiocarbon (^{14}C) age estimation. They were taken from the organic deposits found immediately above gravel in BH1 (at some distance from the present river) and BH4 (closer to the river).

The samples were collected from the disaggregated sediment as brought up in the baler and are therefore not as precise, in terms of the exact level they represent, as a carefully controlled slice cut from a U4/100 tube or excavated section. They can, however, unquestionably be related to the accumulation of 'facies C' in both cases. The samples are uncontaminated (cut from the centre of peat clasts) and the dates obtained are certainly reliable, in terms of accuracy.

Context	Elevation	Material	MoLAS ref.	Purpose
BH1	*c* 0.50m OD	Fibrous organic material	LRP(BH1)0.5	To date the organic unit (and possible waterlogging of a former dryland soil) above the area of higher sand and gravel in the central part of the site.
BH4	*c* ⁻0.50m OD	Organic soil material	LRP(BH4)-0.5	To date the organic unit (and possible waterlogging of a former dryland soil) above the eastern part of the site.

Table 9: Radiocarbon samples

The ^{14}C age estimates, made by Beta Analytic[2] are presented in the table below.

MoLAS ref.	Lab no.	Uncalibrated date	calibrated date*
LRP(BH1)0.5	Beta - 166691	2080+/-80 BP	360BC to AD 80
LRP(BH4)-0.5	Beta - 166692	2350 +/-60 BP	750 to 700BC *OR* 540 to 360BC *OR* 280 to 240BC

Table 10: Results of radiocarbon dating

Comments on the radiocarbon dates

The dates show that the peat had begun to accumulate towards the eastern limit of the site, at ⁻0.5m OD, at some time during the Iron Age. By the late Iron Age / Early Roman period it was developing across the higher parts of the site (*c* ⁺0.5m OD).

This suggests it was forming as a result of rising water (river) levels, which caused land at progressively higher elevations to become waterlogged. This corresponds well with the Neolithic date for peat found at ⁻2m OD slightly downstream of the site (see Corcoran 2002a, Section 2.2).

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[2] Calibration was provided by Beta Analytic, using the calibration data published in Stuiver, M. *et al* (1998) *Radiocarbon Vol.40 No.3* and is quoted to 98% confidence levels.

Facies

The results of the boreholes were compared. Similar sub-groups, in terms of lithology and composition, occurring in adjacent boreholes were linked and allocated to a series of 'facies'. The facies are preliminary site-wide deposits representing different sedimentary environments. They are used as an aid to presenting and discussing the data and provisionally interpreting the results.

The characteristics and outline interpretation of the environment represented by each facies is given in Table 11 below.

Facies	Characteristics	Possible interpretation
I	Humic loam, brick rubble, coal, etc	Modern and Victorian dumps, landscaping and use of the site.
H	Lenses of peat, gravel, brick-tile and silty clay.	Redeposited alluvium (upcast from dredging, river wall and dock construction).
G	Soft gritty sandy clay silt, with occasional brick, flint gravel and coal inclusions.	Foreshore (probably of post-medieval date)
F	Gritty, sandy silty clay / clay silt with common roots + iron and manganese stained rootchannels. Humic and sooty in its upper part.	Stabilisation of landsurface – less influence from flooding and dominated by weathering / soil forming processes. Post medieval soil development.
E	Clayey sand fining upwards to sandy clay. Evidence for rooting.	Decreasing river energy / influence. Possible transition from a tidal or channel-edge location to one influenced by overbank flooding. Probably an accretionary floodplain soil (building up through additions of silty clay as flood water drains away).
D	Interbedded peat, humic mud and silty clay.	Wet meadowland. Seasonally flooded. A mosaic of drier hummocks, peaty hollows and water and sedge-filled channels.
C	Felt-like peat, with a mesh of hair roots.	Initial waterlogging of the well-vegetated (possibly woodland floor) landsurface. Found at progressively later date at higher elevations.
B	Sand with gleyed, iron and manganese-stained root channels.	Formed at the margins of a (possibly) meandering river channel in the early Holocene or Pleistocene. Colonised by vegetation and forming the subsoil of a prehistoric dry landsurface.
A	Sandy gravel	Pleistocene, cold climate, braided river channel deposits

Table 11: The facies identified in the boreholes

In addition, the deposit sequence identified during the earlier borehole assessment has been compared with the results of the present borehole monitoring. A revised 'Table 1' as included in the earlier versions of the previous *Geoarchaeological borehole assessment,* but unfortunately omitted from the final version (Corcoran 2002a), is included here as *Appendix 1*, which sets out the sequence of deposits in each intervention and relates them to the facies as defined in this report.

Synthesis of results

The results of the geotechnical monitoring have been able to refine the initial desk-based assessment of the sub-surface stratigraphy of the site, as discussed below:

Floodplain gravel

Lateglacial, 15,000-10,000 years ago: Late Upper Palaeolithic

Each borehole (except BH8) was monitored through made ground and alluvial deposits and into the top of the underlying floodplain sand and gravel. Although the gravel (facies A) was deposited at some time between 15,000-10,000 years ago, it is unlikely to contain *in situ* Late Upper Palaeolithic material, as it was almost certainly deposited by fast flowing meltwater in the arctic climate that existed at the end of the last Ice Age, when large quantities of coarse gravel was available in a poorly vegetated landscape. The gravel was probably deposited in a network of ephemeral channels, similar to those that characterise the braided rivers observed in arctic regions today. The gravel is probably the Shepperton Gravel of the Thames, which grades upstream into a laterally equivalent gravel deposit that underlies the valley of the Chelsea Creek (Gibbard 1985, 86).

The surface of floodplain gravel was observed at levels that correspond well with those found and predicted in the desk-top assessment. This supports the previous interpretation of a gravel 'high' area in the central part of Site B, with its surface lying at approximately 0.5m OD (see Fig 3). The results of BH6, situated in the previously un-examined south-west part of the site show that the higher gravel continues southwards, through the western half of the Land at Thames Avenue. The gradual slope of the gravel surface towards the east (to –0.4m OD in BH2) and south-east (to –0.8m OD in BH4) of the site was also consistent with the earlier records. No boreholes were located close enough to the extreme south-east corner of the site to record the very low gravel (below –1.5m OD) previously recorded in this area.

A sand deposit (facies B) was recorded above floodplain gravel in all the boreholes drilled in the western part of the Land at Thames Avenue (ie: BH5, 6 & 7). The sand was highest (0.4m OD) in BH6. It is uncertain whether the sand was deposited by the late Pleistocene braided river, or by a meandering river of the early Holocene (see Sidell *et al*, 2000). The sand appears to be banked against the gravel 'high' and effectively brings the pre-alluvial surface in this area up to about 0-1m OD.

The irregular surface of the sand and gravel influenced the subsequent environment of the area during the Holocene.

Dry landsurface (evidence for soil formation)

Early to mid Holocene, 10,000-3,000 years ago: Mesolithic to later Bronze Age

Humic roots and iron and manganese stained root channels were observed within the sand. This rooting suggests that vegetation colonised the exposed sand bars, which subsequently formed the subsoil of a dry landsurface, prior to the waterlogging of the site by rising river levels. This information confirms the suggestion put forward in the assessment report that a soil may have existed at the surface of the high gravel overlain for the most part by sand in the central part of Site B and in the western part of the Land at Thames Avenue. The sandy soil would have been very suitable for early agricultural activity, being light to work and quick to warm up in spring and summer.

A dry landsurface would also have existed above the sloping gravel towards the east and south east of the site in the Mesolithic and Neolithic periods. But the radiocarbon dates have shown that, as the river level rose during the prehistoric period, lower lying parts of the site would have become progressively inundated.

Although no environmental evidence exists for the soil itself (as organic material was likely to have decayed in the dry sandy aerated environment), as it became waterlogged peat developed at its surface. Thus the peat, which can be radiocarbon dated, represents the transition from a dryland soil to a wetland environment. The slightly earlier date for the peat lying above gravel at about $^{-}$0.5m OD in borehole 4 (between 750-240BC) than peat lying above gravel at about $^{+}$0.5m OD in borehole 1 (between 360BC-AD80) suggests that peat progressively developed at higher elevations as the river level rose (see Fig 3).

Site B and the western part of the Land at Thames Avenue would have remained a diminishing area of dry land when the lower-lying eastern parts of the site became inundated. Being close to the higher, drier land of the river terrace (which is followed by Lots Road) and adjacent to the confluence of the Chelsea Creek and the Thames, the dryland on the site would have acted as a focal point for prehistoric people exploiting the rivers and expanding marshland. It is therefore likely to have good potential for the recovery of evidence for prehistoric activity. Elsewhere evidence for cultivation, finds and cut features have been found in similar topographical locations (see *Geoarchaeological borehole assessment*, Corcoran 2002a, Section 2.2).

Wetland environment (peat / organic deposits)
Middle to later Holocene: Iron Age and historic
A peat deposit (facies C), between 0.5 and 1m thick overlies the floodplain gravel and sand and has overprinted the probable soil deposits across much of the eastern part of the site (see Fig 4). As discussed above it is likely to represent the initial waterlogging of the previously dry landsurface that existed on the site in the earlier prehistoric period. The surface of the peat lies at around 1m OD in BH6 (base at 0m OD) and slopes down to around 0m OD in BH2 and BH4 (where its base is at –0.5 and –0.8m OD respectively). It thus follows the sloping surface of the underlying sand and gravel.

Nowhere was the peat as low as that recorded in previous geotechnical boreholes drilled adjacent to the present river, however. In these earlier boreholes peat was recorded at levels as low as –2m OD, which may correspond to the peat associated with timber, thought to be the remains of a floodplain forest, observed at similar levels on the present foreshore at low tide and dated to the Neolithic (see *Geoarchaeological borehole assessment*, Corcoran 2002a, Section 2.2). Viewed together with the Iron Age date obtained for the lower part of the peat (at $^{-}$0.50m OD) in BH4 and the Iron Age / Early Roman date for the peat at $^{+}$0.50m OD in BH1 (see section 0) this suggests that the basal peat unit (facies C) is 'time transgressive'. It appears to have developed at a later date at progressively higher elevations as river level rose in the later prehistoric period. By the Roman period the entire site, where not traversed by the river or tributary streams and creeks, was likely to have been wet, seasonally inundated marsh or meadowland.

The peat is likely to preserve good assemblages of pollen, plant macro remains and insects. Very little is known about the Iron Age / immediately pre-Roman environment (and archaeology) of this area (or Greater London as a whole) and it is likely that any further work, which targeted the organic deposits surviving immediately above sand and gravel would provide useful information about the evolving landscape of the site and its environs.

Peat was not recorded in BH5, 7 and 8. It is likely that in these locations, if peat had once existed, it was later eroded by tidal creeks and channels. Another area where no basal peat, or peaty lenses further up the sequence, occurs is in the extreme western part of the site (see Fig 3 and the geotechnical data obtained from the earlier work on the site, summarised in Appendix 1). Here too an environment more dominated by fluvial activity may have existed in the prehistoric or historic past.

Minerogenic clay and silt deposits

(Probably late Holocene, mostly of historic date)

The minerogenic deposits present on the site form four distinct facies (D, E, F and G). Where peat survives at the base of the alluvial sequence, it is overlain by fine-grained minerogenic clays and silts, which have frequent peaty / humic lenses and well preserved snail and plant remain inclusions. These interbedded minerogenic and organic deposits (facies D) are characteristic of a seasonally flooded meadow landscape, suitable for grazing. It was probably a mosaic of drier grassy hummocks and peaty hollows traversed by sedge-filled channels. It is likely that such an environment existed on much of the site (in particular those areas within the dashed lines on Fig 3) from the Iron Age to immediately pre-Victorian periods.

The distinct clay beds recorded in some of the boreholes within facies D probably represent periods of prolonged flooding that occurred at times within this period. In particular, the sandy clay silt recorded in several boreholes (* on Fig 3) might relate to a period of increased fluvial activity and flooding. It may correspond with the increased river scour and flooding that is known from local sites, such as Chelsea Bridge Wharf, QST01 (Corcoran 2002c) and Westminster (Sidell *et al* 2000) during the medieval period.

In contrast, in parts of the site (BH5 and, in the previous geotechnical boreholes, to the north and west of BH7) no peat or peaty lenses were recorded. Instead a 'fining-up' sequence from sandy clay-silt to silty clay was found (facies E). This is more indicative of decreasing river influence and possibly the transition from an active, perhaps tidal mudflat, situation to one dominated by seasonal flooding. As suggested above it is likely that these parts of the site may have been more directly influenced by the river at some time in the past, perhaps because the course of the Thames or Chelsea Creek was previously closer to these parts of the site. Diatom evidence would be useful here, to establish which deposits were subject to direct tidal / estuarine influence.

Post medieval and recent deposits

The upper part of the minerogenic alluvium was weathered in BH5, 6 and 7. It was characterised by manganese and iron-staining along former root channels, a more crumbly, blocky structure and frequent grit and fine gravel inclusions (facies F). It was found between about 1.75-3.25m OD. The weathered alluvium is likely to represent a more 'stable' land-surface, less influenced by the accretion of fine-grained sediment through flooding. This deposit probably formed during the post medieval period and formed the subsoil of the post-medieval / pre Victorian soil, which was observed in BH3, where the weathered alluvium merged into a sooty, gritty loam, with a surface at *c* 3.5m OD. It is possible that the post medieval / pre-Victorian landsurface on the inner part of the site (away from the Chelsea Creek and Thames foreshores) lay at around 3.5m OD. This landsurface is buried by between 2.5 and 4m of modern made ground and levelling deposits, reflecting the considerable landscaping of the site that has taken place in the Victorian and modern periods.

In BH1 and 2 the upper part of the minerogenic alluvium was also coarser textured and consisted of a gritty and occasionally gravelly clay-silt (facies G), with a surface around 2.5-3m OD. This may represent the more active river conditions of a foreshore that may have been contemporary with the soil (facies F). Within this muddy foreshore deposit occasional coal inclusions were found, suggesting it accumulated in the post-medieval or recent past. It suggests that, prior to its present course, confined within a man-made channel, the Chelsea Creek may have directly influenced a wider area at its mouth. In BH2 the possible foreshore deposit (facies G) overlay about 2m of re-deposited alluvium (recorded between 0.5-2.5m OD) that lay above what was probably the truncated surface of *in situ* alluvium, demonstrating that excavation associated with river defences or landscaping had been carried out in this area.

It was difficult from the boreholes to be certain whether the foreshore deposits (facies G) were *in situ* or redeposited alluvium, derived from dredging and the upcast from construction works. In some instances, however, where clods of peat, alluvium and gravel were brought up, the material was fairly certain to be redeposited alluvium (facies H), as recorded in BH2, 4 and 6 (see tables, section 0). In BH 1 and 2 this was probably as a result of river wall construction, but the redeposited alluvium in BH6 probably relates to the construction of the Chelsea Basin (see *Archaeological Impact Assessment*, Lakin 2000, Figure 7).

Granite setts (of probable 19th century date) were recorded in the test pit close to borehole 6 in the SW corner of the Land at Thames Avenue at around 4m OD (3m below present ground level). Loose coal-rich deposits that probably relate to Victorian/modern fuel stores or railway sidings (see *Archaeological Impact Assessment*, Lakin 2000) were recorded in boreholes 2 and 3, with a surface at around 4.50m OD. Thus prior to modern landscaping the Victorian surface on the site may have been at around 4 or 4.5m OD.

Assessment of the monitoring

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

- The boreholes covered the site comprehensively, allowing geoarchaeological observation of the various lithostratigraphic units recorded during the earlier geotechnical work. This has enabled a more robust assessment of the changing landscape and archaeological potential of the site during the Holocene to be made.
- There is close correspondence between the stratigraphic sequence recorded during the present and previous ground investigation works, which suggests the results are representative and reliable.
- Radiocarbon dating has enabled the changing environment of the site to be placed within a chronological framework, which corresponds well with information previously obtained from elsewhere in the area.
- However, the diameter of a borehole is very small and interpretation of deposits recorded in boreholes is not as reliable as that based on examining sediments exposed in section.
- The depths and thickness of deposits will have been subject to some compaction during the drilling process and should be seen as approximate (they are here rounded to the nearest 0.05m).
- Furthermore, the borehole sampling strategy was designed for geotechnical purposes and on-site recording of the generally disaggregated material brought up in the baler is not as reliable as the more detailed examination possible when a continuous sequence of U4/100 core samples are collected for geoarchaeological purposes, and examined in the lab.
- Given these limitations it is considered that the results of the geotechnical monitoring provide a good indication of the changing environment of the site and the characteristics and archaeological and palaeoenvironmental potential of the sequence of deposits present across the site.

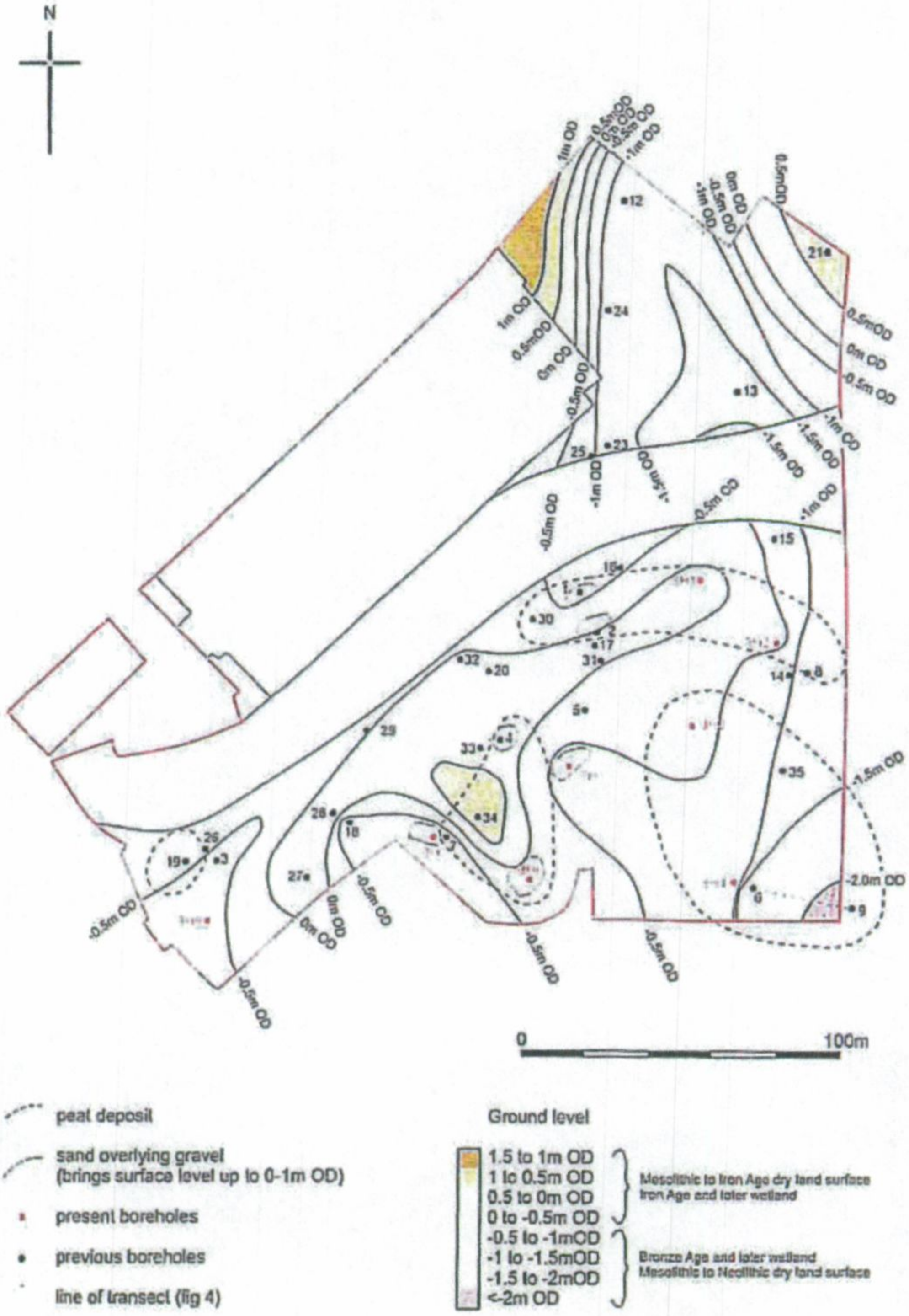

Fig 3 Topography of floodplain gravel surface

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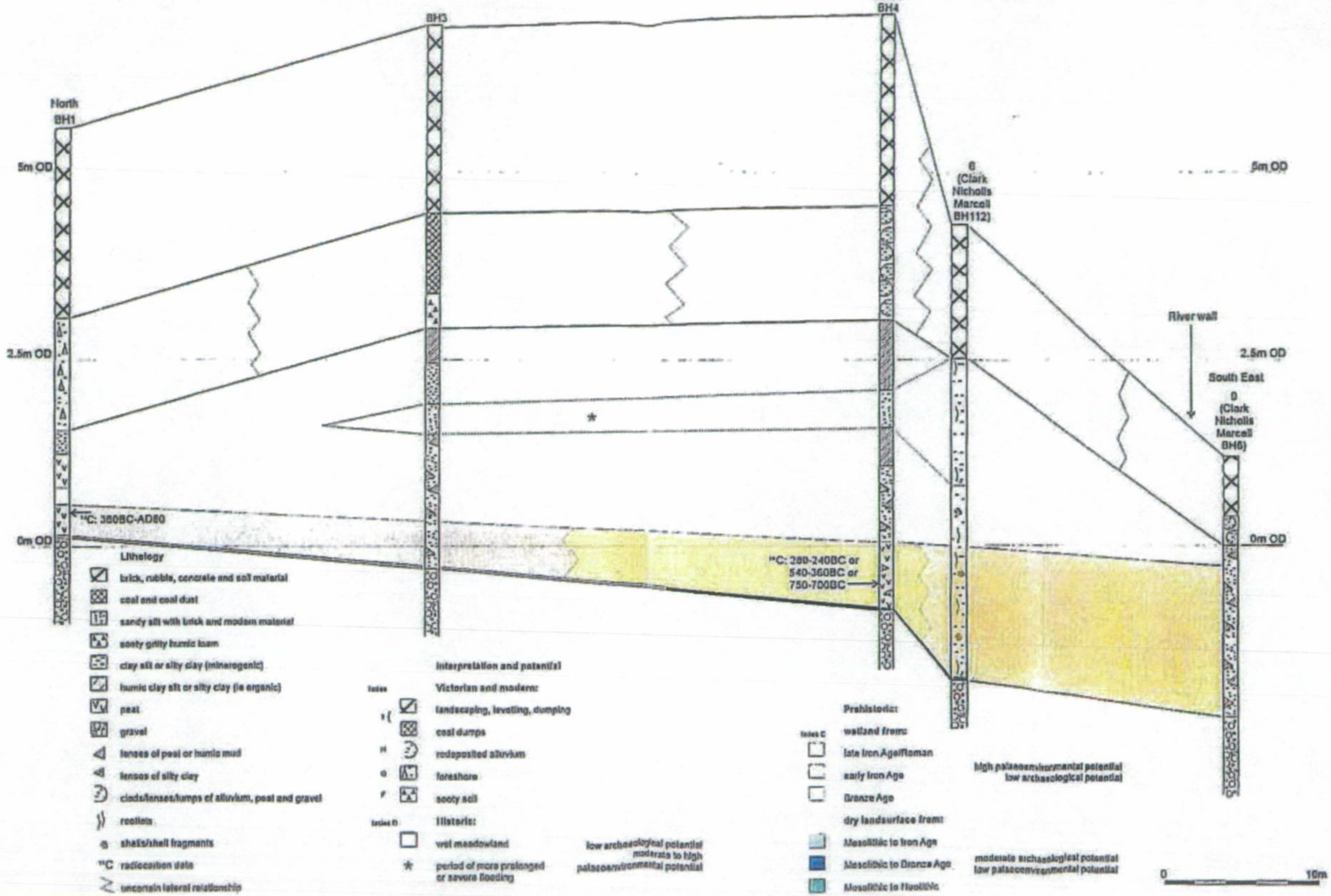

Fig 4 North-south transect across the site