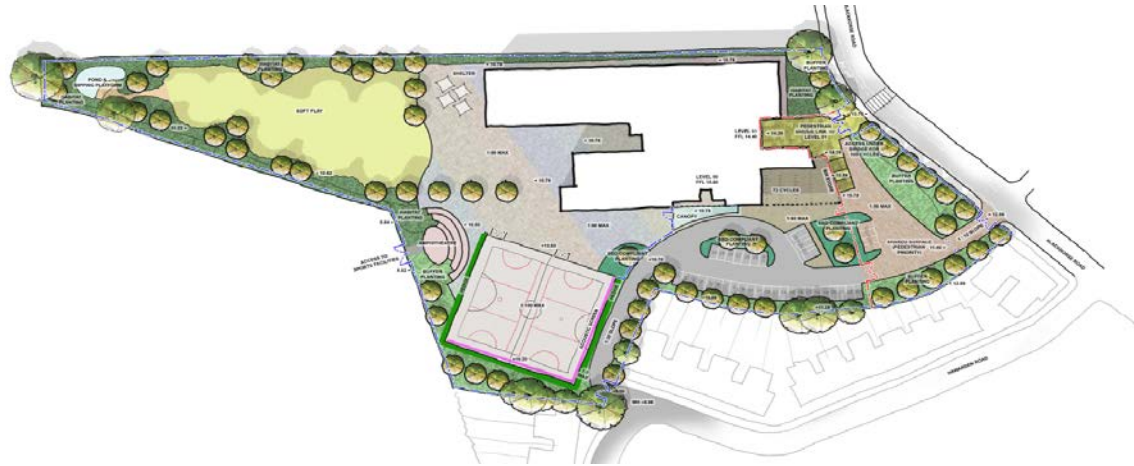




Head Office:
 Elizabeth House
 39 York Road
 London SE1 7NQ
 Tel: 020 7401 0020
 Fax: 020 7401 0030



**Waltham Forest BSF
 WILLOWFIELD HUMANITIES COLLEGE**
PRE-CONSTRUCT ARCHAEOLOGY LTD

*Land at the former British Rail Goods
 Yard/Proposed Willowfield College, Blackhorse
 Road, Walthamstow E17 6NQ: An Archaeological
 Evaluation*

	Name	Signature	Date
Prepared by	N Hawkins		26.4.13
Checked	H Hawkins		29.4.13
Approved	H Hawkins		29.4.13

NTS @ A4
 SCALE & FORMAT

Draft
 PROPOSED STATUS

29.4.13
 DATE OF 1ST ISSUE

000001
 FILE NAME

WHC
 PROJECT

PCA
 ORIGINATOR
 /ISSUER

A19
 DISCIPLINE/
 TRADE

A1
 BUILDING/
 AREA

SRE
 TYPE

FON
 LEVELS &
 LOCATIONS

SEQUENCE NUMBER

0
 REVISION

**FORMER BRITISH RAIL
GOODS YARD/PROPOSED
WILLOWFIELD COLLEGE,
BLACKHORSE ROAD,
WALTHAMSTOW E17 6NQ**



**LONDON BOROUGH OF
WALTHAM FOREST**



REPORT NO: R11416

APRIL 2013



LAND AT FORMER BRITISH RAIL GOODS YARD/PROPOSED WILLOWFIELD COLLEGE, BLACKHORSE ROAD, WALTHAMSTOW, LONDON BOROUGH OF WALTHAM FOREST, E17 6NQ

AN ARCHAEOLOGICAL EVALUATION

SITE CODE: GDY 13

LOCAL PLANNING AUTHORITY: LONDON BOROUGH OF WALTHAM FOREST

PLANNING APPLICATION NUMBER: PRE-PLANNING

CENTRAL NGR: TQ 3587 8929

WRITTEN AND RESEARCHED BY: NEIL HAWKINS
PRE-CONSTRUCT ARCHAEOLOGY LIMITED

PROJECT MANAGER: HELEN HAWKINS (MIFA)

COMMISSIONING CLIENT: BOUYGUES (UK) LIMITED

CONTRACTOR: Pre-Construct Archaeology Limited
Unit 54, Brockley Cross Business Centre
96 Endwell Road
Brockley
London, SE4 2PD

Tel: 020 7732 3925

Fax: 020 7732 7896

E-mail: hhawkins@pre-construct.com

Website: www.pre-construct.com

© Pre-Construct Archaeology Ltd

April 2013

© The material contained herein is and remains the sole property of Pre-Construct Archaeology Limited and is not for publication to third parties without prior consent. Whilst every effort has been made to provide detailed and accurate information, Pre-Construct Archaeology Ltd cannot be held responsible for errors or inaccuracies herein contained

DOCUMENT VERIFICATION


Site Name

**FORMER BRITISH RAIL GOODS YARD/PROPOSED
WILLOWFIELD COLLEGE, BLACKHORSE ROAD,
WALTHAMSTOW**

Type of project

Archaeological Evaluation

Quality Control

Pre-Construct Archaeology Limited Project Code			K3064
	Name & Title	Signature	Date
Text Prepared by:	N Hawkins		26.4.13
Graphics Prepared by:	J Simonson		26.4.13
Graphics Checked by:	J Brown	<i>Josephine Brown</i>	29.4.13
Project Manager Sign-off:	H Hawkins		29.4.13

Revision No.	Date	Checked	Approved
1 (client comments)	9.5.13	HH	HH

Pre-Construct Archaeology Ltd
Unit 54
Brockley Cross Business Centre
96 Endwell Road
London

CONTENTS

1	ABSTRACT	3
2	INTRODUCTION.....	4
3	PLANNING BACKGROUND AND EVALUATION OBJECTIVES.....	5
4	GEOLOGY AND TOPOGRAPHY	7
5	ARCHAEOLOGICAL AND HISTORICAL BACKGROUND	8
6	METHODOLOGY	9
7	ARCHAEOLOGICAL PHASE DISCUSSION	10
8	CONCLUSIONS	12
9	BIBLIOGRAPHY	13
10	ACKNOWLEDGEMENTS	14

FIGURES

FIGURE 1: SITE LOCATION	15
FIGURE 2: TRENCH LOCATION	16
FIGURE 3: SECTIONS	17

APPENDICES

APPENDIX 1: CONTEXT INDEX.....	18
APPENDIX 2: SITE MATRIX	19
APPENDIX 3: OASIS REPORT FORM	20
APPENDIX 4: PLATES	23
APPENDIX 5: PALAEO-ENVIRONMENTAL REPORT (QUEST)	28
APPENDIX 6: WRITTEN SCHEME OF INVESTIGATION FOR AN ARCHAEOLOGICAL EVALUATION AT THE FORMER BRITISH RAIL GOODS YARD/PROPOSED WILLOWFIELD SCHOOL, BLACKHORSE ROAD, WALTHAMSTOW E17 6NQ LONDON BOROUGH OF WALTHAM FOREST	33
APPENDIX 7: AN ARCHAEOLOGICAL WATCHING BRIEF AT THE BRITISH RAIL GOODS YARD, 213-215 BLACKHORSE ROAD, WALTHAMSTOW, LONDON BOROUGH OF WALTHAM FOREST	34

1 ABSTRACT

- 1.1 This report details the results of an archaeological evaluation undertaken by Pre-Construct Archaeology Limited on land at the Former British Rail Goods Yard/Proposed Willowfield College, Blackhorse Road, Walthamstow, London Borough of Waltham Forest, E17 6NQ.
- 1.2 The evaluation consisted of five evaluation trenches, two of which were deep stepped trenches (Trenches 3 and 4) located in the footprint of the proposed development. The three remaining trenches (Trenches 1, 2 and 5) were excavated to c. 1.2m below ground level as they were located in areas of lower impact by the proposed development.
- 1.3 Natural terrace gravels were recorded in two of the evaluation trenches illustrating the natural topographical slope from the northeastern corner of the site down sharply to the west and more gradually down to the south. Sealing the gravel was a sequence of naturally deposited alluvial silts, clays and sands which varied in thickness between 1.50m and 2.25m. These extensive alluvial deposits contained neither anthropogenic artefacts nor any organic material but were entirely sterile and homogenous. Further alluvial deposits were encountered within the shallower trenches representing the top level of the alluvium across the site.
- 1.4 Sealing the alluvial deposits in the evaluation trenches were modern levelling deposits. These most likely relate directly to the installation of the railway directly to the north in the late 19th century and the site being used as a goods yard for the railway from the early 20th century onwards.
- 1.5 This report complies with the relevant planning policies. The proposed development will have no impact on significant archaeological remains.

2 INTRODUCTION

- 2.1 An archaeological evaluation was undertaken by Pre-Construct Archaeology Limited on land at the Former British Rail Goods Yard/Proposed Willowfield College, Blackhorse Road, Walthamstow, London Borough of Waltham Forest, E17 6NQ.
- 2.2 The site is an irregular shaped parcel of land bounded to the east by Blackhorse Road, to the north by the Gospel Oak-Barking railway line, to the south by buildings fronting onto Hawarden Road and to the west by playing fields. The site is centred at NGR TQ 3587 8929 (see Figure 1).
- 2.3 The archaeological works were carried out between 11th and 19th April 2013, and were commissioned by Bouygues (UK) Limited. The work was undertaken in accordance with an approved Written Scheme of Investigation (Hawkins 2013) and following English Heritage guidelines (GLAAS 2009).
- 2.4 Pre-Construct Archaeology Limited has previously undertaken an archaeological watching brief on the site as follows:
- An Archaeological Watching Brief at the British Rail Goods Yard, 213-215 Blackhorse Road, Walthamstow, London Borough of Waltham Forest (Site Code GYW 06); June 2006
- 2.5 The archaeological evaluation was supervised by Neil Hawkins and was project managed by Helen Hawkins, both of Pre-Construct Archaeology Limited. The work was monitored by Adam Single, English Heritage, Archaeology Advisor to the London Borough of Waltham Forest. The site is located partially within an archaeological priority zone as defined by the Borough's Core Strategy.
- 2.6 Five evaluation trenches, two stepped to a maximum depth of 3.6m and three no more than 1.2m deep were excavated, located broadly within the footprint of the proposed development, to investigate and evaluate the stratigraphic sequence of the site as it lies on alluvial floodplain of the River Lea which has a well documented prehistoric and palaeoenvironmental resource.
- 2.7 In accordance with the project brief prepared by Adam Single, Archaeological Advisor to the London Borough of Waltham Forest, specialist palaeo-environmental sampling of the alluvium and gravel was carried out by Pre-Construct Archaeology Ltd's palaeo-environmental subcontractor, QUEST.
- 2.8 The completed archive comprising written, drawn, and photographic records and artefacts will be deposited with the London Archaeological Archive and Research Centre (LAARC).
- 2.9 The site was allocated the unique site code GDY13.

3 PLANNING BACKGROUND AND EVALUATION OBJECTIVES

3.1 National Guidance: National Planning Policy Framework

- 3.1.1 The National Planning Policy Framework (NPPF) was adopted on March 27 2012, and now supersedes most of the Planning Policy Statements (PPSs). The NPPF constitutes guidance for local planning authorities and decision-takers both in drawing up plans and as a material consideration in determining applications.
- 3.1.2 In considering any planning application for development the local planning authority will be guided by the policy framework set by the NPPF, by current Local policy and by other material considerations.

3.2 Regional Policy: The London Plan

- 3.2.1 The relevant regional policy is provided in the London Plan (2011) Policy 7.8. It includes the following policy relating to archaeology within central London:

Policy 7.8 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 DPDs for protecting Scheduled Ancient Monuments and archaeological assets within their area.

3.3 Local Policy: Archaeology in the London Borough of Waltham Forest

- 3.3.1 The London Borough of Waltham Forest LDF Core Strategy was adopted on March 2012. Policy CS12 covers heritage assets including archaeology, which is also covered in draft policy DM29 and contained in the draft Development Management Policies DPD.

'Strategic Objective 12:

Conserve and enhance the Borough's heritage assets whilst maximising their contribution to future economic growth and community well-being.

Policy CS12 - Protecting and Enhancing Heritage Assets

In managing growth and change, the Council will promote the conservation, enhancement and enjoyment of the Borough's heritage assets and their settings such as conservation areas, listed buildings, parks and gardens of local historic interest, archaeological priority zones and other buildings and spaces of local historic value by:

- A) keeping under review heritage designations and designating additional areas, buildings and spaces for protection where justified by evidence;*
- B) carrying out, reviewing and implementing Conservation Area Appraisals and management plans;*
- C) promoting heritage-led regeneration and seeking appropriate beneficial uses and improvements to historic buildings, spaces and areas;*
- D) ensuring improved access to historic assets and improved understanding of the Borough's history.*

Archaeological Priority Zones

15.15 The historic legacy of the Borough means significant areas of land are identified as Archaeological Priority Zones which have particular archaeological interest although significant archaeological remains may survive outside of these designated area. Some of these zones cover extensive areas such as the whole of the Lea Valley, the valleys of The Ching and The Fillebrook Rivers and

areas around former Saxon and Mediaeval settlements such as Chingford, Walthamstow, Leyton, Highams Park and Leytonstone. All archaeological remains require policy protection.'

3.4 The Written Scheme of Investigation (Hawkins 2013) highlighted the following primary objectives:

- To determine the natural topography of the site.
- To determine the geoarchaeological sequence at the site, and to record the alluvial/fluvial deposits associated with the River Lea.
- To establish the presence or absence of prehistoric activity, whether settled occupation or artefact scatters at the top of the gravel.
- To establish the nature, date and survival of activity relating to any archaeological periods at the site.
- To establish the extent of all past post-depositional impacts on the archaeological resource.

4 GEOLOGY AND TOPOGRAPHY

- 4.1 The British Geological Survey (Sheet 256 North London) shows the geological sequence on the site as superficial deposits of Quaternary River Terrace Deposits (Sand and gravel) of the Taplow Gravel Formation. The underlying solid geology comprises Eocene clay, silt and sand of the London Clay Formation. To the west of the site alluvium is noted.
- 4.2 An archaeological watching brief of geotechnical boreholes, trial pits (both machine and hand-excavated) and window samples was carried out on the site in 2006 (Pre-Construct Archaeology Ltd 2006). London Clay 'bedrock' was recorded across the site, sealed by a deposit of Thames terrace gravels, also across the entire site. These deposits were both observed to rise toward the east of the site. They were sealed by a layer of alluvium which was overlain by a possible horticultural horizon. Ground levelling most likely associated with 19th and 20th century activity was also observed. The sequence across the site was completed by later 20th century accumulated layers of made ground.

5 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

5.1 General

- 5.1.1 The site is located partially within an Archaeological Priority Zone (APZ) as defined by the London Borough of Waltham Forest Core Strategy (2012).
- 5.1.2 The Archaeological Desk-Based Assessment (Miles 2004) contains an account of the known archaeological and historical background to the site. The archaeological content of this document is summarised below.

5.2 Prehistoric

- 5.2.1 During the prehistoric period much of the area close to the River Lea would have been wet and marshy with pools of water separated by boggy ground. There would have been many small channels surrounding higher areas of sandy islands. Areas such as this would have been exploited by Mesolithic people for food, fish and waterfowl, as well as raw materials such as reeds and willow. Mesolithic activity in this period is well known from peat deposits in the Rammey Marsh to Broxbourne area, further upstream in the Lea valley.
- 5.2.2 The Neolithic period in the Lea valley saw a gradual increase in riverside occupation sites of a more permanent nature with evidence of houses, pits and waste. There was a definitive move of activity across the Lea valley from the western area that had been occupied during the Mesolithic to the lower middle and east of the valley onto the alluvial areas. Subsistence strategies continued to include the gathering of local produce such as nuts, fruits and shellfish.
- 5.2.3 The Upper Lea Valley has evidence for Bronze Age/Iron Age settlement in the form of crannogs; dwellings set on piles driven into marginal areas of wetlands. Three such settlements are known; Warwick Reservoir, Banbury reservoir in Chingford and Low Maynard Reservoir, discovered in c. 1869, which lies 500m west of the site.

5.3 Roman

- 5.3.1 The Lea was likely to have been an important routeway in the Roman period. It may have been used to supply the London area both with agricultural produce and, in the late period, with pottery from Much Hadham, via the River Stort. However, little evidence has been found for settlement on the eastern side of the Lea valley or within the vicinity of the site.

5.4 Saxon and Medieval

- 5.4.1 The area of the site is likely to have been marginal during the Saxon and medieval periods and is not likely to have had any occupation. Documentary evidence shows that Forest Road was known as Claistrete in 1438 and formed part of the main route from Epping and beyond to Tottenham. Blackhorse Road was already in use as a lane by the end of the 17th century and its origins are probably much earlier. The 14th century moated manor house of Low Hall was located c. 1km south of the site.

5.5 Post-Medieval

- 5.5.1 Both the 1800 Milne Land Use map and the 1876 Ordnance Survey map show the site to be arable, agricultural land. In 1894 the railway came to Walthamstow, which drastically changed the general area. The area of the site was in use as a goods yard for the railway by 1913.

6 METHODOLOGY

- 6.1.1 The evaluation was undertaken according to a Written Scheme of Investigation (Hawkins 2013) which was approved in advance by Adam Single, Archaeological Advisor to the London Borough of Waltham Forest. The aim of the work was to define and characterise any archaeological deposits and features, in order to allow an assessment to be made of the heritage potential of the site, and the impact upon it from the proposed development.
- 6.1.2 Significant areas of contamination were identified by soil testing across the area of the site and significant measures were required to work safely in the area, as detailed in the Written Scheme of Investigation (Hawkins 2013).
- 6.1.3 Due to the presence of ground contaminants it was necessary to use a mobile decontamination unit and set up designated clean and dirty areas, with designated walkways for access to and from the work areas. All staff were required to use the P.P.E provided to ensure that investigations were undertaken safely.
- 6.1.4 The evaluation comprised five trenches (Figure 2), two within the footprint of the main development area and stepped to achieve a maximum depth of 3.6m (Trenches 3 and 4) and three of no more than 1.2m depth (Trenches 1, 2 and 5), located in areas of lesser impact from the proposed development. Due to the presence of onsite constraints including services the location of Trench 4 was adjusted somewhat to the north.
- 6.1.5 Trench 1 was aligned approximately east-west and measured 7m long by 1.8m wide, Trench 2 was aligned east-west and measured 5m long by 1.80m wide, Trench 3 was aligned east-west and measured 30m long by 1.8m at base, Trench 4 was aligned east-west and measured 20m long by 1.8m at base and Trench 5 was aligned northeast-southwest and measured 10m long by 1.8m wide.
- 6.1.6 The trenches were opened using a 360° mechanical excavator fitted with a toothless bucket under archaeological supervision in spits of no more than 100mm at a time, and the modern overburden and low grade archaeological horizons were removed until natural or archaeological horizons were encountered. The trenches were stepped at a depth of c.1.2m to allow for safe access to the excavation.
- 6.1.7 All trenches were cleaned by hand, recorded and photographed. Recording of the deposits was accomplished using the Single Context Recording Method on proforma context and planning sheets. Contexts were numbered and are shown in this report within squared brackets. Plans were drawn at a scale of 1:20 and sections at a scale of 1:10.
- 6.1.8 The alluvial sequence was recorded on-site by Dan Young of Quest. Two Temporary Bench Marks (TBM) were established on the site using GPS survey equipment. These had values of 10.94m OD and 10.48m OD.

7 ARCHAEOLOGICAL PHASE DISCUSSION

7.1 Phase 1 – Natural terrace gravel

- 7.1.1 The earliest deposits recorded during the evaluation were the natural sandy gravels, present in Trenches 3 and 4. In Trench 3 the natural sandy gravel [11], was recorded at a highest point of 8.21m OD at the eastern end of the trench and sloped down considerably to 7.26m OD at the western end. In Trench 4 the natural sandy gravel [13], was recorded at a consistent level of 7.90m OD throughout.
- 7.1.2 These deposits were consistent with the underlying drift geology, the natural terrace gravel of the Taplow Gravel Formation, as illustrated by the British Geological Survey map for the area (Sheet 256 North London).

7.2 Phase 2 – Natural alluvium

- 7.2.1 The earliest deposit recorded in Trench 2 was a layer of alluvial silt [2]. This layer was recorded at c. 9.34m OD and was at least 0.44m thick, continuing deeper beyond the excavated limit of the trench. This deposit represented the upper level of the alluvial sequence of the site.
- 7.2.2 Sealing the natural terrace gravel in Trench 3 was an extensive sequence of alluvial deposits. This sequence of alluvial clays, silts and sands contexts [8], [9] and [10], were recorded at a highest level of c. 9.70m OD. The overall thickness of this sequence varied between 1.50m in the eastern end of trench to 2.25m thick in the western end. The variation in thickness was due to the natural topography sloping down from east to west towards the River Lea, as represented by the level of the natural terrace gravels. This sequence of alluvial deposits was completely sterile and devoid of anthropogenic artefacts or organic material. A full lithostratigraphic description of these alluvial deposits can be found in Appendix 6.
- 7.2.3 Sealing the natural terrace gravel in Trench 4 was another extensive sequence of alluvial deposits. This sequence of alluvial clays, silts and sands, contexts [3], [4], [5] and [6], were recorded at a highest level of c. 9.35m OD. The alluvial sequence had a consistent overall thickness of c. 1.50m throughout the trench. This sequence was of a similar nature to that which was recorded in Trench 3. Again this alluvial sequence was completely sterile being devoid of anthropogenic artefacts or organic material. A full lithostratigraphic description of this sequence can be found in Appendix 6.
- 7.2.4 The earliest deposit recorded in Trench 5 was a layer of alluvial silt [1]. This layer was recorded at c. 9.75m OD and was at least 0.60m thick, continuing deeper beyond the excavated limit of the trench. Much like the alluvial deposit recorded in Trench 2 this layer represents the upper level of the alluvial sequence of the site, a sequence which was fully recorded in deeper Trenches 3 and 4.

7.3 Phase 3 - Modern

- 7.3.1 The earliest feature recorded within Trench 1 of the evaluation was a modern concrete slab, located at c. 9.76m OD. This was overlain by a 1.80m thick layer of 21st century detritus the top of which was recorded at 11.56m OD, the modern ground level.
- 7.3.2 Sealing alluvial deposit [2] in Trench 2 was a sequence of modern made ground, which had a maximum thickness of 0.94m. This modern levelling was recorded at c. 10.15m OD and represented the modern ground level.
- 7.3.3 Sealing the extensive alluvial sequence in Trench 3 was a sequence of modern levelling layers capped by concrete. These deposits had an overall thickness of c. 0.80m being located at c. 10.50m OD, the modern ground level.
- 7.3.4 Sealing the extensive alluvial sequence in Trench 4 was a sequence of modern levelling layers capped by concrete. These deposits had an overall thickness of c. 1m being located at c. 10.35m OD, the modern ground level.
- 7.3.5 Sealing alluvial deposit [1] in Trench 5 was a sequence of modern made ground, which had a maximum thickness of 0.60m. This modern levelling was recorded at c. 10.34m OD and

represented the modern ground level.

8 CONCLUSIONS

- 8.1 The archaeological evaluation recorded untruncated natural sandy gravels within evaluation trenches 3 and 4. These deposits were consistent with the known underlying geology across the site, natural sand and gravel of the Taplow Gravel Formation, as described by the British Geological Survey and by the archaeological watching brief already undertaken on the site (Pre-Construct Archaeology 2006). The evaluation indicated that the natural topography of the terrace gravels sloped from a high point in the northeastern corner of the site, the eastern end of Trench 3 at c. 8.21m OD, down sharply to c. 7.26m OD at the western end of Trench 3. The terrace gravel also appeared to slope down to the south being located consistently at c. 7.90m OD throughout Trench 4.
- 8.2 Sealing the natural terrace sands and gravels in evaluation trenches 3 and 4, was an extensive sequence of naturally deposited alluvium. This alluvium consisted of a sequence of alluvial silts, clays and sands which were between 1.50m and 2.25m thick across the site. This is again consistent with the results of the archaeological watching brief undertaken in 2006 (Pre-Construct Archaeology 2006). Further alluvial deposits were recorded within two of the shallower evaluation trenches 2 and 5, confirming the presence of alluvial deposits across the entire area of the site. These alluvial deposits were sterile and homogenous and contained no anthropogenic artefacts nor did they contain any organic content which could have provided key palaeoenvironmental information. These extensive sequences of alluvial deposits therefore can only provide limited information but do add to the corpus of knowledge regarding the alluvial sequence of the Lea valley particularly pertaining to any deposit modelling across the valley and its extended floodplain.
- 8.3 No archaeological features or artefacts of any period were encountered during the archaeological evaluation. The intact nature of the extensive sequence of alluvial deposits would have meant that any potential underlying archaeological features would have survived, cutting into the natural gravel. However no features were encountered within Trenches 3 and 4 which exposed the natural gravel.
- 8.4 Sealing the alluvial deposits in Trenches 2 to 5 were modern levelling deposits. These deposits most likely relate to the coming of the railway in the late 19th century or the site being used as a goods yard for the railway from the early 20th century. The presence of these modern levelling deposits directly sealing the alluvial sequences coupled with the lack of any ploughsoil or other such deposit suggests that the area of the site saw horizontal truncation into the alluvial deposits. This stripping undoubtedly occurred in the late 19th and early 20th century relating to the railway directly north and the site being used as a goods yard as already stated.
- 8.5 Evaluation Trench 1 encountered only modern deposits down to 1.80m below ground level where a concrete slab was located. The presence of these extensive modern deposits is related to this trench being located on an artificial bank most likely relating to the railway in close proximity to the north.
- 8.6 The completed archive will be deposited with LAARC under site code GDY 13. The archive consists of:
- Context sheets 13
 - Plans @ 1:20 1 (1 sheet)
 - Sections @ 1:10 6 (47 sheets)
 - Photographs 35 images
- 8.7 This evaluation and report comply with the prevailing planning policies. The proposed development will not impact on any significant archaeological resources.

9 BIBLIOGRAPHY

Printed Sources

Hawkins, H. 2012. *Land at Former British Rail Goods Yard/Proposed Willowfield School, Blackhorse Road, Walthamstow, London Borough of Waltham Forest, E17 6NQ, Written Scheme of Investigation for an Archaeological Evaluation*. PCA Unpublished Report.

Greater London Archaeological Advisory Service, 2009 *Archaeological Guidance Papers 3: Standards and Practices in Archaeological Fieldwork in London*.

Miles, A. 2004. *An Archaeological Desk-Based Assessment of the British Rail Goods Yard, 213-215 Blackhorse Road, Walthamstow, E17*. Museum of London Archaeology Service, unpublished report

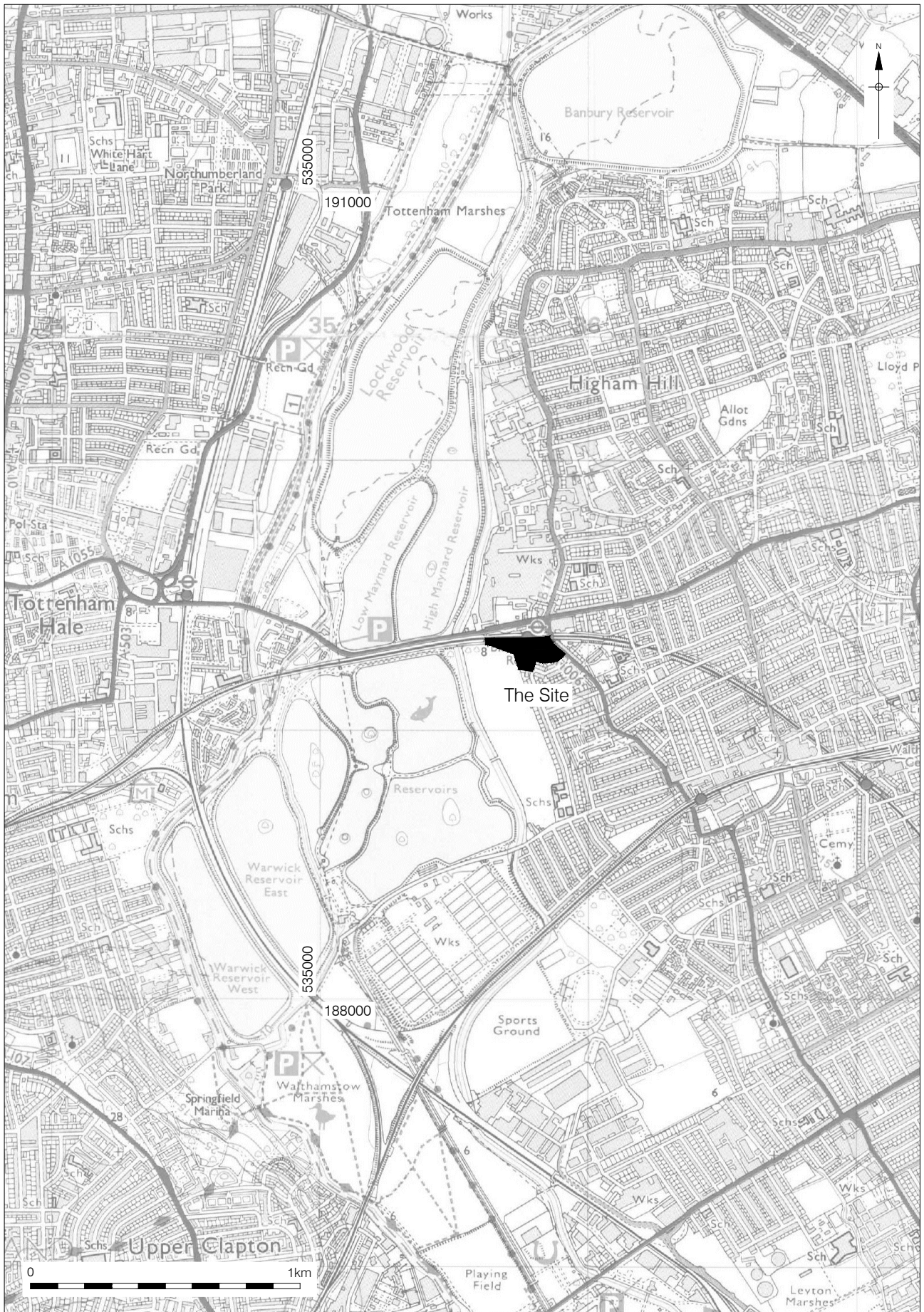
Pre-Construct Archaeology Ltd, 2006. *An Archaeological Watching Brief at the British Rail Goods Yard, 213-215 Blackhorse Road, Walthamstow, London Borough of Waltham Forest*. Pre-Construct Archaeology Ltd, unpublished report

Cartographic sources

British Geological Survey of Great Britain, Sheet 256 North London

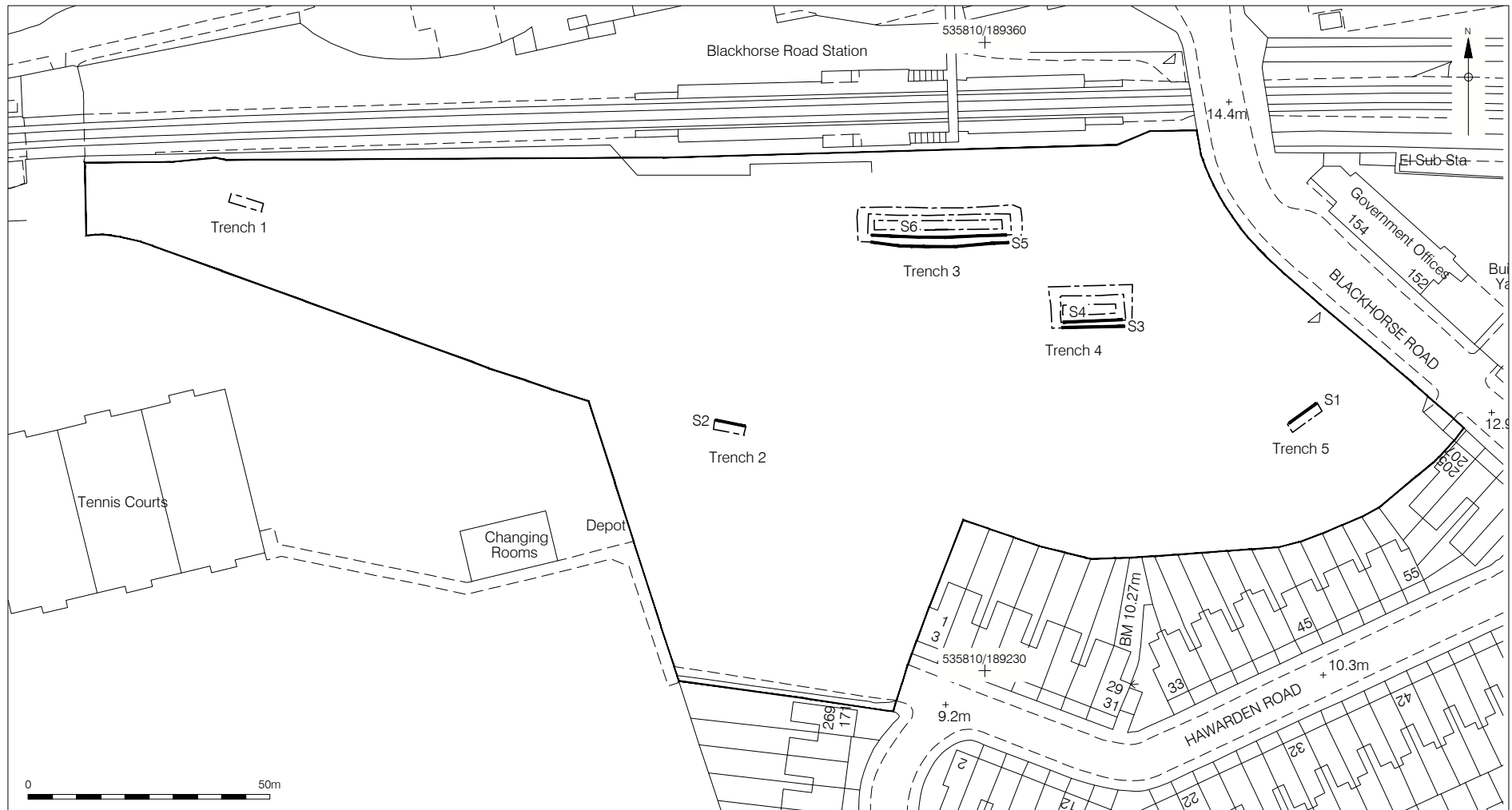
10 ACKNOWLEDGEMENTS

- 10.1 Pre-Construct Archaeology would like to thank Andrew Moody of Bouygues (UK) Limited for commissioning and funding this investigation.
- 10.2 Pre-Construct Archaeology would like to thank Adam Single of English Heritage for monitoring the work on behalf of the London Borough of Waltham Forest.
- 10.3 The author would like to thank Joe Brooks and Ian Cipin for their work on site, and Dan Young of Quest for the recording of the geoarchaeology. Thanks are given to Richard Archer for the surveying and Jennifer Simonson for the illustrations.
- 10.4 Special thanks are given to Helen Hawkins for her project management and the editing of this report.



© Crown copyright 2005. All rights reserved. License number 36110309
 © Pre-Construct Archaeology Ltd 2013
 29/04/13 JS

Figure 1
 Site Location
 1:20,000 at A4

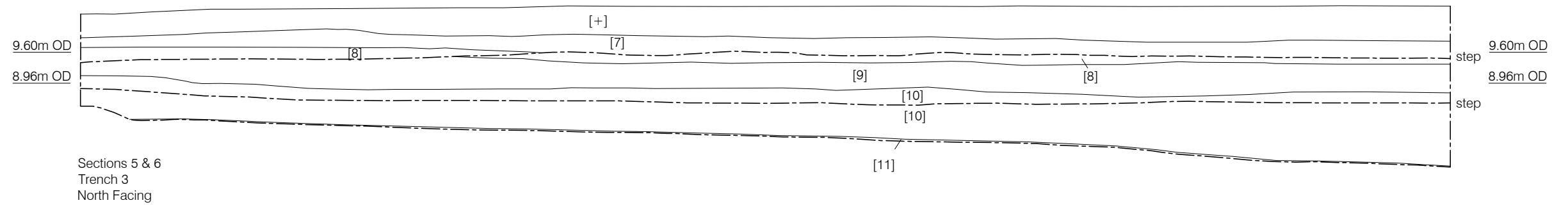
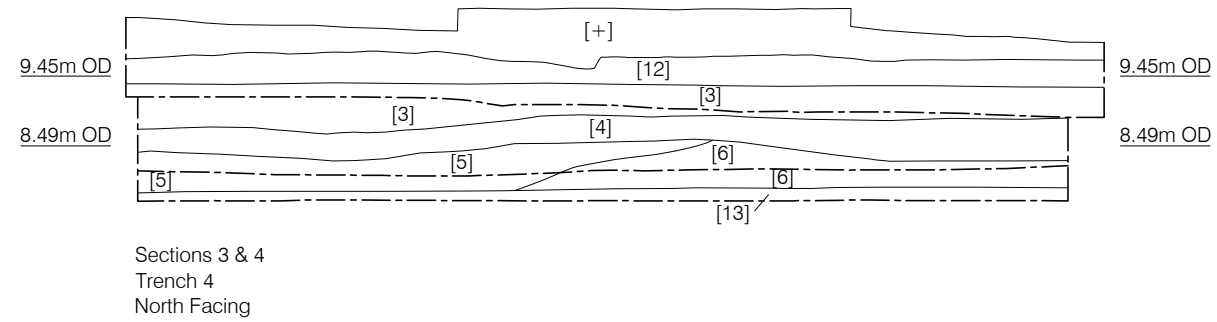
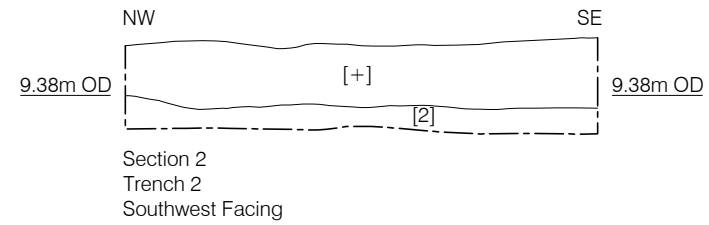
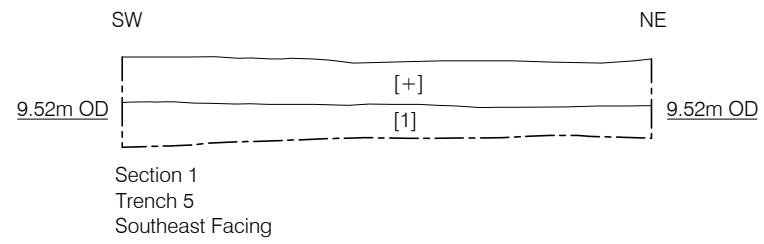


© Crown copyright 2013. All rights reserved. License number PMP36110309

© Pre-Construct Archaeology Ltd 2013

29/04/13 JS

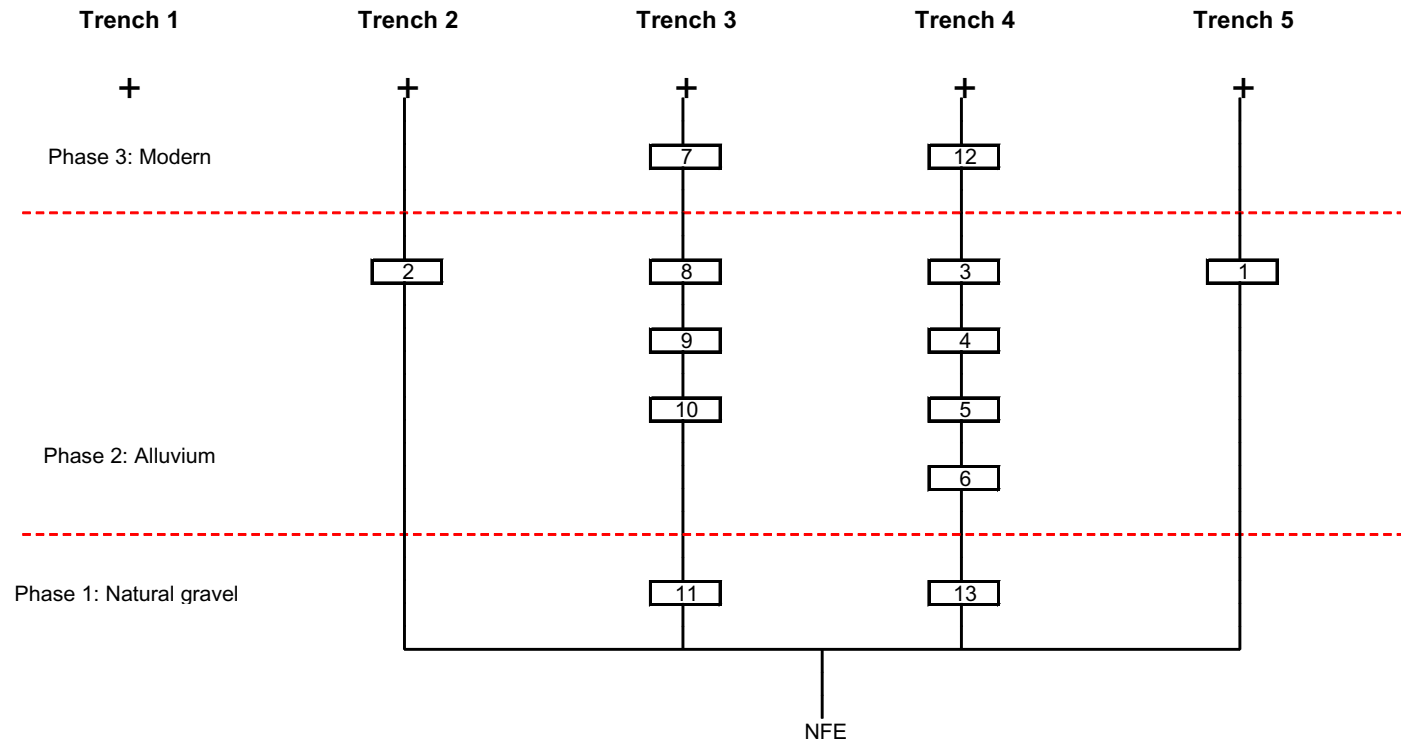
Figure 2
Trench Location
1:1,250 at A4



APPENDIX 1: CONTEXT INDEX

Context No.	Type	Trench No.	Phase	Section	Description	Highest Level	Lowest level
1	Layer	5	2	1	Alluvial silt	9.75m OD	-
2	Layer	2	2	2	Alluvial silt	9.38m OD	-
3	Layer	4	2	3	Alluvial silt	9.35m OD	9.30m OD
4	Layer	4	2	4	Alluvial sand	8.89m OD	8.74m OD
5	Layer	4	2	4	Alluvial clay	8.56m OD	8.41m OD
6	Layer	4	2	4	Alluvial sandy gravel	8.56m OD	8.29m OD
7	Layer	3	3	5	19th/20th century made ground	9.90m OD	9.84m OD
8	Layer	3	2	5, 6	Alluvial silt	9.70m OD	9.50m OD
9	Layer	3	2	6	Alluvial clay silt	9.46m OD	9.36m OD
10	Layer	3	2	6	Alluvial silt	9.11m OD	8.76m OD
11	Layer	3	1	6	Natural terrace sandy gravel	8.21m OD	7.26m OD
12	Layer	4	3	3	19th/20th century made ground	9.79m OD	-
13	Layer	4	1	4	Natural terrace sandy gravel	7.94m OD	7.88m OD

APPENDIX 2: SITE MATRIX



APPENDIX 3: OASIS REPORT FORM

OASIS ID: preconst1-148868

Project details

Project name An Archaeological Evaluation at the Former British Rail Goods Yard, Walthamstow, London Borough of Waltham Forest

Short description of the project An Archaeological Evaluation of land at the Former British Rail Goods Yard, Blackhorse Road, Walthamstow, London Borough of Waltham Forest. Five evaluation trenches recorded natural terrace gravels sealed by an extensive sequence of alluvial silts, clays and sands. These were sealed by 19th/20th century levelling deposits

Project dates Start: 11-04-2013 End: 19-04-2013

Previous/future work Yes / Not known

Any associated project reference codes GDY 13 - Sitecode

Type of project Field evaluation

Site status Local Authority Designated Archaeological Area

Current Land use Transport and Utilities 2 - Other transport infrastructure

Monument type NONE None

Significant Finds NONE None

Methods & techniques & "Targeted Trenches"

Development type Large/ medium scale extensions to existing structures (e.g. church, school, hospitals, law courts, etc.)

Prompt National Planning Policy Framework - NPPF

Position in the planning process Pre-application

Project location

Country England

Site location GREATER LONDON WALTHAM FOREST WALTHAMSTOW Former British Rail Goods Yard, Blackhorse Road, Walthamstow

Postcode E17 6NQ

Study area 23000.00 Square metres

Site coordinates TQ 3587 8929 51 0 51 35 08 N 000 02 19 W Point

Height OD / Depth Min: 7.00m Max: 8.00m

Project creators

Name of Pre-Construct Archaeology Ltd.
Organisation

Project brief GLAAS
originator

Project design Helen Hawkins
originator

Project Helen Hawkins
director/manager

Project supervisor Neil Hawkins

Type of Local Authority
sponsor/funding
body

Name of Bouygues UK
sponsor/funding
body

Project archives

Physical Archive No
Exists?

Digital Archive LAARC
recipient

Digital Archive ID GDY13

Digital Contents "Stratigraphic","Survey"

Digital available Media "Database","Survey","Text"

Paper recipient Archive LAARC

Paper Archive ID GDY13

Paper Contents "none"

Paper available Media "Context sheet","Matrices","Photograph","Plan","Report","Section","Survey","Unpublished Text"

Project bibliography 1

Publication type Grey literature (unpublished document/manuscript)

Title An Archaeological Evaluation at land at Former British Rail Goods Yard, Blackhorse Road, Walthamstow, London Borough of Waltham Forest

Author(s)/Editor(s) Hawkins, N.

Date 2013

Issuer or publisher Pre-Construct Archaeology Ltd

Place of issue or publication London

APPENDIX 4: PLATES



Plate 1: Trench 1 looking east illustrating modern landfill overlying concrete.



Plate 2: Trench 2 looking west.



Plate 3: Trench 3, looking west



Plate 4: Trench 4 looking southwest showing Sections 3 and 4



Plate 5: Trench 5 looking northeast.

APPENDIX 6: QUEST REPORT

BRITISH RAIL GOODS YARD, 213-215 BLACKHORSE ROAD, WALTHAMSTOW, LONDON BOROUGH OF WALTHAM FOREST (SITE CODE: GYW06): GEOARCHAEOLOGICAL FIELDWORK REPORT

D.S. Young

Quaternary Scientific (QUEST), School of Human and Environmental Sciences, University of Reading, Whiteknights, PO Box 227, Reading, RG6 6AB, UK

INTRODUCTION

This report summarises the findings arising out of the geoarchaeological fieldwork undertaken by Quaternary Scientific (University of Reading) in connection with the proposed development at the British Rail Goods Yard, 213-215 Blackhorse Road, Walthamstow, London Borough of Waltham Forest (National Grid Reference: TQ 35777 89303; Site Code: GYW06; Figure 1). Previous investigations at the site by Pre-Construct Archaeology Limited consisted of an archaeological watching brief of geotechnical boreholes, trial pits (both machine and hand-excavated) and window samples, undertaken between 30th May and 6th June 2006 (Sargent, 2006). Seven cable percussion boreholes and six trial pits were put down across the site to depths between 4 and 35m. In addition, six window samples and three hand-dug trial pits were excavated to depths of 1.20 to 5m. During subsequent archaeological investigations at the site by Pre-Construct Archaeology Limited five trenches were excavated in April 2013. Two of these trenches (Trenches 3 and 4) recorded the full Holocene sequence at the site, terminating in Thames terrace gravels; the remaining three trenches recorded only the interface between the Made Ground and Alluvium.

The site occupies a triangular area of approximately 280m from east to west and approximately 85m from north to south. The site is bounded to the north by Blackhorse Road station and to the south by the rear of the properties in Hawarden Road. The site is in the lower valley of the River Lea, to the east of the modern river where it is divided in to the channels of the Lee Navigation, Lee flood relief and River Lea. The British Geological Survey (1:50,000 Sheet 257 Romford 1996) shows the site underlain by Taplow Gravel Formation sand and gravel (equivalent to the Leytonstone Gravel of the Lea Valley (Gibbard, 1994)), resting on London Clay bedrock.

The site is located within Landscape Zones 3.5 and 3.13 of the Lea Valley Mapping Project (Corcoran *et al.*, 2011). The deposits within Zone 3.5 are described as 'thick clays, sands and

organic sediments... likely to represent active and abandoned channels'. In fact, the existing records from the site are more consistent with Corcoran *et al.*'s (2011) zone 3.13, where the Leytonstone Gravel is overlain by sandy deposits that 'represent watercourses flowing across the Pleistocene floodplain', in turn overlain by clayey deposits which have most likely been 'transported downslope from the higher river terraces to the west, during later stages of the Pleistocene'.

The aim of the geoarchaeological investigations at the Blackhorse Road site was to clarify the nature of the sub-surface stratigraphy, and evaluate the potential of the sedimentary sequences for reconstructing the environmental history of the site and its environs. In order to achieve this aim, a visit was made to the site in order to record the sedimentary sequences within Trenches 3 and 4.

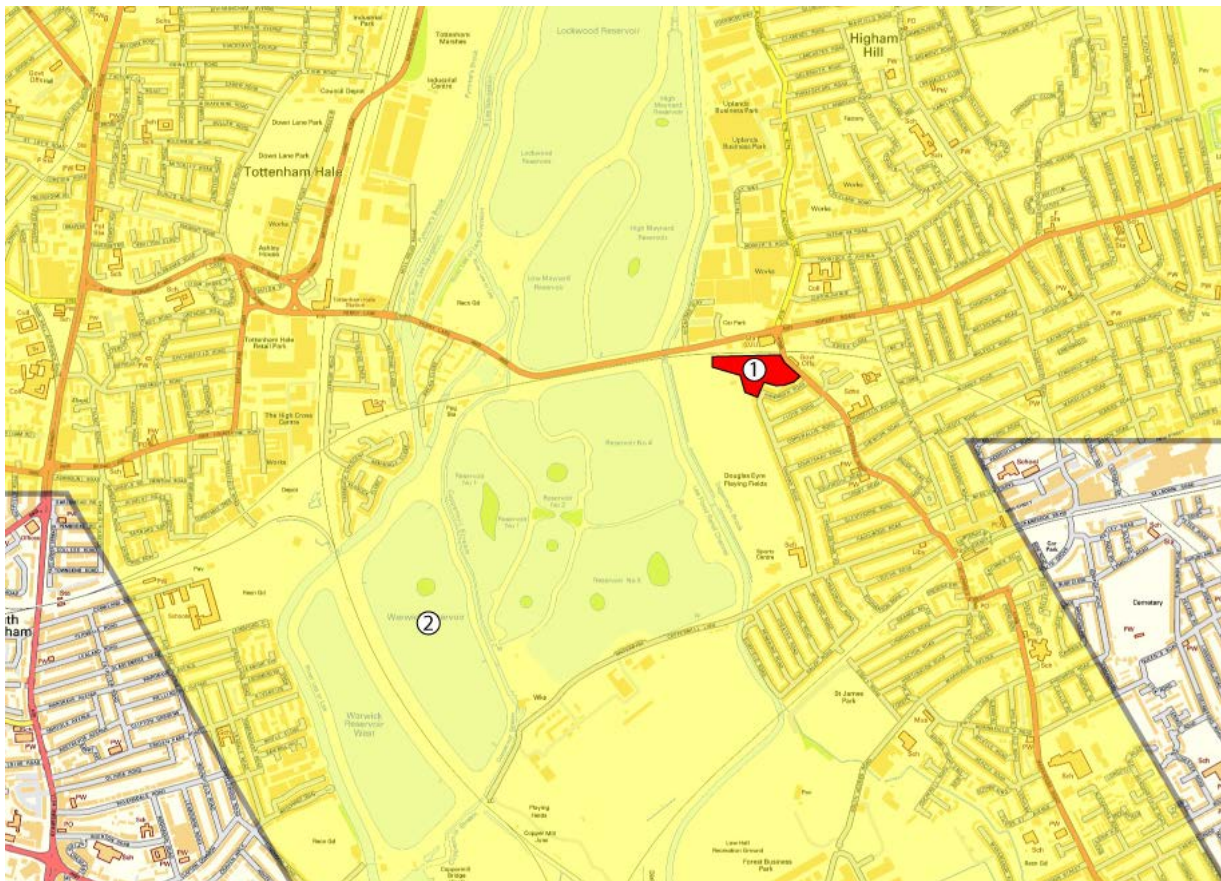


Figure 1: Location of (1) the British Rail Goods Yard, 213-215 Blackhorse Road and (2) area of the Lower Lea Valley Mapping Project (Corcoran *et al.*, 2011). Contains Ordnance Survey data © Crown copyright and database right [2012]

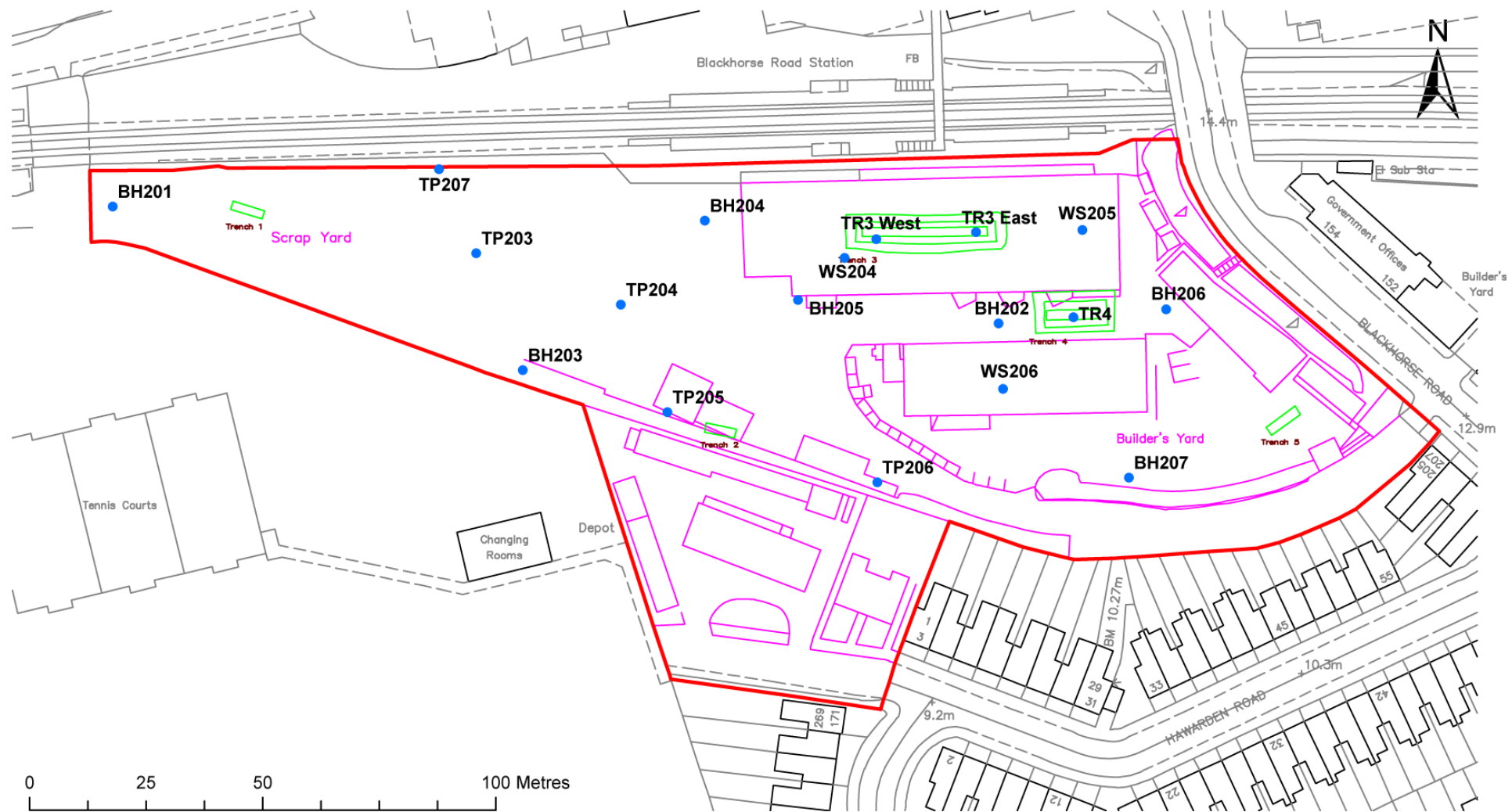


Figure 2: Location of borehole, test pit and trench records used in the deposit model. The British Rail Goods Yard, 213-215 Blackhorse Road, Walthamstow, London Borough of Waltham Forest (Site Code: GYW06).

METHODS

Field investigations

Five archaeological trenches were observed at the site in April 2013. Three of the trenches recorded only the transition between the Made Ground and Alluvium, whilst Trenches 3 and 4 were excavated to the surface of the Terrace gravel. The lithostratigraphy of Trenches 3 and 4 was described in the field using standard procedures for recording unconsolidated sediment and organic sediments, noting the physical properties (colour), composition (gravel, sand, clay, silt and organic matter) and inclusions (e.g. artefacts) (Tröels-Smith, 1955). The procedure involved: (1) cleaning the samples with a spatula or scalpel blade and distilled water to remove surface contaminants; (2) recording the physical properties, most notably colour using a Munsell Soil Colour Chart; (3) recording the composition; gravel (*Grana glareosa*; Gg), fine sand (*Grana arenosa*; Ga), silt (*Argilla granosa*; Ag) and clay (*Argilla steatoides*); (4) recording the degree of peat humification and (5) recording the unit boundaries e.g. sharp or diffuse. The results are displayed in Tables 1 to 3.

Deposit modelling

The following resources were used for the collection of stratigraphic information for the creation of the deposit model: (1) boreholes put down previously across the site by Pre-Construct Archaeology Ltd., and (2) stratigraphic records from the archaeological trenches observed by Quaternary Scientific. These records were individually scrutinised; those which did not penetrate beyond the surface of the Upper Alluvium or were considered unreliable were not included. This resulted in 18 sediment logs for the deposit modelling process (Table 1). With the exception of surface elevation, spatial data for the borehole, test pit and trench records was not available; these were therefore estimated using ArcView GIS mapping software (see Figure 2).

Sedimentary units from the boreholes were classified into the following groupings: (1) Taplow/Leytonstone Gravel; (2) Alluvium/Colluvium and (3) Made Ground. No distinction was made in the deposit model between the Alluvium and Colluvium at the site, as it was not possible to separate these horizons using the previous borehole and test pit records. The classified data for groups 1-3 were input into a database with the RockWorks 2006 geological utilities software. Models of surface height (using a nearest neighbour routine) were generated for the Gravel, Alluvium/Colluvium and Made Ground (Figures 3, 4 and 6). The thickness of the Alluvium/Colluvium and Made Ground was also modelled (also using a nearest neighbour routine) (Figures 5 and 7).

Because the boreholes are not uniformly distributed over the area of investigation, the

reliability of the models generated using RockWorks varies. In general, reliability improves from outlying areas where the models are largely supported by scattered archival records towards the core area of records. In addition, because of the 'smoothing' effect of the modelling procedure, the modelled levels of stratigraphic contacts may differ slightly from the levels recorded in borehole logs and section drawings. As a consequence of this, the modelling procedure has been manually adjusted so that only those areas for which sufficient stratigraphic data is present will be modelled; in order to achieve this, a maximum distance cut-off filter of 15% is applied to all deposit models.

Table 1: Borehole, test pit and trench records used for the creation of the British Rail Goods Yard, 213-215 Blackhorse Road deposit model

Borehole number	Easting	Northing	Surface elevation (m OD)
BH201	535626.00	189328.00	10.14
BH202	535816.00	189303.00	10.31
BH203	535714.00	189293.00	10.41
BH204	535753.00	189325.00	10.29
BH205	535773.00	189308.00	10.26
BH206	535852.00	189306.00	10.21
BH207	535844.00	189270.00	10.54
TP203	535704.00	189318.00	11.00
TP204	535735.00	189307.00	10.65
TP205	535745.00	189284.00	10.44
TP206	535790.00	189269.00	10.37
TP207	535696.00	189336.00	10.42
Trench 3 East	535811.20	189322.50	10.50
Trench 3 West	535789.80	189321.00	10.50
Trench 4	535832.10	189304.30	10.35
WS204	535783.00	189317.00	10.34
WS205	535834.00	189323.00	10.22
WS206	535817.00	189289.00	10.49

RESULTS AND INTERPRETATION OF THE MONITORING AND DEPOSIT MODELLING

The results of the deposit modelling are displayed in Figures 3 to 7. The results indicate that a sufficient number and spread of boreholes, test pits and trenches have been put down across the site to permit modelling across the entire area of the site, with the exception of the southern spur of the site south of test pits TP205 and TP206.

The lowermost unit recorded are the sands and gravels of the Leytonstone Gravel (Figure 3). These sediments were deposited during the Wolstonian Glacial period, within a high energy braided river system. The surface of this unit slopes downwards towards the west of the site, from a maximum of 8.64m OD in borehole BH207 to 6.14m OD in borehole BH201. In Trench 4 the Gravel surface lies at 7.85m OD, whilst in Trench 3 the surface falls sharply from 8.30m OD at the eastern end to 7.26m OD at its western end. This slope in the Gravel surface probably reflects the natural slope of the terrace towards the main axis of the former channel, which at this location is orientated broadly north-south.

In Corcoran *et al.*'s (2011) landscape zone 3.13, and as stated above, the Leytonstone Gravel is overlain by sandy deposits that 'represent watercourses flowing across the Pleistocene floodplain', in turn overlain by clayey deposits which have most likely been 'transported downslope from the higher river terraces to the west, during later stages of the Pleistocene'. It is not possible to identify distinct horizons of Alluvium and Colluvium in the previous records from the site, which may be a consequence of the level of recorded detail in these records. In the records from Trenches 3 and 4 however (Tables 2 to 4), the Gravel surface is overlain by a well sorted, predominantly sandy or coarse silty clay horizon between 1.0 and 1.5m thick and recorded to a level of between 8.70 and 8.85m OD. This horizon is interpreted as Alluvium, which may correlate to the sandy deposits identified by Corcoran *et al.* (2011) overlying the Leytonstone Gravel within zone 3.13, and representing deposition in a low to moderate energy fluvial environment during the Pleistocene.

In Trenches 3 and 4 this horizon is overlain by a unit of poorly sorted, generally sandy clayey silt containing occasional angular gravel clasts. This horizon is interpreted as Colluvium, again identified within Corcoran *et al.*'s (2011) landscape zone 3.13 and representing slope deposits derived from higher river terraces to the east during the later stages of the Pleistocene. An area of discoloured sediment measuring approximately 2m wide by 1m deep was identified within the Colluvium at the western end of Trench 3. The sides of this feature were vertical, and very sharply defined; however, there was no archaeological evidence to suggest that it was a man-made feature. Within the feature itself the sediment was heavily oxidised, whilst little evidence was present for oxidisation both immediately adjacent to the

feature, and elsewhere at equivalent depths in Trench 3. There was no apparent difference between the composition of the sediment within and outside of the feature, and there was no evidence that any organic remains had survived within it. It therefore seems likely that the discolouration (oxidation) may have affected sediment around the primary cause of the oxidation, the remains of which are no longer present. Possible primary causes of this oxidation could be (1) an infilled or collapsed animal burrow, such as a badger sett; or (2) an object buried by natural processes within the Colluvium, such as a log or large mammal. Given the nature of the Made Ground and the various phases of past development at the site, it is also possible that the oxidisation is a feature of more recent disturbance of the overlying sediment at this location. However, it is unlikely that any further examination of the feature will identify the cause of the processes behind its formation.

The combined Alluvium and Colluvium across the site is generally thicker where the Gravel surface is deeper, increasing in thickness from between 1.0 and 2.0m in the eastern part of the site to between 2.0 and 3.5m in the west (Figure 5). This horizon is overlain by Made Ground across the site at a level of between ca. 9.0 and 10.0m OD (Figure 4). The Made Ground caps the site to a level of between 10.0 and 11.0m OD (Figure 6), and is between ca. 0.4 and 2.0m thick (Figure 7).

Table 2: Lithostratigraphic description of Trench 3, Section 1 (East), British Rail Goods Yard, 213-215 Blackhorse Road, Walthamstow, London Borough of Waltham Forest (Site Code: GYW06)

Depth (m bgs)	Depth (m OD)	Description
0.00 to 0.80	10.50 to 9.70	Made Ground
0.80 to 1.30	9.70 to 9.20	As2 Ag1 Ga1; orangey brown silty fine sandy clay. Sharp contact in to:
1.30 to 1.70	9.20 to 8.80	Ag2 Ga1 Gg1; orangey brown sandy gravelly silt. Clasts angular to rounded. Diffuse contact in to:
1.70 to 2.20	8.80 to 8.30	Ga2 Ag1 As1 Gg+; dark orangey brown silty clayey very fine sand with occasional gravel clasts. Sharp contact in to:
2.20+	8.30>	Gg3 Ga1; sandy gravel. Flint clasts 10-50mm diameter; sub-angular to rounded.

Table 3: Lithostratigraphic description of Trench 3, Section 2 (West), British Rail Goods Yard, 213-215 Blackhorse Road, Walthamstow, London Borough of Waltham Forest (Site Code: GYW06)

Depth (m bgs)	Depth (m OD)	Description
0.00 to 1.00	10.50 to 9.50	Made Ground
1.00 to 1.80	9.50 to 8.70	Ag2 As1 Ga1; greyey brown clayey fine sandy silt. Diffuse contact in to:
1.80 to 3.24	8.70 to 7.26	Ag3 As1 Gg+; greyey brown clayey coarse silt with occasional gravel clasts.
3.24+	7.26>	Gg3 Ga1; sandy gravel. Flint clasts 10-50mm

		diameter, sub-angular to rounded.
--	--	-----------------------------------

Table 4: Lithostratigraphic description of Trench 4, British Rail Goods Yard, 213-215 Blackhorse Road, Walthamstow, London Borough of Waltham Forest (Site Code: GYW06)

Depth (m bgs)	Depth (m OD)	Description
0.00 to 1.00	10.35 to 9.35	Made Ground
1.00 to 1.50	9.35 to 8.85	Ag2 As1 Ga1 Gg+; orangey brown clayey sandy silt with occasional gravel clasts. Diffuse contact in to:
1.50 to 2.50	8.85 to 7.85	Ga3 Ag1; orangey brown silty sand. Sharp contact in to:
2.50+	7.85>	Gg3 Ga1; sandy gravel. Flint clasts 20-60mm diameter; sub-angular to rounded.

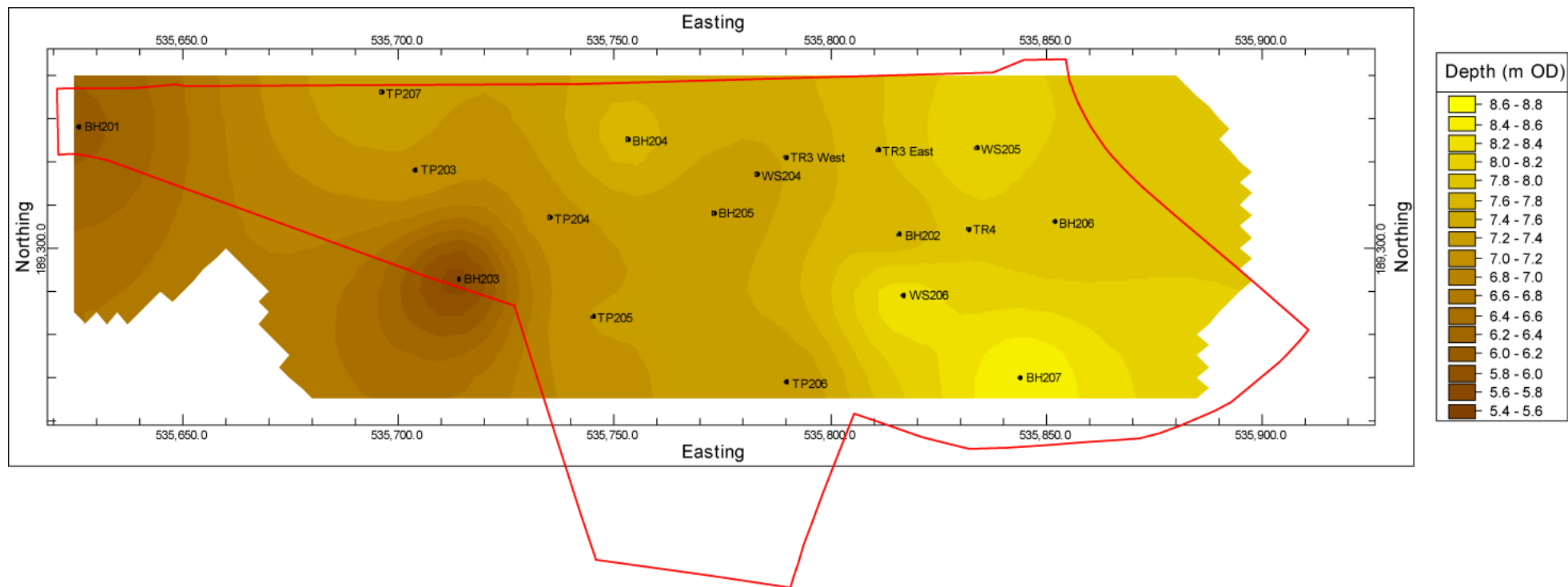


Figure 3: Modelled surface of the Leytonstone Gravel (contour heights in metres OD).

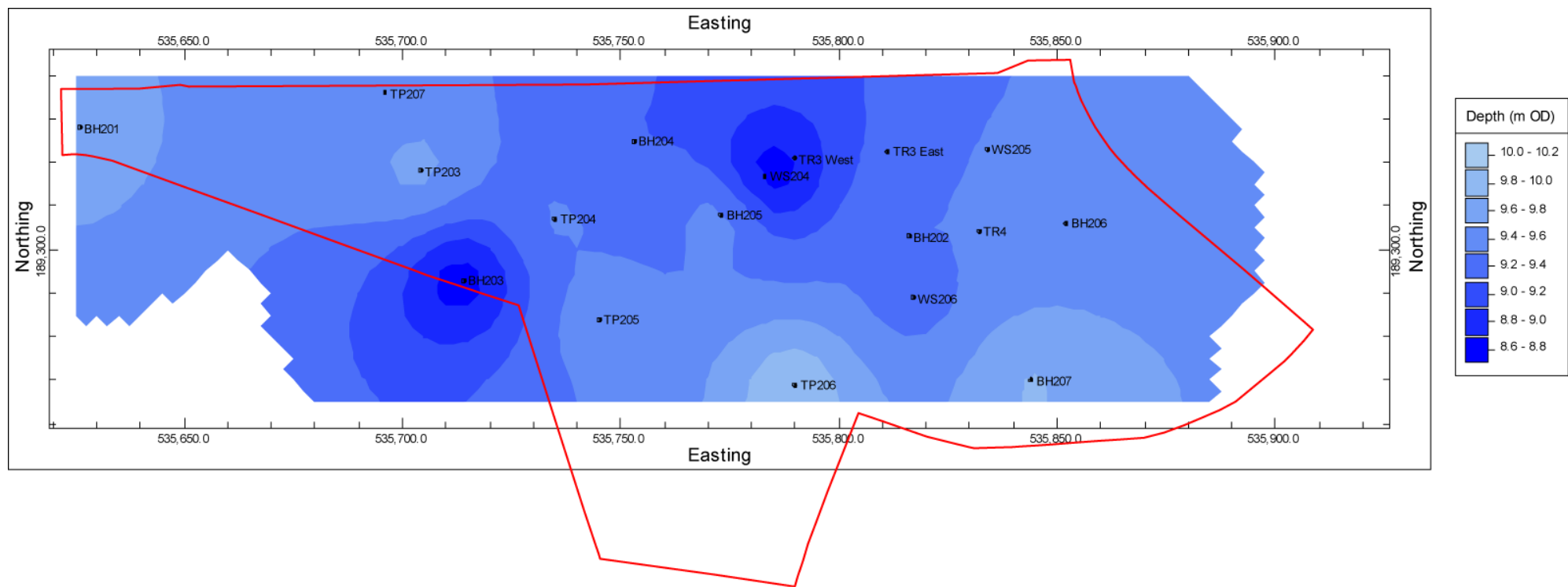


Figure 4: Modelled surface of the Alluvium/Colluvium (contour heights in metres OD)

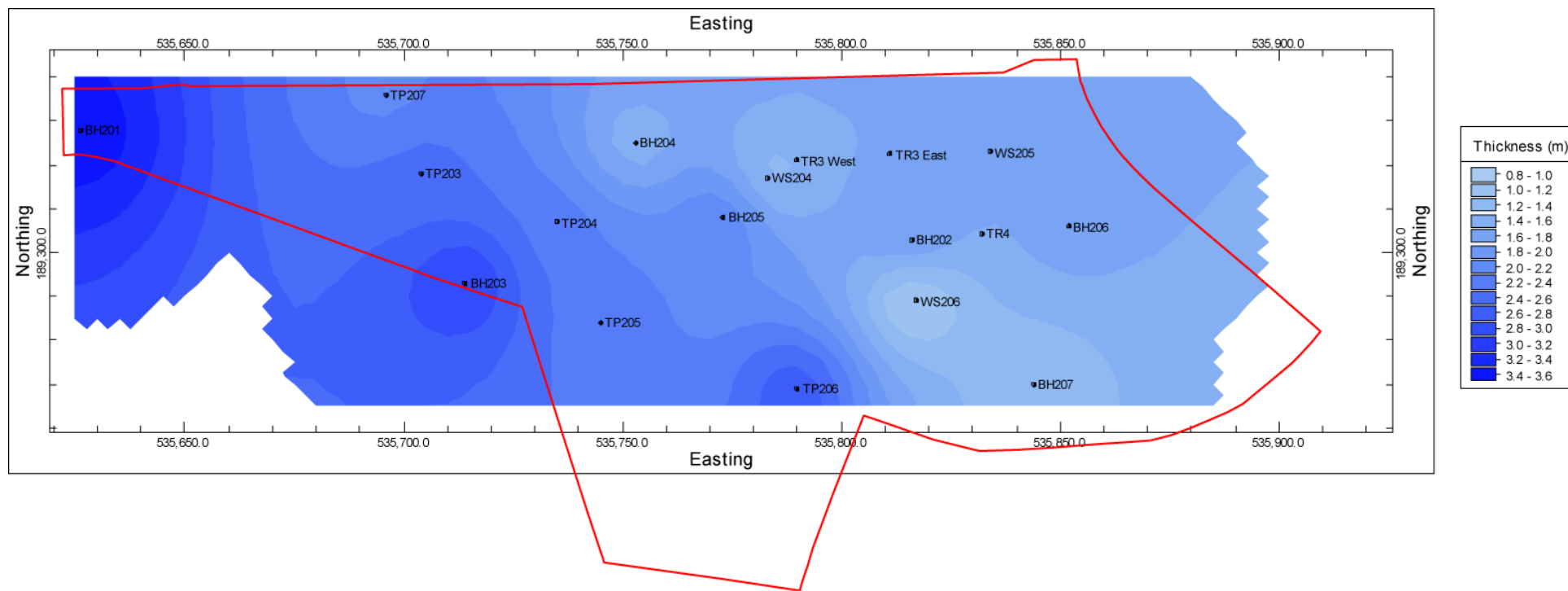


Figure 5: Modelled thickness of the Alluvium/Colluvium (contour heights in metres OD)

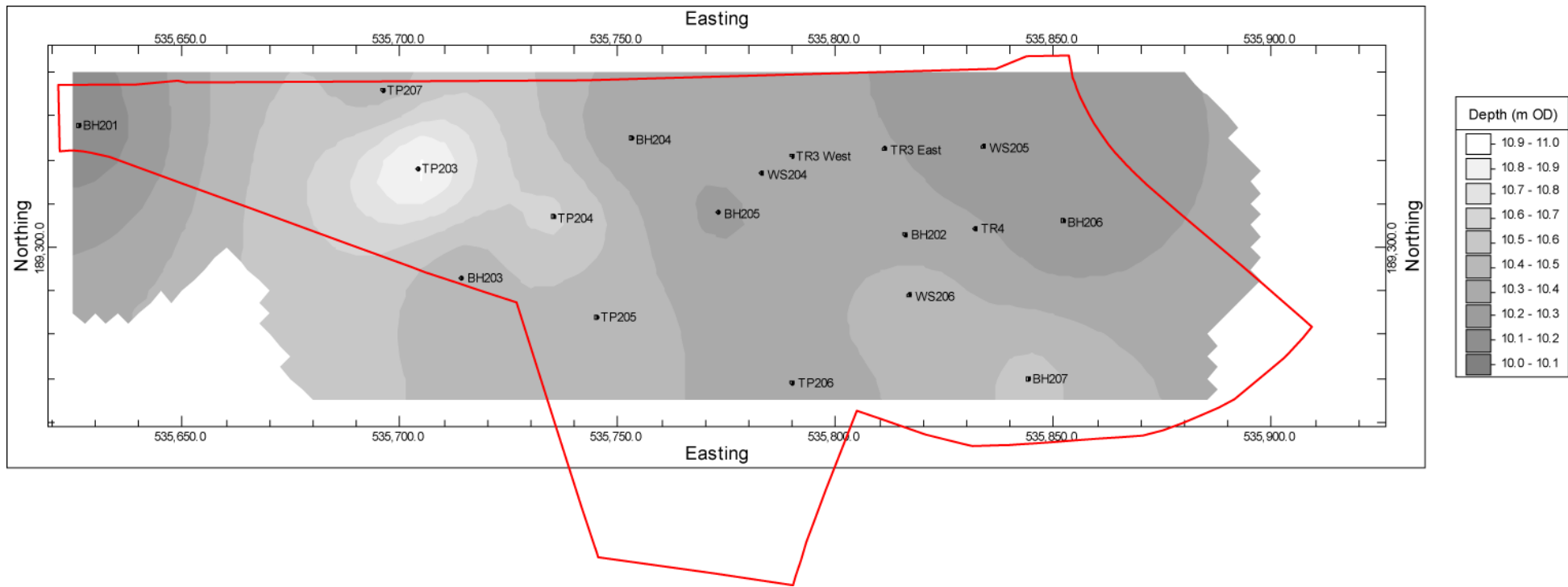


Figure 6: Modelled surface of the Made Ground (contour heights in metres OD)

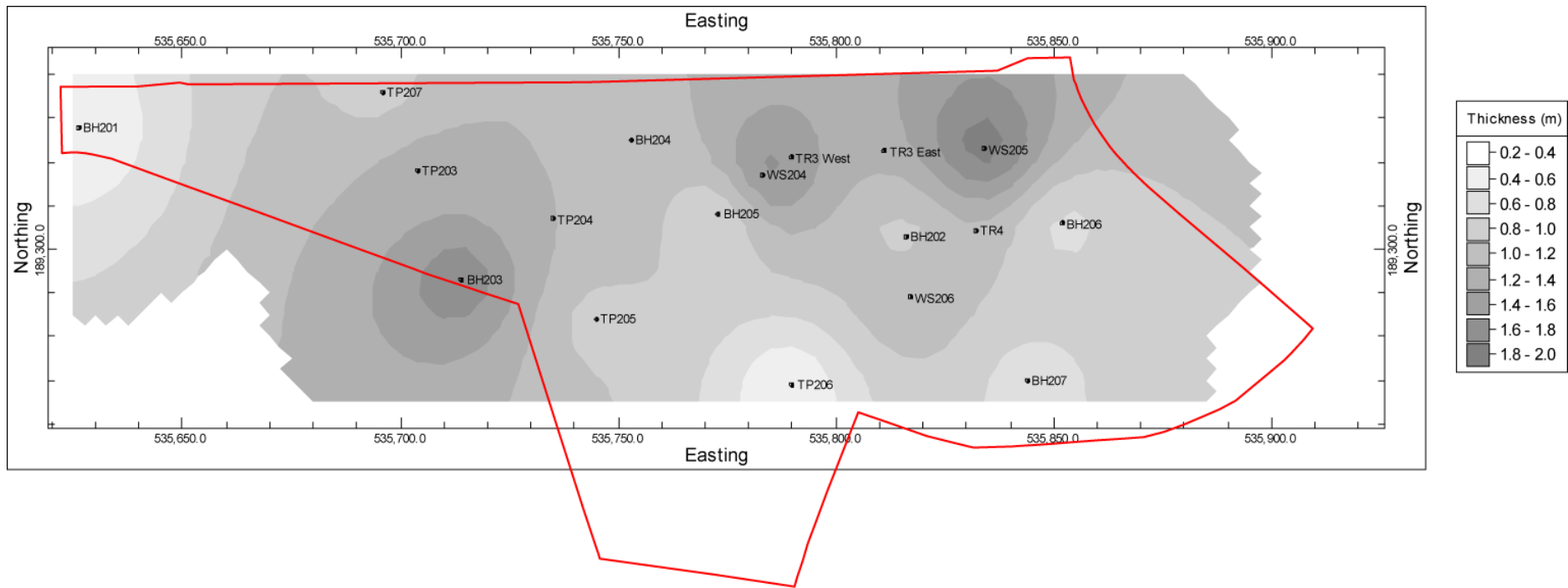


Figure 7: Modelled thickness of the Made Ground (metres)

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

The results of the geoarchaeological investigations have enhanced previous investigations at the Blackhorse Road site, and within the local area (Corcoran *et al.*, 2011). The Wolstonian Leytonstone Gravel terrace forms the platform upon which alluvial, and later colluvial sediments have accumulated.

The Gravel surface falls westwards from a maximum of *ca.* 8.5m OD in the eastern part of the site to 6.0m OD in the west. It was not possible to identify distinct horizons of Alluvium and Colluvium in the previous borehole and test pit records from the site; however, in Trenches 3 and 4 the Gravel surface was overlain by a horizon of sandy or coarse silty clay Alluvium between 1.0 and 1.5m thick, and recorded to a level of between 8.70 and 8.85m OD. This horizon is in turn overlain by silty Colluvium, present to a level of between *ca.* 9.0 and 10.0m OD and deposited during the later stages of the Pleistocene.

Corcoran *et al.* (2011) indicate that in zone 3.13 (the Landscape Zone the deposits at the Blackhorse Road site most closely resemble) there is potential for both in situ and redeposited Palaeolithic remains, particularly within the sandy alluvial deposits. However, the sediments at the Blackhorse Road site are consistent with the interpretation made by Corcoran *et al.* (2011) that environmental evidence is likely to be poorly preserved. The absence of any organic horizons at the site, and the coarse-grained nature of the Alluvium and Colluvium indicate that the sequences are unlikely to provide any evidence of environmental change or vegetation history through the sequence; further environmental archaeological or geoarchaeological investigations at the site are therefore not recommended.

REFERENCES

Corcoran, J., Halsey, C., Spurr, G., Burton, E. and Jamieson, D. (2011) *Mapping past landscapes in the lower Lea valley : A geoarchaeological study of the Quaternary sequence.* Museum of London Archaeology, MOLA Monograph 55.

Gibbard, P.L. (1994) *Pleistocene History of the Lower Thames Valley.* Cambridge University Press, Cambridge.

Sargent, A (2006) An Archaeological Watching Brief at the British Rail Goods Yard, 213-215 Blackhorse Road, Walthamstow, London Borough of Waltham Forest. *Pre-Construct Archaeology Limited Unpublished Report, June 2006.*

Tröels-Smith, J. (1955) Karakterisering af løse jordater (Characterisation of unconsolidated sediments), *Danm. Geol. Unders.*, **Ser IV 3**, 73.

**APPENDIX 6: WRITTEN SCHEME OF INVESTIGATION FOR AN
ARCHAEOLOGICAL EVALUATION AT THE FORMER BRITISH RAIL
GOODS YARD/PROPOSED WILLOWFIELD SCHOOL, BLACKHORSE
ROAD, WALTHAMSTOW E17 6NQ LONDON BOROUGH OF WALTHAM
FOREST**

**LAND AT FORMER BRITISH RAIL GOODS YARD/PROPOSED WILLOWFIELD
SCHOOL, BLACKHORSE ROAD, WALTHAMSTOW, LONDON BOROUGH OF
WALTHAM FOREST, E17 6NQ**

WRITTEN SCHEME OF INVESTIGATION FOR ARCHAEOLOGICAL EVALUATION

LOCAL PLANNING AUTHORITY: LONDON BOROUGH OF WALTHAM FOREST

PLANNING APPLICATION NUMBER: PRE-PLANNING

SITE CODE: GDY13

CENTRAL NGR: TQ 3587 8929

COMMISSIONING CLIENT: BOUYGUES (UK) LTD

**PREPARED BY: HELEN HAWKINS (MifA),
PRE-CONSTRUCT ARCHAEOLOGY LTD**

APRIL 2013

Version 1: Issued for approval

Contractor: Pre-Construct Archaeology Limited
Unit 54, Brockley Cross Business Centre
96 Endwell Road
Brockley
London
SE4 2PD
Tel: 020 7732 3925
Fax: 020 7733 7896
Email: hhawkins@pre-construct.com
Website: www.pre-construct.com

© Pre-Construct Archaeology Limited

April 2013

© The material contained herein is and remains the sole property of Pre-Construct Archaeology Limited and is not for publication to third parties without prior consent. Whilst every effort has been made to provide detailed and accurate information, Pre-Construct Archaeology Limited cannot be held responsible for errors or inaccuracies herein contained.

CONTENTS

1	INTRODUCTION	4
2	BACKGROUND	4
3	RESEARCH DESIGN	5
4	SITE METHODOLOGY	6
5	RECORDING SYSTEMS.....	7
6	TREATMENT OF FINDS AND SAMPLES	8
7	ARCHIVES AND REPORTS	10
8	SIZE AND STRUCTURE OF EXCAVATION TEAM.....	11
9	PROGRAMMING.....	11
10	BIBLIOGRAPHY	11
	APPENDIX 1: PCA H&S POLICY STATEMENT (2012)	12
	APPENDIX 2: PCA H&S SITE RULES (2013)	19
	APPENDIX 3: SITE SPECIFIC CONTAMINATION RISK ASSESSMENT	24
	APPENDIX 4: SITE RISK ASSESSMENT.....	27
	FIGURE 1: SITE LOCATION	39
	FIGURE 2: TRENCH LOCATION	40

STAFF REGISTER OF INSTRUCTION TO THE CONTENTS OF THIS DOCUMENT

I, as an employee or sub-contractor of Pre-Construct Archaeology Ltd, confirm that I have read this document, understand its contents and will abide by its instructions.

<i>Name</i>	<i>Signature</i>	<i>Date</i>

1 INTRODUCTION

- 1.1. Pre-Construct Archaeology Ltd has been commissioned by Bouygues (UK) Ltd to undertake an archaeological evaluation on land at the former British Rail Goods Yard/proposed Willowfield School, Blackhorse Road, Walthamstow, E17 6NQ, London Borough of Waltham Forest (Figure 1).
- 1.2. The proposed development will see the redevelopment of the site for the construction of Willowfield School, which will move from its present site to the north of Forest Road. Construction of a school on this site was originally proposed in 2009 and an archaeological condition was attached to the site for evaluation work. Based on this previous requirement, the Archaeological Advisor to the London Borough of Waltham Forest was consulted in February 2013 and it was confirmed that archaeological evaluation should be carried out on the site prior to redevelopment.
- 1.3. The site is located within a locally designated Archaeology Priority Area which covers much of the Lea Valley flood plain. A geo-archaeological watching brief carried out on the site in 2006 (Pre-Construct Archaeology Ltd 2006) confirmed that alluvial deposits and terrace gravels relating to the Lea Valley were present on the site under substantial amounts of made ground relating to the later use of the site.
- 1.4. This Written Scheme of Investigation forms a method statement for the archaeological evaluation work on the site.

2 BACKGROUND

- 2.1. The site is situated at the former British Rail Goods Yard, Blackhorse Road, Walthamstow, E17 6NQ, London Borough of Waltham Forest, centred on NGR TQ 3587 8929. The site is bounded to the north by the Gospel Oak-Barking railway line, to the east by Blackhorse Road, to the south by Hawarden Road and to the west by playing fields.

2.2. Geological Background

- 2.2.1. The British Geological Survey (Sheet 256 North London) shows the anticipated geological sequence on the site as Quaternary River Terrace Deposits (Sand and Gravel). In the west of the site, Alluvium is noted. The solid geology comprises Eocene Thames Group Clay Silt Sand and Gravel.
- 2.2.2. An archaeological watching brief of geotechnical boreholes, trial pits (both machine and hand-excavated) and window samples was carried out at the British Rail Goods Yard in 2006 (Pre-Construct Archaeology Ltd 2006). London clay 'bedrock' was recorded across the site, sealed by a deposit of Thames terrace gravels, also across the entire site. These deposits were both observed to rise toward the east of the site. They were sealed by a layer of alluvium, thus rendering likely the survival of any prehistoric features cut into the gravels. Overlying this, slight evidence for horticultural activity was found in the central portion of the site, and probably represents its use prior to the construction of a goods yard in the late 19th or earlier 20th century. This involved significant ground levelling, specifically truncation of alluvial deposits in the higher eastern half of the site. Varied light industrial usage throughout the 20th century had resulted in the accumulation of layers of made ground and the construction of warehouse structures on the eastern half of the site.

2.3. Brief for Evaluation Work

- 2.3.1. A brief for the evaluation work was issued by Adam Single, Archaeological Adviser to the London Borough of Waltham Forest in February 2013:

A Brief for an archaeological evaluation at the former Blackhorse Road Goods Yard aka Willow Field School, Waltham Forest

The site lies on gravel and alluvium deposits connected with the Lea Valley and its prehistoric and palaeo-environmental potential.

A previous PCA watching brief on geotechnical work has confirmed that truncation by C19 railway works will not have significantly affected potential.

Trench plan should be informed by the geotech deposit model and aim for 5% of the site area.

Evaluation trenching layout should provide a transect covering the east west axis of the site as well as appropriate coverage elsewhere.

Evaluation should include the pond, amphitheatre, sports pitches, parking, drainage etc should this be anticipated to penetrate modern made ground.

A geoarchaeological specialist visit should be included in the WSI with provision for test pitting (1 per trench) and sampling of the gravels and alluvium.

All work to be undertaken according to GLAAS Standards and Guidance.

2.4. Methodology

- 2.4.1. The evaluation will see the excavation of five trenches, two stepped and three of no more than 1.2m depth (Figure 2). The shallow trenches will measure 7m, 5m and 10m in length and 1.8m in width. The stepped trenches will measure 30m and 20m at base x 1.8m at base. Both will be stepped twice if necessary to reach the top of the gravel deposits. Each stepped trench will be stepped down at a gradient of 1:1 to safely allow archaeological access to a maximum depth of up to 3.6m. The trenches will be excavated to either the top of the first significant archaeological horizon or natural ground. It is intended to evaluate the sequence to the surface of the River Terrace Gravels (if present). Should the trenches require deeper excavation to evaluate the full profile of deposits, a series of deeper machine excavated sondages will be excavated along the length of the trenches in the presence of a geoarchaeologist.
- 2.4.2. The evaluation is designed to be the first stage of archaeological site investigation and may be followed by further archaeological investigation / mitigation if required by the Archaeology Advisor to the Local Planning Authority, Adam Single of English Heritage.
- 2.4.3. All works will be undertaken in accordance with the following documents:
- This Written Scheme of Investigation (pending approval from the Archaeology Advisor to the Local Planning Authority)
 - GLAAS Archaeological Guidance Papers: 3: *Standards and Practices in Archaeological Fieldwork In London* (GLAAS 2009)
 - *MoRPHE* (English Heritage, 2008).
- 2.4.4. Pre-Construct Archaeology Limited is a Registered Archaeological Organisation (number 23) with the Institute of Field Archaeologists and will operate within the Institute's 'Code of Practice'.
- 2.4.5. PCA has the following accreditations:
- ISO9001 registration
 - Construction Line registration
 - Achilles registration
 - CHAS registration

3 RESEARCH DESIGN

- 3.1. The evaluation will aim to address the following primary objectives:
- To determine the natural topography of the site.
 - To determine the geoarchaeological sequence at the site, and to record the alluvial/fluvial deposits associated with the River Lea.
 - To establish the presence or absence of prehistoric activity, whether settled occupation or artefact scatters at the top of the gravel.
 - To establish the nature, date and survival of activity relating to any archaeological periods at the site.
 - To establish the extent of all past post-depositional impacts on the archaeological resource.
-

4 SITE METHODOLOGY

4.1. General

- 4.1.1. Trench locations will be CAT scanned by a qualified Pre-Construct Archaeology Ltd operative prior to excavation. If services are identified, the trench will be relocated. A service plan has been provided by the client and was used to influence the locations of the trenches (Figure 2). A large water main runs to the east of Trench 1 and its exclusion zone has been taken into account in the siting of Trench 1.
- 4.1.2. The machining will be undertaken using a HYMAC-excavator and driver which will be provided by the client's demolition contractor. The mechanical excavator will use a toothless ditching bucket (1.8m wide) to remove modern overburden under the supervision of an archaeologist. Spoil will be mounded at least 3m from the edges of the trench.
- 4.1.3. Machine excavation will continue in spits of 100mm at a time until either significant archaeological strata are found or natural ground exposed. In Trenches 3 and 4 the trench edges will be stepped to allow safe archaeological access to depth. The stepping will be at a gradient of 1:1 and the steps may be excavated to a depth of up to 1.2m before an equivalent width step is left. The 1.2m dimension is a maximum and will be shortened if ground conditions necessitate it. The trenches will be stepped twice if necessary to reach the top of the natural sequence.
- 4.1.4. If at the maximum basal depth of the trench (3.6m) natural geology (terrace gravels or London Clay) has not yet been reached, the machine will be used to excavate deeper sondages in locations where no archaeological remains are threatened to allow the strata to be recorded. These sondages will be recorded from ground level by Pre-Construct Archaeology Ltd's geoaarchaeologist, Lisa Snape, before being immediately backfilled with the excavated arisings.
- 4.1.5. Following machine excavation, relevant faces of the trench that require examination or recording will be cleaned using appropriate hand tools. The majority of the investigation of archaeological levels will be by hand, with cleaning, examination and recording both in plan and in section.
- 4.1.6. Archaeological evaluation may require work by 'pick and shovel' or occasionally by further use of the machine. Such techniques will be used only for the removal of homogeneous and 'low grade' layers where it can reasonably be argued that more detailed attention would not produce information of value. They will not be employed on complex stratigraphy, and the deposits to be removed must have been properly recorded first.
- 4.1.7. All archaeological features (stratigraphical layers, cuts, fills, structures) will be evaluated by hand tools and recorded in plan at 1:20 or in section at 1:10 using standard single context recording methods. Photographs will also be taken as appropriate.
- 4.1.8. The strategy for sampling archaeological and environmental deposits and structures will be developed by PCA as necessary, in consultation with our specialist sub-consultants QUEST. If appropriate, the Archaeology Advisor to the Local Planning Authority and the English Heritage Regional Archaeological Science Advisor will be consulted. If suitable deposits are found, QUEST will attend site and take samples in accordance with the evaluation brief from Adam Single.
- 4.1.9. The removal of human remains can only take place following the issuing of appropriate licenses from the Ministry of Justice. Should the removal of human remains not pose a risk to the completion of the evaluation, and should further archaeological mitigation be necessary at the site, then any remains will be left in situ, with the agreement of the Archaeology Advisor to the Local Planning Authority.
- 4.1.10. All gold and silver will be removed to a safe place and reported to the local coroner according to the procedures relating to the Treasure Act 1996. Where removal cannot be effected on the same working day as the discovery suitable security measures will be taken to protect the finds from theft.

4.2. Access and Safety

- 4.2.1. Demolition of the buildings on site will have been completed prior to the commencement of the evaluation, but foundations have not been grubbed out.
-

- 4.2.2. Reasonable access to the site will be granted to the Archaeology Advisor to the Local Planning Authority and other representatives of the Council who wish to be satisfied, through site inspections, that the archaeological works are being conducted to proper professional standards and in accordance with the agreements made. Full access is also provided for the Client and its agents.
- 4.2.3. All relevant health and safety legislation, CDM, COSHH regulations and codes of practice will be respected. This requirement constitutes one of the non-archaeological requirements on the excavation design. Pre-Construct Archaeology Ltd's H&S Policy Statement (2012, Appendix 1) and Site Rules (2010, Appendix 2) will be followed at all times. A site specific Risk Assessment will be prepared; this will be reviewed and updated daily by the site supervisor.
- 4.2.4. Upon completion of each of the archaeological trenches and approval from the Archaeology Advisor to the Local Planning Authority, they will be backfilled. Any excess arisings will be left on site. No special compaction measures will be undertaken. No reinstatement of trenches or test-pits will be undertaken.
- 4.2.5. Provision will be made on-site for welfare facilities. These will be supplied by Pre-Construct Archaeology Ltd, as a decontamination unit will be required.
- 4.2.6. All machine movements onto and within the site will be monitored by a banksman.
- 4.2.7. PCA has not been informed that there are any areas of ecological importance or public rights on the site.
- 4.2.8. The site has been secured by the client and therefore Pre-Construct Archaeology Ltd will fence each trench with orange mesh fencing only.
- 4.2.9. The PPE supplied will comprise hard hat, HiVi vest, over-gloves, under-gloves, Wellington boots with steel toecaps, non-disposable coveralls, half masks with A1B1E1K1P3 filters (changed weekly) and pre-filters (changed daily), as well as ear defenders and safety goggles. All relevant filters must be changed and replaced as per manufacturer's instructions. Staff must have their masks face fitted.
- 4.2.10. If asbestos material (suspected or confirmed) is encountered during the excavations its location will be marked, photographed and left in situ. The client will be informed as soon as possible. PCA will not remove any asbestos from site.
- 4.2.11. If groundwater is present within the evaluation trenches, and requires removal to allow work to proceed safely, it will be pumped from the trenches by means of a puddle pump (or similar) and generator, and allowed to drain naturally across the site into an area requiring no access.
- 4.2.12. PCA will notify the Archaeology Advisor to the Local Planning Authority of the commencement of fieldwork 5 days in advance.
- 4.2.13. PCA will maintain an appropriate First Aid Kit on site and will ensure a First Aider is among the site staff.
- 4.2.14. All Pre-Construct Archaeology Ltd's staff are CSCS card holders.

5 RECORDING SYSTEMS

5.1 Site Code

- 5.1.1. A unique-number site code will be obtained from the Museum of London prior to the work commencing, and notified to the Archaeology Advisor to the Local Planning Authority.

5.2 Site Records

- 5.2.1. The recording systems adopted during the investigations will be fully compatible with those most widely used elsewhere in the London Borough of Waltham Forest, which is those developed out of the Department of Urban Archaeology Site Manual, and presented in Pre-Construct Archaeology
-

Ltd's Operations Manual 1 (Taylor 2009). No alternative recording system will be adopted without the prior agreement with the Archaeology Advisor to the Local Planning Authority.

- 5.2.2. The site archive will be so organised as to be compatible with the other archaeological archives produced in the Local Authority area. Individual descriptions of all archaeological strata and features excavated and exposed will be entered onto prepared *pro-forma* recording sheets which include the same fields of entry as are found on the recording sheets of the Museum of London. Sample recording sheets, sample registers, finds recording sheets, accession catalogues, and the photography record cards will follow the Museum of London equivalents. This requirement for archival compatibility extends to the use of computerised databases.
- 5.2.3. A 'site location plan' indicating the site north and based on the current Ordnance Survey 1:1250 map (reproduced with the permission of the Controller of HMSO) will be prepared. This will be supplemented by a trench plan at 1:200 (or 1:100), which will show the location of the areas investigated in relation to the investigation area and National Grid Reference. All sections should be located on plan with OS co-ordinates. The location of the OS bench marks used and the site TBM will also be indicated.
- 5.2.4. A record of the full extent in plan of all archaeological deposits as revealed in the investigation will be made; these plans will be on polyester based drawing film, will be related to the site grid and at a scale of 1:10 or 1:20. 'Single context planning' will be used on site, and the information will be digitised for eventual CAD application.
- 5.2.5. At least one long section will be drawn or a representative part including a profile of the top of the natural deposits (extrapolated from cut features etc., if the trench has not been fully excavated). Other sections, including the half-sections of individual layers or features may be drawn as appropriate to 1:10 or 1:20.
- 5.2.6. The OD height of all principal strata and features will be calculated and indicated on the appropriate plans and sections.
- 5.3. Stratigraphic Matrix
- 5.3.1. A 'Harris Matrix' stratification diagram will be used to record stratigraphic relationships. This record will be compiled and fully checked during the course of the excavations. Spot dating should be incorporated where applicable during the course of the excavation.
- 5.4. Photographic Record
- 5.4.1. A full photographic record of the investigations will be prepared.

6 TREATMENT OF FINDS AND SAMPLES

- 6.1. General
 - 6.1.1. All processing will take place at PCA's Brockley premises, or, if appropriate, those of our environmental consultants.
 - 6.2. Environmental
 - 6.2.1. Different sampling strategies may be employed according to the perceived importance of the deposit or feature under investigation. Close attention will be given to sampling for date, structure and environment. Sample size should be take into account the frequency with which material is likely to occur. Bulk sieving should be employed both for recovery of environmental evidence to ensure that complete samples of artefactual evidence are collected for significant deposits.
 - 6.2.2. The strategy for sampling archaeological and environmental deposits and structures (which can include soils, timbers, pollen, diatoms, animal bone and human burials) will be developed in consultation with the Archaeology Advisor to the Local Planning Authority and, if necessary, the English Heritage Regional Archaeological Science Advisor. Subsequent on site work and analysis of
-

the processed samples and remains will be undertaken by our own consultants and specialist sub-contractors.

- 6.2.3. A high priority will be given to sampling river and other anaerobic deposits, such as peat, where organic materials may be preserved. Organic samples will be subject to appropriate specialist analysis.
 - 6.2.4. All finds retrieval policies of the Museum of London will be adopted and all identified finds and artefacts will be retained according to the stated selection retention and retrieval policy appropriate to the material type and date. No finds will be discarded without the prior approval of the Archaeology Advisor to the Local Planning Authority.
 - 6.2.5. All finds will be treated in a proper manner and to standards agreed in advance with the recipient museum. They will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the guidelines set out in the United Kingdom Institute for Conservation's '*Conservation Guidelines No.2*' and the Museum of London's '*Standards for the Preparation of Finds to be Permanently Retained by the Museum of London*'. All metal objects will be x-rayed and then selected for conservation (except in those cases where the Archaeology Advisor to the Local Planning Authority agrees that this will not be necessary).
 - 6.2.6. Ceramic (pottery, clay tobacco, building material fabric and brick form) reference collections, housed at the Museum of London should be referred to for descriptive and analytical purposes in order to ensure that terminology is consistent.
 - 6.2.7. Before commencing the excavation the archaeological organisation responsible for the works will confirm in writing to the Archaeology Advisor to the Local Planning Authority that arrangements are in hand to cover all necessary processing, conservation, and specialist analysis and storage of finds and samples.
-

7 ARCHIVES AND REPORTS

7.1. General

- 7.1.1. The integrity of the site archive will be maintained. The finds and records will be available for public consultation. Appropriate guidance is set out in the Museum and Galleries Commission's *Standards in the Museum Care of Archaeological Collections* (1992) and *Towards an Accessible Archaeological Archive. The Transfer of Archaeological Archives to Museums: Guidelines for Use in England, Northern Ireland Scotland and Wales* (SMA 1995). For deposition with the London Archaeological Archive and Research Centre (LAARC), the *Guidelines for the Preparation of Archaeological Archives* will be followed.
 - 7.1.2. The client agrees, by approval of this document, to donate all finds and archives to the London Archaeological Archive and Research Centre (LAARC). If finds are not to be transferred to LAARC, arrangements will be made for a comprehensive record of all relevant materials (including detailed drawings, photographs and descriptions of individual finds), which can instead constitute the archaeological archive.
 - 7.1.3. Upon completion of the fieldwork project, when the Archaeology Advisor to the LPA confirms that no further work is required and when all post-excavation reports have been approved by all relevant parties, PCA will obtain from the Museum of London a draft Deed of Transfer allowing the custody of the site archive to be transferred to LAARC. The draft will be issued to the client for approval and then for signing. With this in place, the archive will then be transferred to LAARC by PCA.
 - 7.1.4. The minimum acceptable standard for the site archive is defined in the *Management of Archaeological Projects* 5.4 and *Appendix 3*. It will include all materials recovered, (or the comprehensive records of such materials as referred to above) and all written, drawn, and photographic records, including a copy of all reports relating to the investigations undertaken. It will be quantified, ordered, indexed, and internally consistent before transfer to LAARC. It will also contain a site matrix, a site summary and brief written observations on the artefactual and environmental data.
 - 7.1.5. United Kingdom Institute for Conservation guidelines for the preparation of excavation archives for long term storage (1990) will be followed.
 - 7.1.6. A short summary of the results of the work, even if negative, will be bound into the client report for submission to the LPA and the Greater London HER along with the GLHER report form as soon as possible after the completion of archaeological works.
 - 7.1.7. Minimum requirements for public dissemination is for OASIS report forms to be submitted to the OASIS Project as soon as possible of within 6 months of completion of fieldwork, and the provision of a short paragraph summary of the results for publication in the *London Archaeologist: Excavation Round-Up*. Such publications will meet the minimum requirements set out in *Appendix 7, Management of Archaeological Projects* (1991), and derive from a 'phase 2 review' as defined in the same document. There is a need to format reports so that the details of the proposed development impact can be separated from the information and enable all archaeological information to be made available to the GLSMR within 6 months of the completion of fieldwork. A copy of the client report will be sent to the Local Studies Library.
 - 7.1.8. Where the mentioned 'phase 2' review indicates the need for further assessment and analysis the recommendations set out in the *Management of Archaeological Projects* 1991 will be followed.
-

7.2. Report

7.2.1. Notwithstanding details included above all fieldwork and results will be fully recorded and an Evaluation Report prepared. Copies of the report will be forwarded to the commissioning Client and the Archaeology Advisor to the Local Planning Authority.

7.2.2. The evaluation report will include the following items:

- Non-technical summary;
- Introduction;
- Planning Background;
- Previous archaeological work relevant to the evaluation;
- Topography of the site;
- Research objectives;
- Methodology;
- The results of the evaluation and their significance;
- An assessment of the results against original expectations and a review of the effectiveness of the evaluation strategy;
- Statement of potential of the archaeology;
- Conclusions (and recommendations following consultation with the Council);
- Bibliography;
- Acknowledgements;
- OASIS form.

7.2.3. The project resource agreed between PCA and the client allows for the production of an evaluation report, to include CAD illustrations and artefact assessment as necessary. It is intended that PCA will provide our client a draft copy of the evaluation report for comment within two weeks of the completion of the evaluation, to then be provided to the Archaeology Advisor to the Local Planning Authority.

8 SIZE AND STRUCTURE OF EXCAVATION TEAM

8.1. The day to day direction of the fieldwork will be undertaken by a member of staff who has considerable experience of working in the urban environment and with an understanding of the landscape issues associated with this site.

8.2. The excavation team will be selected from current staff and will total the supervisor and one archaeologist.

8.3. A standard working day is 08.00 - 16.30. A morning and afternoon tea break and 45-minute lunch break are included within this period. Any workings outside of these times are considered to be overtime. Overtime rates are 150% Monday-Friday & all day Saturday, 200% Sunday and Bank Holidays.

9 PROGRAMMING

9.1. It is intended that the evaluation will commence on 11th April, pending approval of this document by Adam Single, Archaeology Advisor to the London Borough of Barking and Dagenham. The on-site fieldwork is programmed to take 8 working days to complete.

10 BIBLIOGRAPHY

Sargent, A, 2006 An Archaeological Watching Brief at the British Rail Goods Yard, 213-215 Blackhorse Road, Walthamstow, London Borough of Waltham Forest Pre-Construct Archaeology Ltd unpublished report

APPENDIX 1: PCA H&S POLICY STATEMENT (2012)



In all we do health and safety comes first

HEALTH AND SAFETY POLICY AND PROCEDURES

1. INTRODUCTION

Pre-Construct Archaeology Limited (PCA) is committed to ensuring the health, safety and well-being of all employees and those who may be affected by our working practices. The Board of Directors understands that health and safety consideration is not a luxury but a foundation to an effective and efficient working environment.

This policy sets out how the company can comply with current legislation and best practice in order to ensure adequate control of the health and safety risks arising from our work activities by:

- providing and maintaining safe plant and equipment;
- ensuring safe handling and use of substances;
- providing safe plant and safe systems of work;
- providing suitable and sufficient information, instruction, and supervision for employees;
- ensuring all employees are competent to do their tasks, and to give them adequate training;
- consulting with our employees on matters affecting their health and safety;
- preventing accidents and cases of work-related ill-health; to review and revise this policy as necessary at regular intervals.

All members of staff, whatever their role within the company, have an absolute duty to:

- take reasonable care for their own health and safety;
- take reasonable care for the safety of anyone who may be affected by their acts or omissions;
- co-operate with the Directors, Management and Supervisory staff and comply with the company's Health and Safety Policies and Rules to enable the company to fulfill their statutory obligations;
- not recklessly or intentionally misuse or interfere with anything provided in the interests of health and safety.

Health and safety considerations take precedence in all instances of conflict with regard to working practices. All staff are encouraged to report any shortfalls in the management of health and safety to their line manager, or Health and Safety Officer, and if no satisfactory resolution is found, to the Management, Directors and Managing Director.

The company's current Health and Safety Policy and relevant Risk Assessments will be brought to the attention of all employees, volunteers, visitors, sub-contractors, customers and partners at all of PCA's places of work. The Health and Safety Executive Health and Safety Law poster (2009) will also be prominently displayed.

The company Directors' are committed to ensuring that the Health and Safety Policy is implemented and its implementation kept up to date, particularly as we change,

improve or add to our systems of work. As a framework for this, the contents of this policy and its execution will be reviewed regularly, but at least on a yearly basis.

The information herein contained does not supersede statutory regulations among which are:

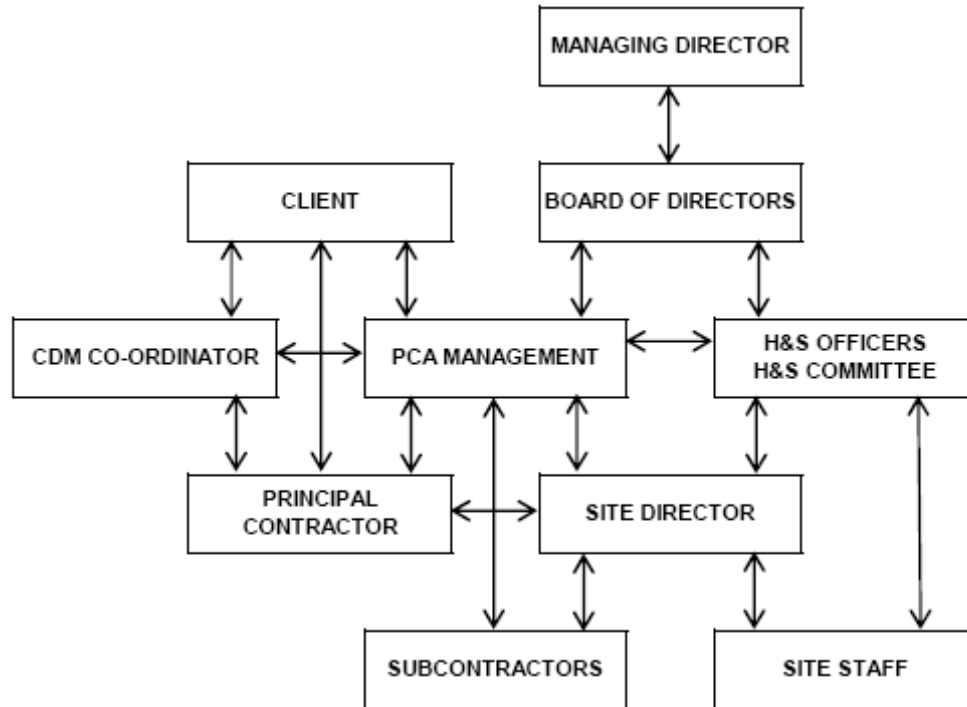
Health and Safety at Work etc. Act 1974
The Health and Safety at Work etc. Act 1974 (Application to Environmentally Hazardous Substances) (Amendment) Regulations 2005
The Management of Health and Safety at Work Regulations 1999
The Management of Health and Safety at Work (Amendment) Regulations 2006
The Construction (Design and Management) Regulations 2007
The Workplace (Health, Safety and Welfare) Regulations 1992
Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR) amended 2012
The Control of Substances Hazardous to Health Regulations 2002 (COSHH)
The Health and Safety (Consultation with Employees) Regulations 1997
The Manual Handling Operations Regulations 1992 (as amended 2002)
The Health and Safety (Display Screen Equipment) Regulations 1992 (as amended 2002)
The Personal Protective Equipment at Work Regulations 1992 (as amended 2002)
Work Equipment Regulations 1998 (PUWER 98)
Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)
Health and Safety (Young Persons) Regulations 1997
The Confined Spaces Regulations 1997, and approved code of practice, regulations and guidance L101 2002
The Work at Height Regulations 2005
The New Road and Street Works Act 1991
The Factories Act 1961 (relevant parts)
The Fire Precautions (Factories, Offices, Shops and Railway Premises) Order 1989
The Fire Precautions (Workplaces) Regulations 1997 (amended 1999)
The Health and Safety (Safety Signs and Signals) Regulations 1996
The Health and Safety (Training for Employment) Regulations 1990
The Electricity at Work Regulations 1989
The Control of Asbestos Regulations 2006 amended 2012
The Carriage of Dangerous Goods and Transportable Pressure Vessels (Amendment) Regulations 2003
The Control of Noise at Work Regulations 2005
Electricity at Work Regulations 1989
Construction (Head Protection) Regulations 1989
Health and Safety (First Aid) Regulations 1981, as amended 2002
Control of Vibration at Work Regulations 2005
The Railways and Other Guided Transport Systems (Safety) Regulations 2006

and all other Regulations and Codes of Practice that affect Pre-Construct Archaeology in executing its operations.

2. ORGANISATION

Though ultimate responsibility lies with the Managing Director, Gary Brown, all employees of Pre-Construct Archaeology have a part to play in the successful application of the company's Health and Safety Policy.

PRE-CONSTRUCT ARCHAEOLOGY HEALTH AND SAFETY STRUCTURE



Director Dr. Frank Meddens, as Health and Safety Manager, is responsible for the management of the company's health and safety system and ensuring that it is compliant with all relevant and current legislation. It is the responsibility of Mr Alistair Douglas, as Health and Safety Officer, to assist the Health and Safety Manager with the management and application of the company's health and safety system. With respect to the application of the company's health and safety system in the Durham, Stapleford, Winchester and Market Harborough offices respectively the regional managers at these offices, Mr Robin Taylor Wilson, Mr Mark Hinman, Mr Paul McClulloch and Mr Kevin Trott have the day-to-day H&S responsibility delegated to them.

Pre-Construct Archaeology's Directors and Managers will ensure that all members of staff engaged on a project will be competent to carry out their assigned tasks based on their experience, training, instruction and supervision. A personnel file will be held and maintained by the company administration in order that a central record of an individual's experience, training and qualifications is available to ensure suitability for specified tasks. Additional training records are maintained by the company which comprehensively list all relevant training for all staff. The Directors and Managers will ensure that sufficient resources, including time, personnel and funds, are available to deal with all relevant health and safety issues as required for any particular place of work.

During the planning stages of a new project, PCA's Project Managers are responsible for collating all available relevant information relating to health and safety concerns, including use of the PCA Archaeological Excavation Risk Notification Form and consultation with the client or their representative such as CDM Co-ordinator and/or Principal Contractor. Based on this information, the Project Manager will, together with the Health and Safety Officers if necessary, identify any specific needs, such as plant, equipment, training and systems of work, and prepare a Health and Safety Method Statement and Risk Assessment which will be available to the site supervisor or director in advance of site work commencing.

Where PCA is in the position of Principal Contractor, the Project Manager will be responsible for ensure that any project where the fieldwork takes 30 days or more, or 500 person days or more, is notified to the Health and Safety Executive.

The Project Manager will provide the site supervisor or director with all relevant information, instruction and training for all known health and safety issues regarding the site. Prior to work commencing the site supervisor or director or nominated competent person, will undertake an inspection of the site and complete the site-based Risk Assessment Form. Any controls necessary to mitigate health and safety concerns not previously identified will be emplaced and the results of the risk assessment shared with all relevant parties. The Risk Assessment will be regularly reviewed and revised during the course of the project and inspected

by the Project Manager. Following completion of the fieldwork, a copy of this risk assessment will be retained for archiving.

The site director will establish the necessary Emergency Procedures and display the position of muster points, together with the names of relevant personnel and location details and number of the nearest hospital A&E department, in a prominent place. It is the responsibility of all site supervisors and directors to ensure that all staff, volunteers, visitors and sub-contractors are aware of all relevant information regarding health and safety concerns in the form of an induction given prior to beginning work on site.

The Project Manager, together with the site supervisor or director, is responsible for ensuring compliance with relevant legislation, the company's Health and Safety Policy, the site rules and that the necessary controls are in place to mitigate risks identified in the Risk Assessments. Compliance with any relevant Principal Contractor's Policies, rules and Risk Assessments will also be monitored.

Staff are actively encouraged to discuss health and safety issues in the first instance with their line manager and if necessary with a Health and Safety Officer, Manager, Director or the Prospect Safety Representative who represents all the employees in meetings of the Health and Safety Committee. The company Health and Safety Committee is formed of the Health and Safety Manager and/or Officer, Safety Representative and a representative from the Project Managers. Regional managers will report any issues for discussion in this forum to PCA's Health and Safety manager in advance of the next scheduled committee meeting. The Committee meet regularly, nominally on a quarterly basis with the aim to:

- review the effectiveness of measures to promote and improve health and safety;
- promote co-operation between employer and employees on health and safety matters;
- review any health and safety issues arising from fieldwork activities;
- facilitate the communication of health and safety information.

3. ARRANGEMENTS

The following systems and procedures detail how Pre-Construct Archaeology intend to implement this policy to comply with the relevant legislation and achieve best practice

Risk Assessments

Risk assessments form the cornerstone of modern health and safety management. Pre-Construct Archaeology will ensure that a suitable and sufficient assessment has been made by a competent person for all places of work and for all activities undertaken during the course of our work.

The assessment will endeavour to identify all hazards; assess all who may be affected by the hazard and how; evaluate the risks and action the necessary controls to minimise the risk according to a hierarchy of control; be recorded and reviewed as necessary.

Equipment

Mr Chris Cooper (PCA logistics Manager) is responsible for the maintenance of and issuing of any and all equipment used by PCA staff on sites. He will ensure that all equipment is in good working order, and that it is only issued to personnel who have been trained in its use, and where necessary have the appropriate and current certificates. All equipment will be regularly inspected where necessary by qualified independent sub-contractors to ensure its continued safe operation. At the regional offices the regional managers fulfil this role or delegate it to a nominated person whose particulars are registered with PCA's Health and Safety Manager.

All new equipment will be assessed for any associated risks before being used. Any member of staff asked to use new equipment will be instructed in its use and informed in how to operate it safely.

All members of staff must ensure they are familiar with the correct use of tools and equipment involved in the tasks they are performing and not use plant or equipment that they are not trained or authorised to do so.

10.1.1. Personal Protective Equipment

Mr Chris Cooper will be responsible for the issuing and recalling of any and all PPE. Where necessary, in consultation with Dr Frank Meddens, he will identify any special training required in its use and ensure that personnel issued with any specific PPE are qualified in its use. At the regional offices the regional managers will carry out this duty, supported by Mr Chris Cooper who will provide advice and PPE when required. Copies of relevant records will be lodged by regional managers with Mr Chris Cooper.

10.1.2. Training

In order to comply with the requirement to employ competent persons, PCA's Health and Safety Officers maintain a record of all training received by staff and review training and re-training needs to ensure qualifications are kept current.

PCA's Health and Safety Officers, Directors and Managers receive formal training in the legal framework of Health and Safety, Construction Design & Management, Management Health and Safety, Health and Safety Policies, Risk Assessment, Control Measures, Training, and Monitoring Systems. Responsible persons (such as supervisors & directors) receive formal training in the legal framework of Health and Safety and Risk Assessment Procedures and other relevant regulations.

Specific training requirements are established with respect to any plant or equipment, hired or purchased for use by PCA staff or for specific tasks such as work in confined spaces.

Formal courses are organised and given by an officially recognised local Further Education College, recognised and licensed Health and Safety training organisation or by suitably qualified trainers.

Copies of all training certificates issued to staff in the regional offices are provided by the regional managers for registration with PCA's central records

Personal behaviour

All PCA employees, volunteers and visitors must conduct themselves so as not to endanger themselves or others through their actions or omissions. Any activity or area that is unsafe must not be entered upon and concerns must be reported to the line manager, supervisor or designated responsible person.

All PCA employees, volunteers and visitors should be aware that some contractors and their personnel might have a lower awareness and practice of health and safety. It is emphasised that if the work cannot be made safe, the area of risk must be vacated and the conditions reported immediately to the line manager or supervisor.

No one shall knowingly be permitted or required to work whilst their ability or alertness is impaired by fatigue, illness, or other causes which might expose the individual or others to injury. Anyone known to be under the influence of alcohol and/or drugs shall not be allowed to work whilst in that condition and may, depending upon the circumstances have their employment terminated. Staff are expected to notify their line manager if they or individuals working with them or in their vicinity are unfit to carry out their tasks safely.

10.1.3. Fire Risk Procedures

Full details of Pre-Construct Archaeology's fire precautions and the required actions to prevent fire are set out in the company Fire Safety Policy.

All premises operated by Pre-Construct Archaeology will have a Fire Risk Assessment that will be reviewed on a yearly basis and following any alterations to the premises or a significant fluctuation in the numbers of staff working at the premises. Recommendations of the Risk Assessment(s) will be discussed and implemented. Specific account will be taken of fire risk, detection, escape routes, muster points, and scale and serviceability of fire-fighting equipment.

All relevant fire-fighting equipment will be in place. A fire-drill system is in place and all personnel must inform themselves of the fire drill procedure and escape routes. Every site and office building will have at least one designated Fire Warden.

The Assembly Points and names of any Fire Wardens will be displayed in a prominent position for all sites and premises.

Driving at work

PCA has a driving at work policy details of which should be checked by people who drive for work prior to engaging in such activity. The relevant document is 'Pre-Construct Archaeology Limited Driving For Work - Policy and Procedures Version 1. Date 23 November 2012', and can be obtained from any PCA Project Manager or Safety officer.

10.1.4. First Aid

It is the responsibility of the relevant project manager, assisted by Mr Chris Cooper, that adequate provision of First Aid personnel and equipment is assigned to all projects depending on perceived workplace hazards and risks.

Trained First Aiders will as far as possible be appointed for each place of work and their names will be prominently displayed at the workplace. Mr Alistair Douglas and Mr Chris Cooper will ensure that a sufficiently large pool of First Aid trained staff is available to cover all sites & offices. They will also monitor the timing of follow up courses to ensure that staff certificates are current.

Each site and work location will have a First Aid kit available adequate for the numbers of staff. If treatment is administered by a First Aider, a record of the treatment will be made in the Accident Book. It is the responsibility of the First Aider providing treatment to inform Mr Chris Cooper, the responsible area manager or designated area responsible person of any restocking that is required.

10.1.5. Accident Reporting

All accidents, **including the most minor ones**, must be entered into the Accident Book. This is located in the supervisor's pack issued at the commencement of each site and in locations in each of the company's premises. If in doubt ask the site supervisor or office manager of its whereabouts. Upon completion of fieldwork, any and all completed incident documentation recorded in the site Accident Book will be copied to, checked and filed by Mr Chris Cooper, who will compile yearly accident statistics and review problems jointly with the H&S manager and H&S officers(s) that might otherwise pass unnoticed.

Dr Frank Meddens, or in his absence Mr Alistair Douglas (in the Durham office Mr Robin Taylor-Wilson in the Stapleford office, Mr Mark Hinman, in the Winchester office, Paul McClulloch, in the Market Harborough Office the designated area manager or in his absence Frank Meddens), will be responsible for the investigation and reporting of any accidents, incidents or dangerous occurrences. Report copies are kept on file and are distributed to all parties concerned. Investigation and reporting may also be undertaken by the Prospect Safety Representative.

The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1985 (RIDDOR) sets out the requirements for accident reporting of accidents under the following categories:

- fatal
- major injuries/conditions
- specified dangerous occurrences
- "over seven day" accidents.

PCA's designated Health and Safety Officers are responsible for reporting any RIDDOR notifiable accidents, dangerous occurrences and diseases. This must be reported as soon as possible, following dealing with the consequences of the incident and making safe of the affected area, by the person in charge of the work area. Form AR2 must be completed for Fatal Injuries, Major Accidents/Conditions, Specified Dangerous Occurrences and Over Seven Day Accidents. Within 15 days a completed form F2508 must be forwarded to the Enforcing Authority.

Hazardous Substances

This section applies to the purchase, use, storage and emergency measures applying to substances that can be harmful to health. It takes account of the COSHH, CHIP and REACH Regulations.

Hazardous substances are defined as:-

- substances used directly in work and service user activities (e.g. adhesives, paints, cleaning agents);
- substances generated during work activities;
- naturally occurring substances (e.g. grain dust);
- biological agents such as bacteria and other micro-organisms.

Users must follow the directions on labels or Hazard Data Sheets.

First Aiders and users must be made aware of the procedures to follow in the case of contact with the skin, eyes, inhalation or swallowing. Medical help must be summoned immediately in all cases of exposure to hazardous substances.

All users of the substances identified as harmful must wear the protective clothing provided – gloves, goggles, overalls. If single use, the clothing must be discarded immediately after use. All users must wash hands properly before moving onto other tasks and in particular before food handling.

Hazardous Substances containers must be securely closed and stored in a locked cupboard. Cupboards containing substances must be labeled indicating the hazards and key instructions as to safe use. All spillages must be cleaned up immediately, following any safety instructions. Due regard must be given to the possible additional hazards created from fumes when substances are spilled.

Smoking is not permitted in any indoor area and may also be prohibited on open air sites where smoking is likely to be a fire or other hazard.

Subcontractors

All sub-contractors will be asked to provide Pre-Construct Archaeology with copies of relevant documentation including: their Health and Safety Policy; site specific Risk Assessment and/or Method Statement; Insurance policy documentation; plant operator's licences; maintenance records and COSHH assessments where these may be relevant to PCA's operations. Copies of this documentation will be held retained for archive. A questionnaire is issued to contractors and subcontractors who work with or for Pre-Construct Archaeology, which must be completed by them and be evaluated by PCA Health and Safety Officers to ensure that any contractor we work with is legally compliant.

Any sub-contractor not operating within the standards set by PCA's Health and Safety Policy and/or site specific Risk Assessment, or unwilling to act within them, will have their contract terminated.

All sub-contractors will be provided with relevant copies of the company's documentation including: the Health and Safety Policy; Risk Assessment and/or Method Statements.

Signed:	Position	Date:
	PCA Health and Safety Manager and Director / area manager	

H&S Manager

H&S Officer

Signed by Managing Director:

Frank Meddens 0207 639 9091 07887 730 871

Al Douglas 0207 358 2198



Date: 18/03/2013

APPENDIX 2: PCA H&S SITE RULES (2013)



In all we do health and safety comes first

SITE RELATED SAFETY RULES

General

All PCA staff and volunteers shall work in the safest practicable manner, so as not to endanger themselves, other members of staff or volunteers, contractors, or members of the public.

Statutory safety requirements are the starting point for PCA employees and visitors, and the following safe operating practices and procedures within the PCA Health and Safety Policy.

PCA staff and volunteers must never engage in any activity or enter any area that is unsafe. They must report their concern to the person in charge of health and safety in the workplace. Horseplay, scuffling and other acts, which tend to endanger the safety or wellbeing of employees, volunteers or third parties are prohibited.

No one shall knowingly be permitted or required to work whilst their ability or alertness is impaired by fatigue, illness, or other causes which might expose the individual or others to injury. Anyone known to be under the influence of alcohol and/or drugs shall not be allowed to work whilst in that condition and may, depending upon the circumstances have their employment terminated. Staff are expected to notify their Manager or Supervisor if they are unfit to carry out their tasks safely.

All PCA staff and volunteers should be aware that some contractors and their personnel might have a lower awareness and practice of Health and Safety policy than Pre-Construct Archaeology. It is emphasised that if the work cannot be made safe, PCA staff and volunteers will leave the area of danger and report the conditions immediately to the site supervisor and/or the PCA Health and Safety Officer (Dr Frank Meddens) or in his absence his deputy (Mr Alistair Douglas) or to the Project Manager assigned to the project.

Under circumstances where a previously unforeseen risk comes to light after site work has started, which may lead to subsequent injury or illness of the member or members of staff involved, a record will be generated of the incident and a copy of the report supplied to the member of staff for his or her GP to ensure health monitoring following the exposure or incident.

Risk Assessment

An on-site Risk Assessment must be completed by a competent person prior to staff starting work on a new site and be periodically reviewed. Pro-forma recording sheets should be used to undertake the Risk Assessment which should be reviewed and signed by the Project Manager and returned at the end of the project for archiving.

All staff and visitors must be made aware of the risks associated with their tasks and are encouraged to highlight any shortfalls.

Welfare facilities

The loading and offloading of site offices and accommodation must be planned and supervised by appropriately trained personnel.

The site welfare facilities must be adequate for the number of people on site. They will include access to drinking water and adequate changing facilities, as well as suitable and sufficient toilet and washing facilities, including warm and cold running water or tank supplied equivalent. In addition there will be suitable and sufficient eating and resting amenities.

All PCA staff and volunteers must maintain a high standard of personal hygiene, ensuring that they regularly wash their hands and any other exposed parts of the body that might have become dirty whilst working.

Rest rooms will be non-smoking areas to protect non-smokers from the discomfort and harm-full effects of tobacco smoke.

Personal Protective Equipment (PPE)

All PCA staff, volunteers and visitors must wear steel toe-capped footwear whilst on site. No person is permitted to wear soft-soled footwear (e.g. trainers) on any site.

All PCA staff, volunteers and visitors are to wear safety helmets at all times whilst on site, unless the site has been designated a non-hard hat area.

All PCA staff, volunteers and visitors are to wear high visibility vests or coats at all times whilst on site. Where required for work on sites near railway lines BS EN 471 Class 2 orange vests will be issued.

Hand protection in the form of gloves will be available for site staff. Suitable eye protection must be used whenever there is a risk of flying particles. Additional PPE may be required for specific activities and staff will be made aware of its correct use, care and limitations. Cold and wet weather protective clothing are supplied as needed.

Tools

Only tools appropriate for any specific job must be used. Where special equipment is needed this must be obtained in order to carry out the job safely. All staff will receive appropriate tool, equipment or machinery specific training to ensure safe operation and working conditions.

Site staff must ensure that when using hand tools, they work within an adequate working space and keep a safe distance from other staff. Tools must never be thrown into, out of, or across excavations or on site generally.

Earthmoving equipment/plant

Only qualified, competent and authorised personnel are permitted to operate plant, machinery and other equipment (including chainsaws) or repair and service any equipment. Defective equipment must be taken out of use and reported to the person in charge of the workplace.

Almost all plant will normally be operated by designated sub-contractors. Their equipment must be provided with the relevant certificates and their operators with the appropriate licences, CITB or equivalent. The site supervisor will inspect licences and certificates (including maintenance records for the relevant plant) prior to a machine being permitted to operate on any PCA site.

Where staff are likely to work in proximity to any plant, the implications of this will have been covered in the site risk assessment. Personnel will work with the appropriate PPE, and where required a banksman will be designated.

An experienced member of staff will have inducted any person working with earthmoving equipment in appropriate safe working practices prior to him or her being allowed to work in proximity of the plant.

When working with earthmoving machinery or when working as a designated banksman or both, personnel will not be allowed to stand within the machine's operating radius without prior agreement of the operator. The machine operator will cease operational movements immediately if he or she is not able to observe workers/banksman working in proximity to the plant being operated.

Loads must not be slewed over personnel, vehicles or huts. If loads are lifted over roadways or paths, movement by people or vehicles along these must be stopped for the duration of the machine's operation.

PCA staff and volunteers must be vigilant for the movement of heavy mobile site plant. When approaching such plant, staff and volunteers must ensure the driver has seen them and signal their intentions. Signals must be standard and known to be understood by both parties before using them. When such plant operates in an excavation area the archaeological supervisor will appoint a person to act as 'look out' or 'banksman' to ensure drivers are aware of the presence of archaeological staff and volunteers, and to warn of dangers caused by the plant.

Vehicle or plant access and egress points must be marked as such, and be under direct observation of a banksman.

Contamination

PCA's Health and Safety Officer must be contacted immediately if any unexpected evidence for ground contamination is encountered in the excavations. Work must be stopped in any area where evidence for contamination is encountered until a full assessment of the risks has been completed. Note: evidence for ground contamination frequently comprises ground discoloration or strong smells.

Services

When working in proximity to services, full details must be obtained in advance from the relevant authority, including water & sewage, electricity, gas, telecom/telephone, cable & television companies as well as private property owners.

Cable location equipment must be used in advance of excavation, and repeat checks with the cable and pipe locator must be carried out as works progress. Personnel operating cable location equipment must be trained to the requirements identified in Health and Safety Guidance Document 4.

Where the presence of services is suspected, excavation will only proceed by use of hand tools. Hand-held power tools and mechanical excavators are the main causes of danger and they must not be used in proximity to underground services. Underground services must be assumed to be live until confirmation to the contrary has been supplied.

Where there is any doubt about the identity of an exposed service it must be treated as an electricity cable or gas pipe until proven otherwise.

Where work is carried out on a road or street the 'New Roads and Street Works Act 1991' may apply. For any street works, the work must be supervised by a person qualified under the Street

Works (Qualifications of Supervisors and Operatives) Regulations 1992. There must also be a person trained under these regulations present while any works are carried out on site.

Excavations

Scaffolding and shoring is only to be erected, altered, dismantled, or inspected by a qualified, competent and authorised person.

Weak structures, obstructions, overhangs and loose or unstable material in or near excavations must be reported to the site supervisor, then removed if it is safe to do so and where necessary following a specific Risk Assessment.

Barrow runs and walkways should be located at a safe distance from the edge of any excavation. They should be of adequate width. Scaffold boards or staging should be in good condition, free from splits, warping, nails or loose metal strips, and must be adequately supported in accordance with the manufacturer's/supplier's instructions.

Where barrow runs and walkways span a void or a deep excavation extra width and support may be necessary, in addition to guardrails and toe boards as edge protection.

Vertical steel grid pegs protruding from the ground must be covered with PCA approved grid peg covers except whilst in immediate use.

Any excavation area must be protected by appropriate safety barriers and signage. Areas around excavations must be kept clear of tools, loose material and spoil. The latter should be at least 1.5m from the edge of trenches. PCA staff and volunteers are not permitted to run on site, nor jump across trenches.

Any excavations greater than 1.2m in depth, or where soil conditions or engineering recommendations require it, will need to have relevant support works in place, such as battering, stepping or shoring. The installation and inspection of shoring works will be the responsibility of qualified shoring contractors, will be to an agreed design, and will be carried out to BS 6031 (1981) and to the practices reported on, in CIRIA Report 97 (1992). Where there is flooding risk cofferdams/caissons will be installed with pumps of a suitable capacity.

Excavations with vertical sides of 2m or more in depth will require substantial barriers, comprising anchored guardrails where necessary with toe boards. Barrier tape or Heras fencing will not suffice.

The ground base for any ladder must be firm and level. All ladders must be installed at a base-to-height ratio of 1:4. They must be secured against slipping by tying at top and bottom and must be regularly inspected.

Any excavation will be assessed with respect to ventilation risk, and the potential for gas and flooding problems with regard to classifying it as a confined space.

If an excavation is classified as a confined space then a full assessment following the Confined Spaces Regulations 1997 will follow, and only personnel who have been trained by a qualified trainer, who have been issued with the appropriate equipment and who are under authorized supervision will be allowed into the trenches.

Storage and use of LPG

Cylinders must be stored upright in a lockable container which must be appropriately marked for the fire brigade. Only cylinders attached to equipment will be allowed in work/rest areas. Dry powder fire extinguishers will be available. Cylinders and equipment attached to them will be kept away from flammable materials. Personnel using the equipment will be instructed in its use,

detecting leaks and the use of fire extinguishers. Equipment will be regularly maintained (at least yearly).

Recording of historic standing buildings

Standing building work includes a series of additional risks which must be taken account of in all recording work carried out on the in or outside of standing structures.

Prior to any work commencing an assessment of the stability of the structure and any working surfaces will be established and where necessary appropriate mitigation measures put in place.

Prior to work commencing the condition of the services will be reviewed. Where there is a need for task lighting, 110V power supply will be favoured.

The presence and nature of any vermin or mould growth inside the structure (such as rats, birds or insect infestation) will be considered and appropriate mitigation measures taken.

The presence of any unauthorised site use by members of the public must be taken into account and site access restricted. Where syringes, chemical containers or other items of concern are identified PCA's H & S officers must be consulted in order to ensure removal and safe working practices prior to work commencing.

Any scaffolding or mobile scaffold tower erected and used must satisfy the Working at Heights Regulations nationally required safety standard and must be erected, used and inspected by appropriately trained staff.

Other

Piled stores, goods, equipment, and parked vehicles must not be permitted to obstruct any sign fire exit or muster station. All signs must be inspected regularly to ensure they are in the correct position and are clean and legible at all times.

It is not permitted for one person to work alone on a site. PCA staff and volunteers must abide by this rule on all projects. On some projects it may be acceptable for a lone representative of Pre-Construct Archaeology to carry out a Watching Brief as long as another individual, for example a contractor, is working with that person.

Volunteers or members of the public are not allowed onto archaeological sites or into PCA offices unless accompanied by a PCA staff member.

PCA staff and volunteers working on sites where contractors are present must ensure that the contractor's personnel are aware of their presence and of the work they intend to carry out. Contractors are to be asked about the work they are carrying out and how this might affect PCA staff and volunteers.

The PCA health and Safety Policy, together with these rules cannot and does not cover all imaginable risks. Any site or location where PCA staff are asked to operate must be reviewed and physically inspected with a view to establishing all risks associated with the particular project. These hazards will then be mitigated prior to staff starting work.

APPENDIX 3: SITE SPECIFIC CONTAMINATION RISK ASSESSMENT

WILLOWFIELD SCHOOL BLACKHORSE ROAD, WALTHAMSTOW,
LONDON E17 Ground contamination Risk assessment for archaeological works
By Frank Meddens 13/02/2013

Based on data contained in: report - SMBaed10253-140909-LQS F1.lwp

The Made Ground was generally found to be thicker in the western part of the site, although locally deepened areas of Made Ground were also noted in the east. The greatest thickness of Made Ground (up to 4.0m) was encountered in the western tip of the site.

Numerous occasions of elevated levels of heavy metals, PAH and TPH within the shallow made ground have been flagged up in the ground investigation report (SMBaed10253-140909-LQS F1.lwp). The current risk assessment summarises the identified ground contamination and lists a sample of the recorded exceedence. It is not to be used or seen as an exhaustive on which the ground conditions can be modelled. The site can be considered moderately contaminated – precautions will be necessary – for staff to be able to work safely.

PAH / TPH / VOC etc exceedences examples:

- PAH 1,900 mg/kg in TP6
- TPH 6,400 mg/kg in TP5
- TPH 29,784 mg/kg in the TP102
- TPH WYG TP102 47,951 mg/kg
- TPH BH203 at 1.00m bgl (45,786 mg/kg)
- TPH TP204 at 0.20m bgl (27,399 mg/kg)
- TPH TP207 at 0.50m bgl (21,152 mg/kg)
- TPH (up to 3,477 µg/l in TP102 at 0.50m bgl)
- TPH Babbie TP7 62,000 mg/kg
- TPH Babbie TP2 57,000 mg/kg
- TPH Babbie TP6 37,000 mg/kg
- TPH WYG BH101 36,647 mg/kg
- TPH Babbie TP4 32,000 mg/kg
- TPH WYG TP104 28,454 mg/kg
- TPH Babbie TP5 28,000 mg/kg
- TPH Babbie TP3 28,000 mg/kg
- TPH Babbie TP13 28,000 mg/kg
- TPH Babbie TP9 21,000 mg/kg
- PAHs (phenanthrene up to 9.23 µg/l in TP105 at 0.50m bgl)
- naphthalene up to 12.21 µg/l in TP104 at 1.10m bgl)
- ammonium (up to 117 µg/l in TP104 at 1.10m)
- ammonium (up to 3,141 µg/l in TP104 at 1.10m)
- anthracene (up to 32.34 µg/l in BH101)
- benzo(a)anthracene (up to 39.97 µg/l in BH101)
- benzo(a)pyrene (up to 22.61 µg/l in BH101)
- benzo(k)fluoranthene (up to 11.82 µg/l in BH101)
- benzo(g,h,i)perylene (up to 14.64 µg/l in BH101)
- chrysene (up to 38.081 µg/l in BH101)
- indeno(1,2,3-cd)pyrene (up to 19.68 µg/l in BH101)
- fluoranthene (up to 81.12 µg/l in BH101)
- naphthalene (up to 33.05 µg/l in BH101)
- phenanthrene (up to 129.14 µg/l in BH101)
- TPH 66,004 µg/l in BH103
- ammonia (1,837 µg/l in BH101)

Ground gas issues:

Ground gas monitoring did not identify any ground gas issues at the site, although Oxygen levels were found to be depressed below 10 % v/v in BH206 during a monitoring visit of 11/04/07 and BH203 and BH204 during the monitoring visit of 12/06/06.

Heavy metal contamination examples:

Contaminant	Location	Depth below gl	Mg / kg
-------------	----------	----------------	---------

Arsenic	BH201	0.20	111
Arsenic	BH203	0.20	23
Arsenic	Babtie WS19	0.4	32
Arsenic	Babtie TP15	0.4	24
Chromium	WS206	0.70-0.80	293
Nickel	WYG TP104	1.10	284
Lead	BH201	0.2	1709
Lead	Babtie TP2	0.4	4600
Lead	Babtie TP4	0.80	5600
Lead	Babtie TP15	0.15	2500
Mercury	Babtie TP15	0.15	15
Mercury	BH205	0.35	2.1
Total Cyanide	BH201	0.2	6
chromium	BH201	0.2	97
chromium	Babtie TP7	0.4	200
chromium	WYG TP104	1.10	182

Ground water issues:

Groundwater levels across the site varied between 0.65m and 4.23m bgl across the site

Groundwater elevated concentrations of tetrachloroethene and PAH in the north east of the site as well as elevated levels of hydrocarbons and heavy metals across the site.

Surface contamination issues include:

In the area of the former builders yard a heap of discarded building materials, propane, cylinders and empty oil barrels is present.

At the point of ingress to the scaffold yard two above ground storage tanks are present in the south, adjacent to the access road.

In the laundry compound three above ground storage tanks with leaking pipework are located, with a further large black heating oil tank adjacent to the north east corner of the laundry building. In the area of the laundry compound are patches of numerous fragments of corrugated cement board, which may contain asbestos. By the southeast elevation of the laundry building was/is a pipe of empty chemical containers which contained hydrogen peroxide, formic acid, liquid starch, disinfectant concentrate, Biosolve liquid laundry booster and sodium hyperchlorate. In addition there were several bags of oxolic acid.

The former scrap yard comprised an open area of land with a heap of fly-tipped material.

In the area of the former Circle Anglia site are the remains of a former air raid shelter.

The risk site archaeologist will be exposed to are: ingestion of particles on soil; inhalation of dust and vapour; and dermal contact with particles in soil.

Other buried risks:

A water main is known to pass at depth from the north to the south in the west end of the site (former scrap yard area), between TP201 and TP207 / BH203. PCA will not carry out excavations in this sector of the site nor will any plant be allowed to move across this area.

Precautionary measures to be followed:

PCA because of the proximity of archaeologist contact with the soils they excavate use domestic gardens and allotments criteria in assessment of risk and deciding what level of precautions to mitigate risk.

The site welfare facilities will comprise designated dirty and clean areas which will be strictly adhered to. Clean areas will only be entered with clean kit, clothing, shoes etc. Records will be clean when taken into the clean area; i.e. any which have potentially contaminated material / soil visibly adhering will be copied onto clean versions prior to the clean copies being taken into the clean area.

Staff will change into their PPE in a designated changing room before moving on to site into the contaminated area, and out of PPE before moving into the site clean area. Designated washing facilities and a boot wash will be available. Site staff will wash where necessary but at least their hands before leaving the dirty area and entering the clean facilities.

Eating, drinking (non-alcoholic beverages) or smoking on site will not be allowed in the dirty area or on site.

The PPE supplied will comprise hard hat, HiVi vest, over-gloves, under-gloves, Wellington boots with steel toecaps, non-disposable coveralls, half masks with A1B1E1K1P3 filters (changed weekly) and pre-filters (changed daily), as well as safety goggles. All relevant filters must be changed and replaced as per manufacturers instructions. Staff must have their masks face fitted.

Staff will receive relevant training to ensure appropriate use of the PPE and equipment or refresher training where needed.

A hand held Photo-Ionisation Detector (PID) should be used to measure any exceedences of VOC's in work areas. The work areas should be well ventilated and PCA should vacate any excavation area where VOC trigger levels are exceeded PCA H&S staff notified who will be required to make a further assessment of any risks involved with respect to whether staff will need to cease work in the trench affected and need to be reallocated to another excavation area, or whether there are other mitigation measures required.

Any environmental samples taken in this project will be subjected to a risk assessment to establish any potential risks involved in their processing, assessment or analysis. This risk assessment serves to establish the risk of the samples being contaminated or not. If the contamination risk is deemed high or moderate the samples will be disposed off on site and no further work will be done on them. The decision of PCA's designated Health and Safety staff will be final and binding in this matter. If finds / artefacts of importance are uncovered then these will be cleaned (eg washed) on site prior to being sent to PCA's finds and sample processing facilities.

The nearest accident and emergency unit is at [Whipps Cross University Hospital](#) Whipps Cross Road, London, E11 1NR, telephone 020 3416 5000. In case of an emergency assess the situation, make sure the situation is safe, then call the site first aider or if necessary call 999 for the emergency services. Be sure to inform them of the nature of the emergency and explain to them the quickest and safest route onto site. Following this call the designated project manager and PCA H&S officer.

APPENDIX 4: SITE RISK ASSESSMENT

SITE: WILLOWFIELD SCHOOL, BLACKHORSE ROAD, WALTHAMSTOW, LONDON BOROUGH OF WALTHAM FOREST

Pre-Construct Archaeology Ltd

Prepared By: Helen Hawkins 2.4.13

This risk assessment is designed to identify and devise control measures for all hazards and the risks these pose to employees, sub-contractors, and any other persons working on or visiting excavations. It is the duty of all employees to notify the management of any deficiencies in this risk assessment, so that it can be revised accordingly. Any queries should in the first instance be notified to the site supervisor who will endeavour to resolve any immediate concerns. Please refer to the PCA Health and Safety Policy Statement (2012) for guidance on general policy.

Nearest A & E hospital:

University College Hospital APPROX. 3.7 mile
King George Hospital, Barley Lane, Ilford, Essex, IG3 8YB
Tel: 02089838000

Risk Assessment to be reviewed weekly or as circumstances change

Copy to Project File (tick)

FIELDWORK:

EVALUATION

Assessment Undertaken

Date: 2.4.13

Signed

Assessment Review (set a date)

Date: 11.4.13

Signed

HEALTH & SAFETY RISK ASSESSMENT, WILLOWFIELD SCHOOL, WALTHAMSTOW

Hazard	Nature of Risk	Level of Risk High =H Medium=M Low =L	People at Risk	Controls/Action	Remaining Risk High =H Medium=M Low =L
Electricity substations	Risk of death or injury by electrocution	H	Plant operator, PCA staff, other site personnel, general public	Personnel and plant must maintain a safe distance from electricity substations at all times, using signage, physical barriers and safety chains as appropriate. PCA staff to monitor all plant movement around electricity substations.	L
Underground services (gas, water, electricity and communications)	Risk of death or injury by electrocution or explosion. Disruption of power or communication lines	H	Plant operator, PCA staff, other site personnel, general public	PCA will locate and mark out all known and suspected services using service drawings and CAT detection equipment, and hand investigation where appropriate. Site service drawings have been provided to PCA.	L
				Where exposure of cables and pipes is unavoidable services will then be protected and supported as necessary to prevent damage or collapse. Services are not to be used for access across excavation areas.	
				Any and all services encountered during the works will be assumed to be live (HOLD POINT).	
Plant and vehicle movement	Risk of injury from collision, including trapping or crushing	H	PCA staff, other site personnel, general public	PPE to be worn at all times when in the immediate vicinity of plant and other vehicles.	L
				Ensure driver(s) have seen you, and maintain visual contact at all times when within their working areas.	
				All machining to be undertaken under constant archaeological supervision and due care taken. A PCA staff member will act as a banksperson during all plant movement and operation. Machine should remain well clear of all exposed services at all times, and should not operate in the immediate vicinity or track over any exposed services. Ensure that the banksperson and driver(s) are	

HEALTH & SAFETY RISK ASSESSMENT, WILLOWFIELD SCHOOL, WALTHAMSTOW

Hazard	Nature of Risk	Level of Risk High =H Medium=M Low =L	People at Risk	Controls/Action	Remaining Risk High =H Medium=M Low =L
				fully briefed and clearly understand those signals to be used during machining and plant movement.	
				Provide site staff with an alternate, designated, route away from plant/vehicle runs wherever possible.	
Traffic movement adjacent to site	Risk of death or injury	H	PCA staff, other site personnel, general public	PCA staff to only cross highways at locations where it is safe to do so and where they can be clearly seen in advance by oncoming traffic.	L
				PCA staff to wear high-visibility vests or jackets at all times.	
Mechanical Breaking	Risk of personal injury or damage to vehicles or surrounding buildings	H	PCA staff, other site personnel, general public	Breaking to be avoided if possible (previous footings etc to be left <i>in situ</i>). Should breaking be unavoidable then a minimum of 11m from vehicles, site perimeters and pedestrian and vehicle access ways will be maintained at all times. Breaking to be undertaken under constant supervisor. Full PPE including eye and ear protection to be worn at all times	L
Deep Excavation	Risk of serious injury or death from partial or total collapse of trench sides. Risk of serious injury or death from falls into deep excavations. Risk of injury or death from materials falling into trench from above.	H	PCA staff, other site personnel, general public	All excavations in excess of c1.2m depth will be stepped at a minimum gradient of 1:1 to allow safe working. This will be necessary on all four faces of all evaluation trenches. All excavation areas will be demarcated.. 'Danger Deep Excavation' signs to be erected at site entrances and around areas of deep excavation as necessary and in accordance with the PCA Health and Safety Policy (2012). Fencing and signage arrangements to be reviewed by PCA Site Supervisor on a daily basis. The stability of any baulks and batters will be inspected daily by the PCA Site Supervisor and appropriate additional mitigation measures organised as necessary. Additional fencing, rigid barriers and/or toeboards may be	L

HEALTH & SAFETY RISK ASSESSMENT, WILLOWFIELD SCHOOL, WALTHAMSTOW

Hazard	Nature of Risk	Level of Risk High =H Medium=M Low =L	People at Risk	Controls/Action	Remaining Risk High =H Medium=M Low =L
	Risk of plant running into excavations. Risk of buildings or structures collapsing due to excavations.			necessary around areas of deep excavation and will be reviewed on a daily basis.	
				High visibility vests or jackets, hard hats and steel toe-capped safety boots will be worn at all times on site. Gloves, goggles and disposable suits may also be necessary on site as required.	
				Ensure visitors and members of the public are not put at risk by open trenches. Review daily and consider whether fencing arrangements are adequate.	
				Access and egress to trenches will be either by means of steps cut into a secure trench face or via a secured ladder.	
				The basal area of each trench should mean that that the trenches are not confined spaces. This will be reviewed on a daily basis.	
Groundwater/Perched water	Risk of drowning. Risk of sudden collapse of trench sides. Risk of contamination	M	PCA staff, other site personnel, general public	Monitor any water ingress and use portable pumps as necessary to control groundwater. If water becomes a problem a suitable pump hired by PCA will be used to dewater trenches.	L
Noise	Risk of permanent hearing damage.	H	PCA staff, other site personnel, general public	Manufacturer's data sheet on noise levels to be obtained for all noise generating plant or hire equipment and added to the site Health and Safety file.	L
Dust	Risk of breathing difficulties or permanent damage			Site generators away from area of working to limit noise, wherever possible, and use ear defenders.	

HEALTH & SAFETY RISK ASSESSMENT, WILLOWFIELD SCHOOL, WALTHAMSTOW

Hazard	Nature of Risk	Level of Risk High =H Medium=M Low =L	People at Risk	Controls/Action	Remaining Risk High =H Medium=M Low =L
Exhaust fumes	Risk of illness or death from carbon monoxide poisoning			<p>Assess noise levels and duration of exposure.</p> <p>Ventilate confined spaces where generators are being used and, where necessary, use portable fans/extractors to ensure a free flow of air.</p> <p>Use face masks with appropriate filters.</p>	
Fire	Risk of death or injury	M	PCA staff, other site personnel, general public	<p>Staff to be made aware of the evacuation procedures/assembly points during site induction.</p> <p>Fire extinguishers will be provided on site and all staff will be made aware of their location.</p>	L
Contagion and infection, including Weil's disease (Leptospirosis) from materials and standing water infected by rat's urine Needle stick injuries and other blood borne risks	Risk of serious illness, disability or death.	M	PCA staff, other site personnel, general public	<p>Use available welfare facilities to regularly wash hands, particularly prior to eating. All staff will wear protective gloves on site. All staff to have up to date tetanus inoculations.</p> <p>Waterproof dressings, all wounds covered. Issue of weils card.</p>	L
Ground contaminants	<p>Risk of irritation or illness from ingestion, inhalation or skin contact with contaminants.</p> <p>Risk of inflammable materials.</p>	H	PCA staff, other site personnel, general public	<p>All staff at work on the site will wear PPE comprising:</p> <p>Disposable or waterproof suits Steel toe capped Boots Gloves</p> <p>Goggles</p> <p>Standard PPE in addition to the above will be mandatory (hardhats; Hi Vi vests etc.) Half masks with A1B1E1K1P3 filters (changed weekly) and pre-filters (changed daily) Ear protection will be provided for use if appropriate.</p> <p>Site accommodation provided by PCA will be Oasis Unit & Decontamination Unit. Good hygiene (ie washing hands before every tea break) will be mandatory.</p>	L

HEALTH & SAFETY RISK ASSESSMENT, WILLOWFIELD SCHOOL, WALTHAMSTOW

Hazard	Nature of Risk	Level of Risk High =H Medium=M Low =L	People at Risk	Controls/Action	Remaining Risk High =H Medium=M Low =L
				All staff will require proper induction in site working practices and use of PPE prior to starting work. Any non-compliance on the part of staff will result in their removal from site.	
Use of hired plant (lighting, breakers, floor saws, pumps, etc)	Risk of injury	H	PCA staff, other site personnel, general public	Check plant delivered to site is in good order and fitted with any necessary safety devices and guards. Inspect tools for faults regularly. Use only the appropriate tools for the job. Use of all hired equipment will be managed.	L
				Ensure staff are trained and, if appropriate, certified in use of equipment and are wearing appropriate PPE. Relevant certification of operatives to be photocopied and a copy added to site Health and Safety file.	
Use of hand tools Vibration risks from some types of equipment	Risk of injury	M	PCA staff, other site personnel, general public	Check hand tools for damage, splinters, etc, and organise their repair or replacement as appropriate.	L
				Route all electrical leads or pipes to avoid tripping hazards by being kept up off ground or cordoned off	
Trip/fall hazards	Risk of injury	H	PCA staff, other site personnel, general public	Ensure spoil is mounded a safe distance from trench edges (3m minimum).	L
				Ensure tools and other site materials are placed/stored safely when not in use. Site to be kept in a tidy condition. Leads kept out of walkways, walkways kept clear of materials etc	
				Any additional health and safety issues noted by PCA staff on site should be reported immediately to the PCA Site Supervisor or deputy as soon as can be done safely	
Manual handling	Risk of injury	M	PCA staff, other site personnel, general	Wherever possible use mechanical means to lift and transport heavy and bulky items. Where use of mechanical	L

HEALTH & SAFETY RISK ASSESSMENT, WILLOWFIELD SCHOOL, WALTHAMSTOW

Hazard	Nature of Risk	Level of Risk High =H Medium=M Low =L	People at Risk	Controls/Action	Remaining Risk High =H Medium=M Low =L
			public	means is impracticable, ensure sufficient persons are available to lift the relevant load taking into account the size, shape and weight of that load.	
Unexploded bombs or ammunition	Risk of death or serious injury from explosion	M	PCA staff, other site personnel, general public	PCA staff to be vigilant during all machining and hand excavation. Any suspect objects must not be disturbed but should be reported to the Site Supervisor or deputy immediately. If obvious munitions are encountered, or if an object is suspected to be an explosive device, the area should be marked and cordoned off, the site evacuated and the PCA Project Manager and emergency services notified immediately.	L
Debris on site – may include sharps, needles, wire, fouled areas, etc	Risk of injury or infection	M	PCA staff, other site personnel, general public	Clean areas prior to working, preferably by machine. Gloves will be mandatory. Take specialist advice to provide safe disposal if appropriate.	L
Extremes of temperature	Risk of illness or death from exposure/hypothermia	M	PCA staff, other site personnel, general public	PCA staff to wear warm and waterproof clothing as appropriate. Designated rest breaks to be taken during the course of each day. Heated cabins to be provided.	L
	Risk of illness or death from heat exhaustion or heat stroke	M	PCA staff, other site personnel, general public	PCA staff to carry a sufficient supply of fresh drinking water. Designated rest breaks to be taken during the course of each day.	L
	Risk of sunburn	M	PCA staff, other site personnel, general public	PCA staff advised to wear appropriate clothing ie 'cover-up'.	L
ADDITIONAL ENTRIES TO BE CONSIDERED AT THE INITIAL ON-SITE ASSESSMENT:					

HEALTH & SAFETY RISK ASSESSMENT, WILLOWFIELD SCHOOL, WALTHAMSTOW

Hazard	Nature of Risk	Level of Risk High =H Medium=M Low =L	People at Risk	Controls/Action	Remaining Risk High =H Medium=M Low =L

**HEALTH & SAFETY RISK ASSESSMENT, WILLOWFIELD SCHOOL,
WALTHAMSTOW**

I have read this document as part of my site safety induction and I agree to observe the necessary controls to reduce risks
Signed:

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21

HEALTH & SAFETY RISK ASSESSMENT, WILLOWFIELD SCHOOL, WALTHAMSTOW

22

23

24

25

26

27

28

29

30

31

32

33

34

35

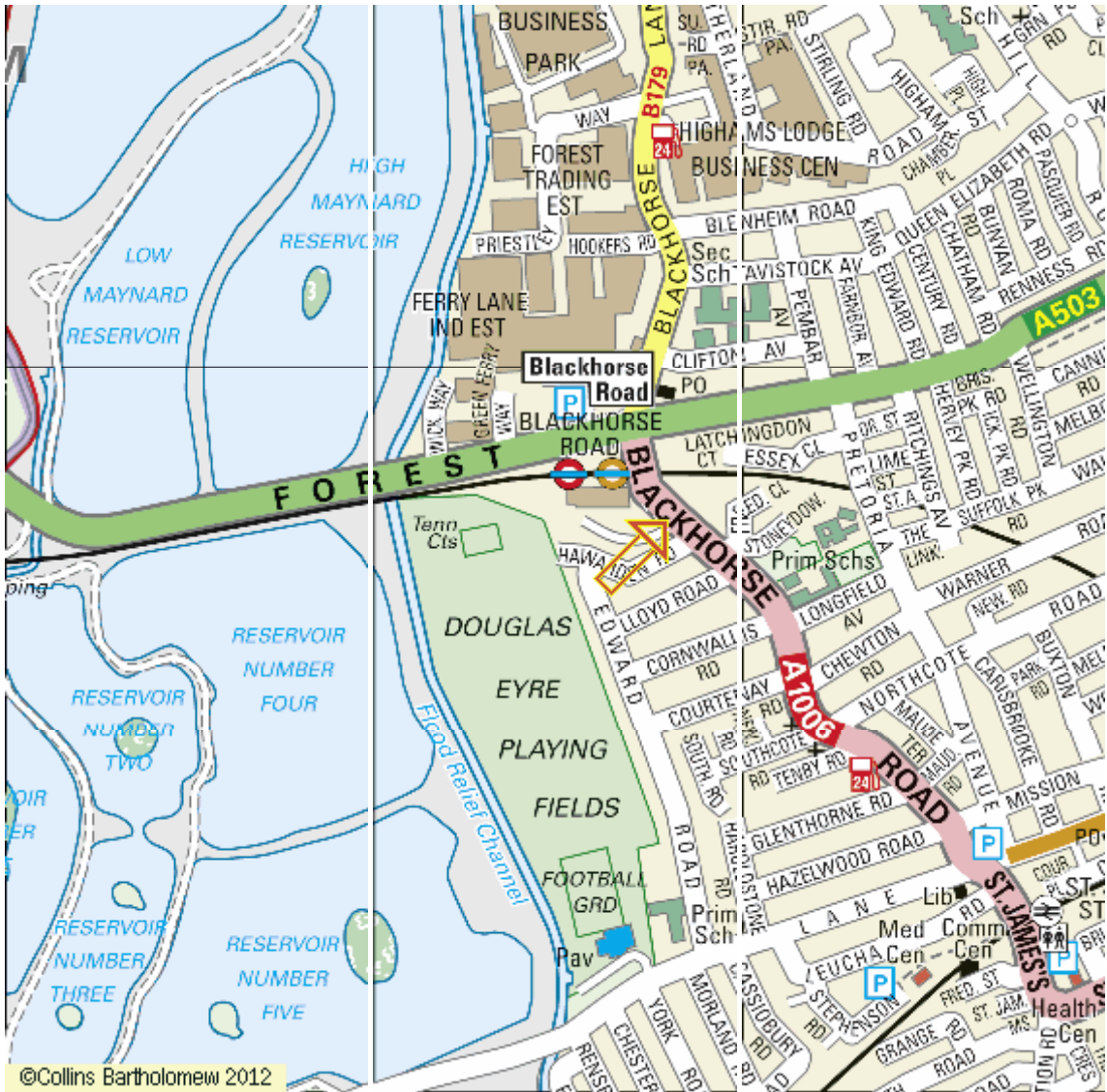
36

37

38

39

40



©Collins Bartholomew 2012

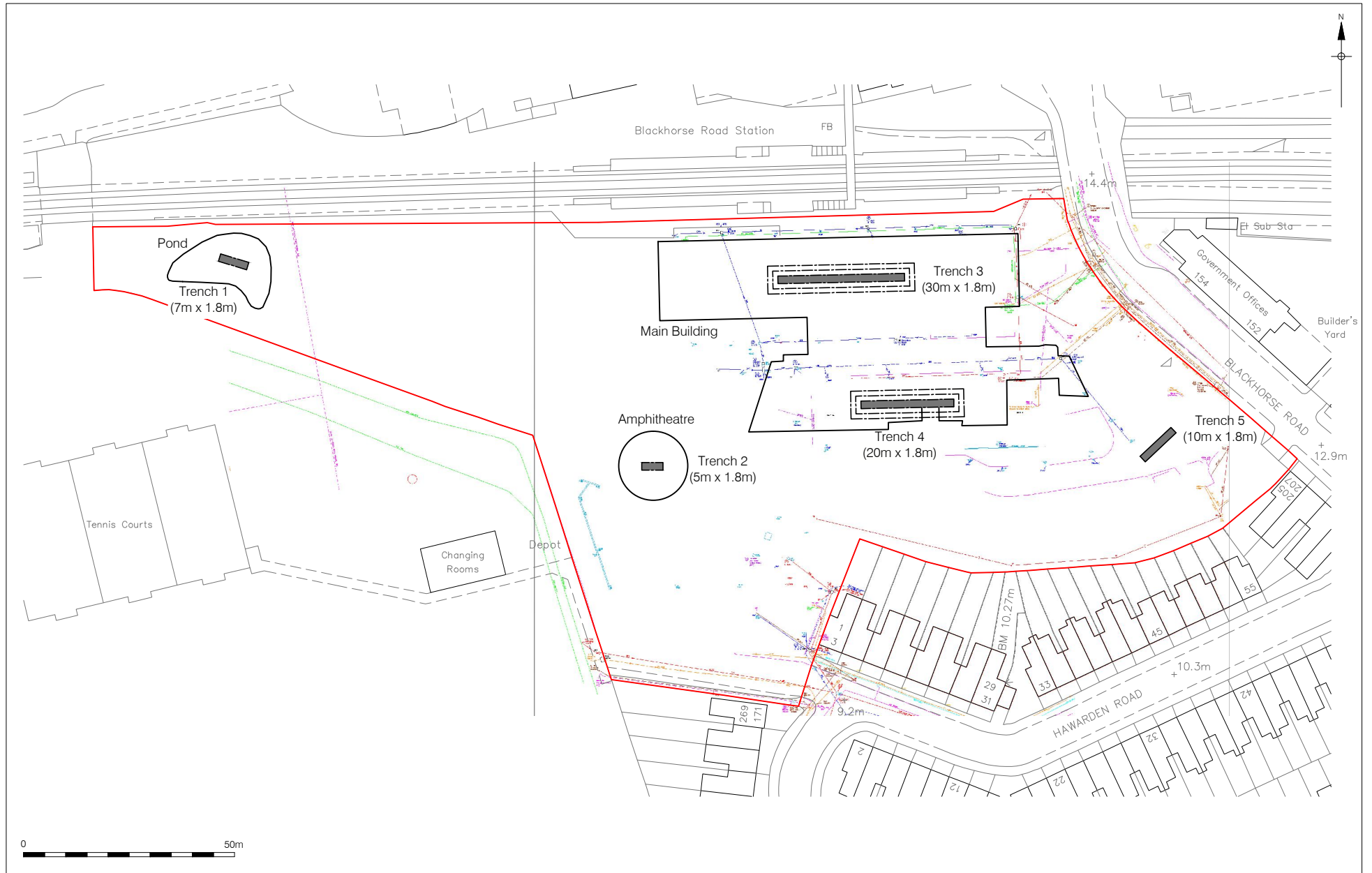


Figure 1
 Proposed Trench Location
 1:1,250 at A4

**APPENDIX 7: AN ARCHAEOLOGICAL WATCHING BRIEF AT THE BRITISH
RAIL GOODS YARD, 213-215 BLACKHORSE ROAD, WALTHAMSTOW,
LONDON BOROUGH OF WALTHAM FOREST**

**An Archaeological Watching Brief at the British Rail Goods
Yard, 213-215 Blackhorse Road, Walthamstow, London
Borough of Waltham Forest**

Site Code: GYW 06

Central National Grid Reference: 535777 189303

**Written and Researched by Andrew Sargent,
Pre-Construct Archaeology Limited,
June 2006**

Project Manager: Tim Bradley

Commissioning Client: Willmott Dixon Housing

**Contractor: Pre-Construct Archaeology Limited,
Unit 54 Brockley Cross Business Centre,
96 Endwell Road, Brockley,
London SE4 2PD**

Tel: 020 7732 3925

Fax: 020 7732 7896

E-mail: tbradley@pre-construct.com

Website: www.pre-construct.com

**© Pre-Construct Archaeology Limited
June 2006**

© The material contained herein is and remains the sole property of Pre-Construct Archaeology Limited and is not for publication to third parties without prior consent. Whilst every effort has been made to provide detailed and accurate information, Pre-Construct Archaeology Ltd cannot be held responsible for errors or inaccuracies herein contained.

CONTENTS

1	Introduction	4
2	Summary of the Archaeological Sequence	5
3	Window Samples	11
4	Hand-Excavated Trial Pits	13
3	Conclusions	15

Figure 1 Site Location

Figure 2 Location of Geotechnical Test Pits and Boreholes

ABSTRACT

This report details the results of an archaeological watching brief of geotechnical boreholes, trial pits (both machine and hand-excavated) and window samples carried out at the British Rail Goods Yard, 213-215 Blackhorse Road, Walthamstow. London clay 'bedrock' was recorded across the site, sealed by a deposit of Thames terrace gravels, also across the entire site. These deposits were both observed to rise toward the east of the site. They were sealed by a layer of alluvium, thus rendering likely the survival of any prehistoric features cut into the gravels. Overlying this, slight evidence for horticultural activity was found in the central portion of the site, and probably represents its use prior to the construction of a goods yard in the late 19th or earlier 20th century. This involved significant ground levelling, specifically truncation of alluvial deposits in the higher eastern half of the site. Varied light industrial usage throughout the 20th century has resulted in the accumulation of layers of made ground and the construction of warehouse structures on the eastern half of the site.

1 INTRODUCTION

- 1.1 An archaeological watching brief of geotechnical boreholes, trial pits (both machine and hand-excavated) and window samples was undertaken between 30th May and 6th June 2006 by Pre-Construct Archaeology Limited at the British Rail Goods Yard, 213-215 Blackhorse Road, Walthamstow, London Borough of Waltham Forest.
- 1.2 The site lies at 213-215 Blackhorse Road, occupies a triangular area of approximately 280m from east to west and approximately 85m from north to south, and has an Ordnance Survey National Grid Reference of 535777 189303. The site is bounded to the north by Blackhorse Road station and to the south by the rear of the properties in Hawarden Road. The eastern half of the site is used by light industry occupying several brick-built warehouse structures, whilst a cobbled road along the southern boundary of the site gives access to the western half of the site, which was most recently a scrap yard but is now waste.
- 1.3 Seven cable percussion boreholes (reduced from eight) and six trial pits (also reduced from eight) were excavated across the site to depths between 4 and 35m. Additionally six window samples and three hand-dug trial pits were excavated to depths of 1.20 to 5m. All boreholes and trial pits were monitored as a watching brief, as were three of the six window samples that were located within the existing warehouse structures.
- 1.5 Willmott Dixon Housing commissioned the work. The project was project managed for Pre-Construct Archaeology by Tim Bradley and supervised by the author. The Museum of London Site Code assigned to the project was GYW 06.
- 1.6 **Note:** This report was prepared before survey data relating to the geotechnical investigation became available. The heights given above Ordnance Datum are therefore calculated from an earlier topographical survey of the site produced by RPS Woods Warren in 2004. Whilst this should provide a good general understanding of the archaeological and geological stratigraphy, all levels in this report should be assumed to be accurate to within a methodological error of $\pm 0.15\text{m}$

2 SUMMARY OF THE ARCHAEOLOGICAL SEQUENCE: BORE HOLES AND TRIAL PITS

2.1 Borehole 201

Context Number	Deposit Description	Height mOD	Thickness m
47	Dark grey sandy silt: probable 20 th century made ground	10.14	0.45
48	Pale to mid brownish grey gravelly clay: alluvium	9.69	1.05
75	Mid brown gravelly clay: alluvium	8.64	1.00
76	Mid grey gravelly clay: alluvium	7.64	1.50
49	Mid orangey brown sandy gravels: terrace gravels	6.14	2.30
50	Pale grey clay: London clay	3.84	27.70

2.2 Borehole 202

Context Number	Deposit Description	Height mOD	Thickness m
24-26 inc.	Tarmac; concrete slab; redeposited sandy clay: 20 th century made ground	10.31	0.90
27	Mid greyish brown clay: alluvium	9.41	1.90
28	Pale to mid orange brown sandy gravels: terrace gravels	7.51	1.80
29	Pale grey clay: London clay	5.71	>0.40

2.3 Borehole 203

Context Number	Deposit Description	Height mOD	Thickness m
8	Dark grey sand silt gravel mix: 20 th century made ground	10.41	1.80
9	Greenish greyish mid brown sandy clay: alluvium	8.61	2.10
10	Mid orangey brown sandy gravel: terrace gravels	6.51	2.10
11	Pale grey clay: London clay	4.41	>4.00

2.4 Borehole 204

Context Number	Deposit Description	Height mOD	Thickness m
1-3 inc.	Sand-silt-gravel mix; concrete slab; clay-sand mix: 20 th century made ground	10.29	1.10
4	Mid greyish brown silty clay: possible horticultural horizon	9.19	0.90
5	Pale to mid greyish brown silty clay: alluvium	8.29	0.50
6	Greyish mid orange sandy gravel: terrace gravels	7.79	3.70
7	Pale grey clay: London clay	4.09	>18.80

2.5 Borehole 205

Context Number	Deposit Description	Height mOD	Thickness m
70-71 inc.	Tarmac; pale to mid greyish brown silty sand: 20 th century made ground	10.26	0.70
72	Greenish brownish mid grey clay: alluvium	9.56	1.00
73	Greenish brown sandy clay: alluvium	8.56	1.30
74	Orangey mid brown sandy gravels: terrace gravels	7.26	>2.00

2.6 **Borehole 206**

Context Number	Deposit Description	Height mOD	Thickness m
77-79 inc.	Tarmac; Cobbled surface; pale greyish brown silty sand: 20 th century made ground	10.21	0.70
80	Pale orangey brown sandy clay: alluvium	9.51	1.70
81	Mid orangey brown sandy gravel: terrace gravels	7.81	1.40
82	Pale grey clay: London clay	6.41	>3.70

2.7 **Borehole 207**

Context Number	Deposit Description	Height mOD	Thickness m
51-52 inc.	Concrete surface; dark grey silty sand: 20 th century made ground	10.54	0.70
53	Mid greyish brown clay: alluvium	9.84	1.20
54	Mid orangey brown sandy gravel: terrace gravels	8.64	3.00
55	Pale grey clay: London Clay	5.64	>5.10

2.8 **Trial Pit 201**

Context Number	Deposit Description	Height mOD	Thickness m
19-22 inc.	Sand-silt-scrap mix; concrete slab; silty sand; sand-clinker mix; 20 th century scrap pile and made ground	11.05	2.50
23	Pale greyish brown clay: alluvium	8.55	>1.50

2.9 **Trial Pit 203**

Context Number	Deposit Description	Height mOD	Thickness m
12-15 inc.	Sand-silt-gravel mix; compacted CBM fragments; concrete slab; silt-sand-rubble mix: 20 th century made ground	11.00	1.30
16	Greenish greyish mid brown silty clay: possible horticultural horizon	9.70	0.50
17	Brownish greenish mid grey sandy clay: alluvium	9.20	2.00
18	Orangey mid brown gravely sand	7.20	>0.10

2.10 **Trial Pit 204**

Context Number	Deposit Description	Height mOD	Thickness m
63-66 inc.	Silty sand; clinker; concrete slab; silt-sand-clinker mix: 20 th century made ground	10.65	1.20
67	Pale orangey brown clay: alluvium	9.45	0.20
68	Pale greenish grey sandy clay: alluvium	9.25	2.10
69	Pale greyish brown sandy gravel: terrace gravels	7.15	>0.50

Note: The deposits in this pit were heavily contaminated

2.11 Trial Pit 205

Context Number	Deposit Description	Height mOD	Thickness m
30-33 inc.	Concrete surface; silty sand; clinker; silty sand: 20 th century made ground	10.44	0.90
34	Mid orangey brown clay-sand-gravel mix: possible alluvial layer	9.54	0.30
35	Mid orangey brown clay: alluvium	9.24	0.50
36	Pale to mid greenish grey silty clay: alluvium	8.74	0.60
37	Mid orangey brown clay: alluvium	8.14	0.9
38	Mid orangey brown sandy gravel: terrace gravels	7.24	>0.80

Note: The deposits in this pit were heavily contaminated

2.12 Trial Pit 206

Context Number	Deposit Description	Height mOD	Thickness m
39-42 inc.	Tarmac; concrete slab; clinker; crushed chalk: 20 th century made ground	10.37	0.38
43	Orangey greyish brown silty sandy clay: possible horticultural horizon	9.99	0.52
44	Mid orangey brown sandy clay: alluvium	9.47	0.50
45	Greenish bluish pale grey clay: alluvium	8.97	1.80
46	Pale grey sandy gravel: terrace gravels	7.17	>0.80

Note: The deposits in this pit were heavily contaminated

2.13 Trial Pit 207

Context Number	Deposit Description	Height mOD	Thickness m
56-59 inc.	Silt-sand-CBM mix; sandy clayey silt; clinker; clay-clinker mix: 20 th century made ground	10.42	0.90
60	Greenish greyish pale brown clay: possible trample layer or horticultural horizon	9.52	0.05
61	Greenish pale grey clay: alluvium	9.47	2.05
62	Greenish greyish pale brown sandy gravel: terrace gravels	7.42	>0.80

3 WINDOW SAMPLES

3.1 Six window samples were excavated as part of the geotechnical investigation. Archaeological monitoring of these was minimal due to the difficulty of analysing the samples through the misted plastic of their casings. However, it was possible to discern the approximate extent of made ground beneath the concrete slab flooring of the buildings in which three of the samples were located, and to suggest an approximate height for the transition from alluvial clay to terrace gravels.

3.2 WS 204

Deposit Description	Approx. Height mOD	Approx. Thickness m
Concrete surface and makeup	10.34	0.30
Gravelly silt: probable 20 th century made ground	10.04	1.50
Mid orangey brown clay: alluvium	8.54	1.20
Greyish orange sandy gravel: terrace gravels	7.34	>2.00

3.3 WS 205

Deposit Description	Approx. Height mOD	Approx. Thickness m
Concrete surface and makeup	10.22	0.22
Mid brown sand-CBM mix: probable 20 th century made ground	10.00	1.78
Greyish orange sandy gravel: terrace gravels	8.22	1.80
Sand: terrace sand	6.42	>0.20

3.4 **WS 206**

Deposit Description	Approx. Height mOD	Approx. Thickness m
Concrete surface and makeup	10.49	0.30
Mid orangey grey gravely silt: probable 20 th century made ground	10.19	0.30
Mid grey clay-gravel mix: probable 20 th century made ground, possibly horticultural soil	9.89	0.60
Mid greenish grey clay: alluvium	9.29	0.80
Greyish orange sandy gravel: terrace gravel	8.49	>2.00

4 HAND-EXCAVATED TRIAL PITS

4.1 The geotechnical investigation required that three trial pits be hand-excavated against the walls of the three principle buildings on the site in order to determine the depth of the foundations. These did not require intensive archaeological supervision because the pits were excavated to a depth of between 1.20m and 1.50m, which was sufficient only to penetrate into the upper reaches of the clay alluvium at most. A general summary of the observed stratigraphy in each pit is presented here.

4.2 Hand-Excavated Trial Pit 201

The earliest deposit here was mid orangey brown alluvial clay at a height of 9.49mOD and 0.60m thick to the limit of excavation. Overlying this was 20th century made ground at a height of 10.14mOD and 0.65m thick. The foundation construction trench for the adjacent building was cut through this deposit and into the clay beneath to a level of 8.89mOD, and contained a brick-built foundation approximately 1.50m deep. The modern concrete ground surface overlying this and abutting the building's superstructure was at a height of 10.39mOD and was 0.25m thick.

4.3 Hand-Excavated Trial Pit 202

The earliest deposit in this pit was mid greyish brown sandy silt that may represent an earlier horticultural horizon. It was at a height of 10.13mOD and was 1.00m thick to the limit of excavation. The foundation trench for the adjacent building was cut through this deposit to a level deeper than 9.13mOD, where excavation of the pit was halted. The brick-built foundation within this trench rested upon a raft that extended 0.30m beyond the foundation wall face and whose upper surface was at level of 9.23mOD. Sealing the backfill of this cut was a concrete surface at a height of 10.27mOD and 0.14m thick, which abutted the superstructure of the building. This was overlain by a modern tarmac layer, likewise abutting the building, at a height of 10.33mOD and 0.06m thick.

4.4 Hand-Excavated Trial Pit 203

The earliest deposit in this pit was mid orangey brown alluvial clay at a height of 9.98mOD and 0.75m thick to the limit of excavation. Overlying this was 20th century made ground at a height of 10.33mOD and 0.35m thick. The construction trench for the adjacent building was cut through this deposit down to a level of 9.54mOD, and contained a brick-built foundation 0.90m deep that projected approximately 0.20m

beyond the plane of the wall face for the lower 0.30m of its profile. Sealing the backfill of this cut and abutting the adjacent building superstructure was a modern tarmac surface at a height of 10.43mOD and 0.10m thick.

5 CONCLUSIONS

- 5.1 Natural London clay 'bedrock' was recorded across the site rising toward the northeast from 3.84mOD at the west end of the site to 5.64mOD and 6.41mOD at the southeast and east portions of the site respectively. The overlying river terrace gravels mimic the general topographic rise from west to east. However, they are higher toward the southeast rather than the east or northeast portions of the site, rising from 6.14mOD in the west to 7.81mOD and 8.64mOD in the east and southeast respectively. This subtle shift in topography is probably due to gradual changes in the hydrodynamic conditions that shaped these deposits.
- 5.2 A layer of clay alluvium was observed across most of the site, varying in height from 8.29mOD to 9.84mOD, although most levels lie within a range from 9.00 to 9.50mOD. This broadly flat topography is due to levelling of the site in the late 19th and 20th centuries, during which it is likely that higher alluvial deposits were truncated away in the eastern portion of the site. The western area of the site is probably relatively undisturbed, as here the ground has been artificially made up above the level of the land surrounding it. Despite this previous activity, the alluvium remains a substantial deposit, often between 1.00 and 2.00m thick, and notably more than this in the west, where it reaches 3.55m at the end of the site. Only at the eastern end of the northern warehouse building has modern activity cut through the alluvium into the underlying terrace gravels. The alluvium obviously results from the past activity of the rivers Lea and Thames, but unfortunately no artefacts were recovered from within it during the investigation, and thus no firm chronology can be suggested for the formation of the deposit.
- 5.3 No features were observed cutting into the alluvium, although there are remnants of an overlying horticultural soil across the central portion of the site (Borehole 204, Trial Pits 203, 206 and 207, and Window Sample 206). It is possible that this is more widespread, but that the narrow windows provided by the borehole samples were insufficient to discern previously-worked clayey soil from silty alluvial clay. This soil was worked into the 19th century, possibly ending when the site was levelled for use as a railway goods yard in the late 19th to earlier 20th centuries. Abundant clinker in the recent made ground deposits may testify to this usage. Later still, after the goods yard had ceased operation, brick-built warehouses were erected on the eastern part of the site and much of the site was surfaced with concrete, at one point overlying an earlier cobbled surface (Borehole 206).

5.4 Although no artefacts were recovered from the earlier deposits, the investigation has established that Thames terrace gravels lie almost completely undisturbed across much, possibly all, of the site. There is therefore a good possibility that any prehistoric features cut into these gravels will have survived. Furthermore, any later activity upon the alluvium that predates the goods yard may survive in the western portion of the site where ground levelling does not appear to have been too severe.

OASIS ID: preconst1-61211

Project details

Project name	British Rail Goods Yard, Blackhorse Road, Waltham Forest
Short description of the project	Archaeological monitoring of geotechnical investigations identified a thick layer of alluvium sealed the natural gravel.
Project dates	Start: 30-05-2006 End: 06-06-2006
Previous/future work	No / Not known
Any associated project reference codes	GYW06 - Sitecode
Type of project	Recording project
Site status	Local Authority Designated Archaeological Area
Current Land use	Transport and Utilities 2 - Other transport infrastructure
Monument type	NONE None
Monument type	NONE None
Significant Finds	NONE None
Significant Finds	NONE None
Investigation type	'Test-Pit Survey'
Prompt	Direction from Local Planning Authority - PPG16

Project location

Country	England
Site location	GREATER LONDON WALTHAM FOREST WALTHAMSTOW British Rail Goods Yard, Blackhorse Road, Walthamstow
Postcode	E17 6LQ
Study area	0.90 Hectares
Site coordinates	TQ 35777 89303 51.5857116176 -0.039963571389 51 35 08 N 000 02 23 W Point
Height OD / Depth	Min: 6.14m Max: 7.84m

Project creators

Name of Organisation	Pre-Construct Archaeology Ltd
Project brief originator	GLAAS
Project design originator	Tim Bradley

Project director/manager	Tim Bradley
Project supervisor	Andrew Sargent
Type of sponsor/funding body	Willmott-Dixon Housing

Project archives

Physical Archive Exists?	No
Digital Archive recipient	LAARC
Digital Archive ID	GYW 06
Digital Contents	'none'
Digital Media available	'Database','Text'
Paper Archive recipient	LAARC
Paper Archive ID	GYW 06
Paper Contents	'none'
Paper Media available	'Context sheet','Drawing','Map','Report','Unpublished Text'

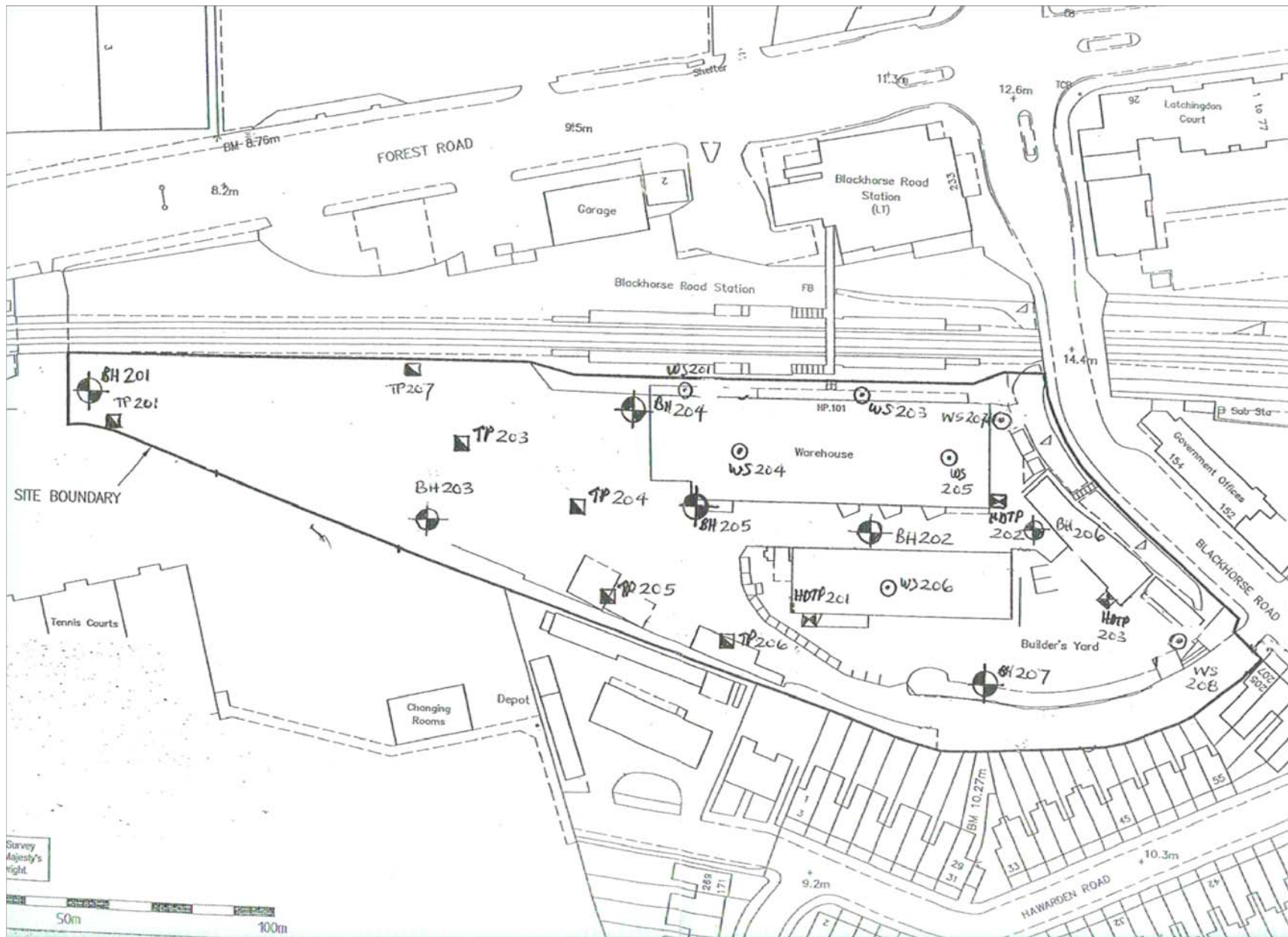
Project bibliography

1

Publication type	Grey literature (unpublished document/manuscript)
Title	An Archaeological Watching Brief at the British Rail Goods Yard, 213-215 Blackhorse Road, Walthamstow, London Borough of Waltham Forest
Author(s)/Editor(s)	Sargent, A
Date	2006
Issuer or publisher	Pre-Construct Archaeology
Place of issue or publication	London

Entered by	Helen Hawkins (hhawkins@pre-construct.com)
Entered on	25 June 2009

Figure 2 Location of Geotechnical Test Pits and Boreholes



PCA

PCA SOUTH

UNIT 54
BROCKLEY CROSS BUSINESS CENTRE
96 ENDWELL ROAD
BROCKLEY
LONDON SE4 2PD
TEL: 020 7732 3925 / 020 7639 9091
FAX: 020 7639 9588
EMAIL: info@pre-construct.com

PCA NORTH

UNIT 19A
TURSDALE BUSINESS PARK
DURHAM DH6 5PG
TEL: 0191 377 1111
FAX: 0191 377 0101
EMAIL: info.north@pre-construct.com

PCA CENTRAL

7 GRANTA TERRACE
STAPLEFORD
CAMBRIDGESHIRE CB22 5DL
TEL: 01223 845 522
FAX: 01223 845 522
EMAIL: info.central@pre-construct.com

PCA WEST

BLOCK 4
CHILCOMB HOUSE
CHILCOMB LANE
WINCHESTER
HAMPSHIRE SO23 8RB
TEL: 01962 849 549
EMAIL: info.west@pre-construct.com

PCA MIDLANDS

17-19 KETTERING RD
LITTLE BOWDEN
MARKET HARBOROUGH
LEICESTERSHIRE LE16 8AN
TEL: 01858 468 333
EMAIL: info.midlands@pre-construct.com

