GORESBROOK PARK, DAGENHAM, LONDON

AN ARCHAEOLOGICAL WATCHING BRIEF & EVALUATION

SITE CODE: OOL17

PLANNING APPLICATION NUMBER: 16/01475/FUL

LOCAL PLANNING AUTHORITY: LONDON BOROUGH OF BARKING AND DAGENHAM

PCA REPORT NO: R13080

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GORESBROOK PARK, DAGENHAM, LONDON

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Site Code:	**OOL17**
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Local Planning Authority:	**London Borough of Barking and Dagenham**
Planning Reference:	**16/01475/FUL**
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on behalf of:	**LMP DAGENHAM LTD**
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1 ABSTRACT

1.1 This report details the last two phases of archaeological investigations undertaken within the study area of Goresbrook Park in the London Borough of Dagenham in 2017. The site comprises warehouses and grounds of the Eddie Stobart Goresbrook Park Depot, which is a large storage and distribution centre.

1.2 The site is located within the Ripple Road Archaeological Priority Area as designated by the local planning authority, the London Borough of Barking and Dagenham. The archaeological potential of the site and area has been demonstrated by an investigation undertaken in 1993 at the Hays Storage Depot site, immediately to the north-east of the Goresbrook Park site. The work exposed a band of flint and gravel located within the underlying peat bed which was interpreted as a 'causeway.' Although no dateable finds were associated with the structure, carbon dating of the peat beds gave a likely Bronze Age date for the deposit. Further hand-auguring to the north of the test trenches seemed to confirm its presence and continuation to the north. A seven-phase archaeological sequence was established during the 1993 investigation.

1.3 In 2017 CgMs prepared an Archaeological Impact Assessment that incorporated information from a search through the Greater London Historic Environment Record (GLHER), a map regression exercise and included the above-mentioned borehole information. The report supported a planning application made to redevelop the site and construct a new logistics centre.

1.4 The archaeology advisers to the London Borough of Barking and Dagenham, the Greater London Archaeological Advisory Service at Historic England, required that prior to the determination of the application an investigation was undertaken to ascertain whether the causeway continued across the site. This investigation was undertaken by Pre-Construct Archaeology in April 2017, and consisted of two trenches targeted upon the projected line of the putative causeway structure. The evaluation identified and finessed the previously described seven archaeological phases but did not find a causeway, nor did it recover any dateable finds or observe any new archaeological features.

1.5 Further to the granting of planning consent, development works began initially with the installation of expansive below ground drainage beneath a large area of proposed hard-standing. This work was monitored by PCA as a watching brief in June and July 2017. The work included excavations for new attenuation tanks, drainage runs and manholes. Generally these only extended to a maximum depth which exposed the peat horizon recorded during previous investigations.

1.6 In July 2017 QUEST carried out a borehole survey of the site, the data from which was combined with other datasets from the surrounding area to create a deposit model and provide further information on the palaeo-environment of the site at the time of the formation of the peat beds and underlying sediments (lower alluvium). This identified an

area of higher gravel in the northern part of the site, where a new logistics warehouse was to be built as part of the redevelopment.

1.7 In September 2017, PCA returned to the site in advance of the works to construct the new warehouse. The brief was to execute two evaluation trenches; however severe ground contaminants, thicknesses of made ground and groundwater prevented this work. Instead seven test pits were excavated under archaeological supervision; the work revealed further evidence for the seven-phase archaeological sequence established in 1993, but exposed no significant archaeological remains.

1.8 Modern activity does not appear to have significantly truncated the underlying archaeological resource; however, a number of drain runs were recorded as well as some areas of large concrete intrusions which in some cases penetrated to the depth of the peat. However, this truncation was localised.

1.9 The investigations have therefore shown a palaeo-environmental / ground sequence of:

- Phase 1 represents the underlying Palaeolithic gravel formation
- Phase 2 represents the probable Mesolithic sandy clay alluvial layer
- Phase 3 represents the Neolithic to the Early Bronze Age peat formation
- Phase 4 represents the Middle Bronze Age peat formation
- Phase 5 represents the Late Bronze Age to Iron Age sandy clay alluvial layer
- Phase 6 represents the post-medieval made ground layer
- Phase 7 represents the modern concrete and associated hardcore.

1.10 No evidence for archaeological features or finds has been observed.

2 INTRODUCTION

2.1 A series of archaeological interventions have been undertaken by Pre-Construct Archaeology Limited at Goresbrook Park, Dagenham, Greater London, occupied by warehouses and grounds of the Eddie Stobart Goresbrook Park Depot. The study site comprises two large rectangular warehouses (Units 4 and 5), HGV parking, a Traffic Office, Refuel Station, and Vehicle Maintenance Unit, with associated access roads and hard standing. The site is centred at NGR TQ 48432 83233 and covers an area of approximately 5.30ha (Figures 1 and 2).

2.2 The site is located within the Ripple Road Archaeological Priority Area as designated by the local planning authority, the London Borough of Barking and Dagenham.

2.3 This report details the results of a watching brief undertaken during the installation of widespread drainage in the southern area of the site, and a watching brief undertaken during a test pit survey in the northern part of the site where a new warehouse shed will be located. This work was completed in response to the recommendations of the Greater London Archaeological Advisory Service (GLAAS) at Historic England. GLAAS had previously required that, prior to the determination of the planning application, an evaluation was undertaken to ascertain whether a Bronze Age causeway which had been identified in 1993 at a site immediately north of Goresbrook Park extended into and across the subject site. The pre-determination evaluation was completed by PCA in April 2017 and is reported elsewhere (Reade 2017). It was able to identify seven phases but the causeway was not found, nor were any dateable finds or features (Reade 2017).

2.4 Between the phases of work herein reported, the client's archaeological consultant at CgMs Consulting commissioned Quaternary Scientific (QUEST), from the University of Reading, to execute a borehole survey and produce a deposit model for the site (Young 2017).

2.5 The planning application for redevelopment of the site, reference 16/01475/FUL, was supported by an Archaeological Impact Assessment by CgMs Consulting (Archer 2017); it concluded that there was a high archaeological potential for the Bronze Age period with particular potential for the presence of the 'causeway' which had been identified immediately to the north and was projected to run into the south/south east area of the site.

2.6 The archaeological works described within this report were undertaken in between June and July 2017 (the drainage watching brief, supervised by Przemek Polikiewicz and Kalliopi Themeli) and in September 2017 (the test pit survey, supervised by Guy Seddon). The works were commissioned by CgMs Consulting on behalf of LMP Dagenham Ltd. The work was undertaken in accordance with an approved Written Scheme of Investigation (Mayo 2017a, b) and following Historic England guidelines (GLAAS 2015). The work was monitored by Adam Single, GLAAS, Archaeology Advisor

to the London Borough of Barking and Dagenham.

2.7 The completed archive comprising written, drawn, and photographic records and artefacts will be deposited with the London Archaeological Archive and Research Centre (LAARC).

2.8 This report revisits the previous archaeological work on and near the site to place the result of the recent work in context.

2.9 The site archive was recorded using the unique site code OOL17, which was originated prior to the first phase of evaluation by PCA in 2017.

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 27th 2012, and now supersedes 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 Plan policy and by other material considerations.

3.2 Regional Policy: The London Plan

3.2.1 The relevant Strategic Development Plan framework is provided by "The London Plan, Spatial Development Strategy for Greater London Consolidated with Alterations since 2011" (March 2016). It includes the following policy relating to archaeology within central London:

Policy 7.8 Heritage Assets and Archaeology

POLICY 7.8 HERITAGE ASSETS AND ARCHAEOLOGY

Strategic

A London's heritage assets and historic environment, including listed buildings, registered historic parks and gardens and other natural and historic landscapes, conservation areas, World Heritage Sites, registered battlefields, scheduled monuments, archaeological remains and memorials should be identified, so that the desirability of sustaining and enhancing their significance and of utilising their positive role in place shaping can be taken into account.

B Development should incorporate measures that identify, record, interpret, protect and, where appropriate, present the site's archaeology.

Planning decisions

C Development should identify, value, conserve, restore, re-use and incorporate heritage assets, where appropriate.

D Development affecting heritage assets and their settings should conserve their significance, by being sympathetic to their form, scale, materials and architectural detail.

E New development should make provision for the protection of archaeological resources, landscapes and significant memorials. The physical assets should, where possible, be made available to the public on-site. Where the archaeological asset or memorial cannot be preserved or managed on-site, provision must be made for the investigation, understanding, recording, dissemination and archiving of that asset.

LDF preparation

F Boroughs should, in LDF policies, seek to maintain and enhance the contribution of built, landscaped and buried heritage to London's environmental quality, cultural

identity and economy as part of managing London's ability to accommodate change and regeneration.

G Boroughs, in consultation with English Heritage, Natural England and other relevant statutory organisations, should include appropriate policies in their LDFs for identifying, protecting, enhancing and improving access to the historic environment and heritage assets and their settings where appropriate, and to archaeological assets, memorials and historic and natural landscape character within their area.

3.3 Local Policy: Archaeology in the London Borough of Barking and Dagenham

3.3.1 The relevant local policy is provided by the Barking and Dagenham Local Plan, which was adopted in July 2010. It contains the following policy statement with regards to the Historic Environment:

POLICY CP2: PROTECTING AND PROMOTING OUR HISTORIC ENVIRONMENT

Barking and Dagenham has a rich local history. Signs of our fishing, maritime and industrial heritage can still be seen for example at Barking Town Quay, the Ford works in Dagenham, and the Malthouse and Granary buildings on Abbey Road. The Becontree Estate, the Curfew Tower and remains of Barking and Abbey, Eastbury Manor House, Valence House and Dagenham Village are also important symbols of our past.

However, compared to many other areas the Borough has relatively few protected historic environment assets such as listed buildings and conservations areas. With this in mind the Council will take particular care to:

- Protect and wherever possible enhance our historic environment.
- Promote understanding of and respect for our local context.
- Reinforce local distinctiveness.
- Require development proposals and regeneration initiatives to be of a high quality that respects and reflects our historic context and assets.

3.4 Planning Permission

3.4.1 Planning permission for the redevelopment of the site has been granted by the PLA under application number 16/01475/FUL. The application is for the 'demolition of Units 4 and 5, erection of new warehouse building adjacent to Unit 1 to provide 16,908sqm of floorspace (GIA) and relocation of existing traffic office, vehicle maintenance unit building, and HGV parking.'

3.4.2 Two archaeological conditions are attached to the consent, as follows:

23) No demolition of development shall take place until a stage 1 detailed impact assessment has been submitted to and approved by the Local Planning Authority in writing. For land that is included within the Written Scheme of Investigation (WSI), no demolition or development shall take place other than in accordance with the agreed WSI, and the nomination of a competent person(s) or organisation

to undertake the agreed works.

Reason:

Archaeology must be identified prior to the commencement of development to ensure that archaeological investigation is initiated at an appropriate point in the development process and that any areas of archaeological preservation are identified and appropriately recorded/preserved in accordance with Policy BP3 of the Borough Wide DPD (March 2011).

24) Where specific impacts have been identified by the modelling and evaluation assessment report in stage 1, a further stage 2 Conservation Management Plan for the mitigation of those impacts through preservation in-situ, including foundation design and the scientific monitoring of the agreed methodologies, shall be submitted to and approved by the Local Planning Authority in wirting. For land that is included within the stage 2 WSI, no demolition/development shall take place other than in accordance with the agreed stage 2 WSI which shall include:

A. The statement of significance and research objectives, the programme and methodology of site preservation and the nomination of a competent person(s) or organisation to undertake the agreed works;

B. The programme for post-investigation assessment and subsequent analysis, publication & dissemination and deposition of resulting material. This part of the condition shall not be discharged until these elements have been fulfilled in accordance with the programme set out in the stage 2 WSI.

Reason:

Archaeology must be identified prior to the commencement of development to ensure that archaeological investigation is initiated at an appropriate point in the development process and that any areas of archaeological preservation are identified and appropriately recorded/preserved in accordance with Policy BP3 of the Borough Wide DPD (March 2011).

3.4.3 Condition 23 has been addressed by the Archaeological Impact Assessment (AIA) (Archer 2017) and first evaluation (Reade 2017).

3.4.4 Consultation between CgMs Consulting and GLAAS led to a requirement for the drainage groundworks at the site to be monitored under watching brief conditions, and the area of the proposed new warehouse to be investigated by a trial-trench evaluation; this work was designed in an approved Written Scheme of Investigation (Mayo 2017b).

3.4.5 This document forms the post investigation assessment of the archaeological work, as defined above.

3.5 Evaluation Objectives

3.5.1 The Written Scheme of Investigation (Mayo 2017) highlighted the following research objectives:

- To establish whether the causeway found to the east continues into the site.
- If present, to confirm its state of preservation.
- To ascertain whether archaeological remains of the prehistoric period are present.
- To establish the presence or absence of palaeo-environmental remains and, if present, assess their potential to contain yield information about the former environment of the site and / or human activity in the vicinity;
- To establish the presence or absence of archaeological remains of any other period, and allow the design of a suitable mitigation strategy if appropriate;
- To establish the extent of all past post-depositional impacts on the archaeological resource.

4 GEOLOGY AND TOPOGRAPHY

4.1 The British Geological Survey records the solid geology of the study site as primarily London Clay Formation (Clay, Sit and Sand) with the Lambeth Group (Clay, Silt and Sand) occupying the far southeast corner of the study site. Superficial deposits are recorded throughout the study site as Alluvium (Clay, Silty, Peaty, Sandy) with Taplow Gravel Formation (Sand and Gravel) running across the northwest boundary (BGS online 2017).

4.2 The 1993 investigation (site code DA HS 93) in the north-east corner of the of the site in the Hays Storage Services area first recorded the sequence of natural deposits (below the made ground and 20th century concrete surfaces) in which an upper alluvial layer sealed a peat bed which in turn lay on sands and silts (the lower alluvial layer). It was within the formation of the peat bed that a deposit of burnt flint and gravel was first discovered (Divers 1996).

4.3 This geology sequence was confirmed by successive geotechnical investigations of the site which recorded made ground to a maximum depth of 3.90m below ground level (bgl), though typically encountered at depths of c. 2.4m –3.0m bgl. Underlying the made ground were alluvial deposits comprising an upper strata of clay above horizons of peat which in turn seal sand/silts. Peat deposits were generally identified between 2.40m and 5.70m bgl, though BH03 recorded peat at 1.80m bgl. The highest horizons of peat occur in the west of the study site at -0.90m OD. This may indicate a location of higher gravels during the period of peat formation and therefore a possible focus for prehistoric activity. Below the peat deposits, Kempton Park gravels were observed between c. 5m and 6m bgl, with London Clay identified below this (Archer 2017).

4.4 The first evaluation undertaken on the site by PCA in 2017 recorded the same sequence of deposits, as follows:

Stratigraphic Layer	DA HS 93			OOL17		
	Phase	Approx. Level (m OD)		Phase	Approx. Level (m OD)	
		Max	Min		Max	Min
Gravel	Not Recorded			Phase 1	-4.66	
Alluvial Sandy Clay/Silt	Phase 1	-2.33	-3.09	Phase 2	-2.02	-2.51
Peat with timber horizon	Phase 2	-1.98	-2.80	Phase 3	-1.60	-2.00
Causeway	Phase 3	-1.63	-1.72	Not Recorded		
Peat	Phase 4	-1.56	-1.66	Phase 4	-0.82	-1.08
Alluvial Clay	Phase 5	-0.35	-1.55	Phase 5	-0.60	-0.78
Soil Horizon/ Made Ground	Phase 6	-0.40	-1.10	Phase 6	0.00	-0.72
Modern Ground Surface	Phase 7	0.55	0.31	Phase 7	1.05	0.73

4.5 The modern ground level is relatively flat, lying between 0.73m – 1.05m OD, with variations predominantly due to artificial sloping of the concrete/tarmac surface rather than natural topography (Reade 2017: 12).

5 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

5.1 The full archaeological and historical background is given in the Archaeological Impact Assessment (Archer 2017) and the most pertinent points to the evaluation summarised below (taken from the Written Scheme of Investigation (Mayo 2017a,b).

5.2 A linear spread of burnt flint and gravel oriented NNE/SSW was found during an investigation conducted in 1993 at the Hays Storage Depot in the north-east of the site. It was associated with the underlying peat beds that had extended southwards towards the Thames during a drop in sea level during the Bronze Age. The deposit of flint and gravel was 4m in width and at least 20-23m in length. It was interpreted as a causeway – and it is this structure which has been principally the subject of the successive investigations. It was dated to the Bronze Age, a date implied from radiocarbon dates retrieved from the peat beds. It has been suggested that it may have been in use for over 100 years between 1520 and 1400 BC. Its surface was recorded at a height of -1.70m OD within the upper level of a peat deposit (Divers 1996: 12). The level of the top of the peat beds was confirmed by the two boreholes (QBH 1 & 2) undertaken by QUEST in 2017 and for the most part appear to be fairly consistent (if undulating) on the horizontal plane, and untruncated (Young 2017).

5.3 The AIA concluded that “the study site is considered to have a high archaeological potential for the Bronze Age period with particular evidence for the Bronze Age causeway a possibility. A low archaeological potential is identified for all other past periods” (Archer 2017).

5.4 The AIA report included site records from numerous geotechnical investigations which had been completed at the site. Within one of these, WS113 completed in September 2014, GLAAS considered that potential evidence may have been found for the causeway continuing (Reade 2017:13).

5.5 The evaluation carried out by PCA targeted upon the projected line of the causeway did not identify the feature. The investigations revealed a sequence modern made ground, underlain by sandy gravel, alluvium, peat and a further alluvial horizon in sequence. Within the peat horizon were numerous horizontal timbers and visible rooting. These, although middle Bronze Age in date, were considered naturally deposited and representative of a felled tree along the former flood plain (Reade 2017, Appendix 3).

5.6 Borehole evidence had shown that the highest horizons of peat occur in the west of the study site at -0.90m OD which may indicate a location of higher gravels during the period of peat formation and therefore providing a focus for prehistoric activity (Mayo 2017b:4)

5.7 Further boreholes by QUEST confirmed that the sediments present beneath the site are similar to those recorded elsewhere in the Lower Thames Valley. The Shepperton Gravel is overlain by a sequence of Holocene alluvial sediments, including peat buried beneath modern made ground. These sediments are considered to have the potential to contain a

wealth of further information on the past landscape (QUEST 2017: 28).

5.8 One of the boreholes put down by QUEST in the southeast corner of the site, QBH2, recorded a sequence which included a charcoal fragment within the peat horizon (equating to Phase 4 as outlined above). The borehole also hit an obstruction below or within the peat which was recorded as a 'Large wood branch/timber. Not possible to core beyond 5.00m bgl.' (QUEST 2017: 16). The wood was first struck at 4.34m bgl, -3.16mOD.

6 METHODOLOGY

6.1 Intermittently between 5th June and 31st July 2017 a watching brief was undertaken during the excavation of a large attenuation tank and its associated manholes and attendant pipework along the southern area of the site (Figure 2). The attendant archaeologist monitored widespread excavations which extended to varying depths, generally being contained only within made ground horizons but in isolated places penetrating deeper to the base of the lower alluvium. Recording was concentrated in those areas where the deeper sequence was exposed. Conditions were far from ideal: the made ground was significantly contaminated and of poor structural stability, and groundwater ingress was significant.

6.2 From 25th-28th September 2017 PCA completed a test-pit survey of the northern area of the site, where the new warehouse structure is to be sited. The methodology within the approved WSI (Mayo 2017b) was that two trenches each measuring 20m by 1.8m at base were to be excavated, to a maximum depth of 2.4m BGL, but augmented by deeper test pits within each trench to expose the underlying stratigraphy. However, the deposit model (Young 2017) and a geotechnical site investigation (Peter Brett Associates 2016) implied that the thickness of made ground was such that a trench depth of 2.4m may not expose underlying deposits. Therefore the WSI designed that each proposed evaluation trench would be initiated by a deep test pits at each end of each trench; if this exposed made ground below 2.4m then the larger trench would not be excavated.

6.3 This test-pit approach did indeed reveal made ground to 2.4m or more at the terminal ends of both trenches. Furthermore, the made ground was constantly susceptible to collapse, worsened by constant water ingress. On this basis the proposed larger trenches were not undertaken.

6.4 Instead, and at the request of Adam Single of GLAAS, some additional test pits were executed at locations thought to be favourable for high gravel. Three further pits were cut, all of which displayed the same problems of instability, water ingress and made ground of 2.4m thick or more. Visible and olfactory evidence of ground contaminants was visible throughout all the test pits.

6.5 The test pits were all generally around 2m by 2m at ground level, achieved depths as shown below. Once excavated and recorded, they were immediately backfilled.

Test Pit ID	Max depth	Test Pit ID	Max depth
TP 1	2.5m BGL	TP 5	2.5m BGL
TP 2	3.3m BGL	TP 6	3.0m BGL
TP 3	3.0m BGL	TP 7	3.0m BGL
TP 4	3.0m BGL		

6.6 Test Pit 5 was noteworthy for the discovery of suspected buried ordinance at 2.5m BGL.

Upon the enaction of emergency procedures and its inspection by qualified EOD engineers, the item was identified as a discarded gas canister – attesting to the modernity of the made ground in this area.

6.7 All phases of works followed CIfA guidelines and the methodologies set out in Historic England (GLAAS) Guidance Papers for standards and practices in archaeological fieldwork.

6.8 The complete Site Archive, including all material generated electronically during post excavation, and artefactual material for retention will be packaged for long term curation. In preparing the Site Archive for deposition, all relevant standards and guidelines documents referenced in the *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) will be adhered to. The depositional requirements of the body to which the Site Archive will be ultimately transferred will be met in full; for this project, the repository which is expected to take custody of the archive is the London Archaeological Archive and Research Centre (LAARC).

7 ARCHAEOLOGICAL PHASE DISCUSSION

The following table summarises the palaeo-environmental and archaeological sequences recorded during the various investigations on or adjacent to the Goresbrook Park site. Strata equating to Phases 1-3 were not observed during the recent works by PCA.

Site:	**Hays Storage Depot (DA HS 93)**	**Goresbrook Park OOL17**		
Contractor:	Newham Museum Service	Pre-Construct Archaeology Limited		QUEST
Investigation:	Evaluation 1993 (Divers 1996)	Evaluation May 2017 (Reade 2017)	WB June-July 2017 and TP survey September 2017	Borehole Survey
Archaeological Phase:				
1 *OD heights*		Palaeolithic gravel formation *-4.66m OD*		Gravel and Sand *Generally -3.0m to -4.5m OD*
DA HS 93 Phase 1 **OOL17 Phase 2** *OD heights*	Sandy silt (lower alluvium) ? – 3990 BC *Approx. -3.00m OD*	Mesolithic Sandy clay (lower alluvium) *-2.02m to -2.51m OD*		Predominantly silty or clayey (lower alluvium) *-2.0m to -3.5m OD*
DA HS 93 Phase 2 **OOL17 Phase 3** *OD heights*	Neolithic to BA peat formation c.3990 BC – 1520 BC *-1.78m to -1.80m OD*	Neolithic to EBA peat formation *-1.6m to -2.0m OD*		Wood deposit *-3.16m to -3.82m OD*
DA HS 93 Phase 3 *OD heights*	Bronze Age flint & gravel deposit (causeway structure) c.1520 BC – 1400 BC *-1.61m OD*			
4 *OD heights*	Late Bronze Age peat formation c.1400 BC – 1000 BC *-1.65m to -1.68m OD*	Middle Bronze Age peat formation *-0.82m to -1.08m OD*	Peat formation *-0.9m to -1.54m OD*	Peat formation, late Mesolithic to Bronze Age *-1.0m to -2.0m OD*
5 *OD heights*	Late Bronze Age Alluvial clay (upper alluvium) c.1400 BC - ? *Approx. -1.0m OD*	LBA to IA sandy clay (upper alluvium) *-0.60 to -0.78m OD*	Upper alluvium *-0.57m to -1.05m OD*	predominantly silty or clayey, very occasionally organic-rich (upper alluvium) *-1.5m to -2.0m OD*
6 *OD heights*	Post medieval soil horizon	Post medieval made ground layer	Post medieval Made ground layer *0.0m to -0.7m OD*	Made Ground *+2.41 to -0.82*
7 *OD heights*	Modern concrete & made ground *+0.69m to +0.39m OD*	Modern concrete & made ground *Approx. +0.85m to +1.0m OD*	Modern Concrete & made ground *+1.0m to +1.89m OD*	

7.1 **Phase 4: Middle – Late Bronze Age c.1520 BC – 1400 BC & 1400 BC – 1000 BC: peat formation and burnt flint deposit (or causeway).**

7.1.1 It was in this phase that a deposit of gravel, burnt flint fragments and sand (context [104]) measuring 4m wide and up to 0.25m thick was uncovered within the peat sequence at around -1.61m OD on the adjacent site. It was described as having been 'dumped' and not naturally deposited. It had an uneven surface and sloped down towards the west. Radiocarbon dates of the peat directly above and below this deposit gave a *terminus post quem* of c.1520 cal BC and a *terminus ante quem* for its disuse as 1400 cal BC. It was suggested that the deposit, if used as a causeway, was in use for over one hundred years (Divers 1996: 6).

7.1.2 No sign of the flint and gravel deposit was seen in Trench 1 of the May 2017 excavation although a concentration of wood was examined to see if it constituted a wooden causeway as detailed above. The absence of the flint deposit suggested that its southern limit of the was either further to the north or, if it was indeed a linear deposit, its course may have diverted elsewhere or utilised sand/gravel banks for its course. It was noted that higher peat levels to the west (c.-0.90m OD) may suggest higher underlying gravels (Mayo 2017b:4). The causeway may have taken a turn to the west to attain this gravel bank/eyot.

7.1.3 Peat growth however, continued in this phase and its upper levels are recorded as being at between -0.82m and -1.08m OD during the May 2017 evaluation which noted that no evidence for human activity was found (Reade 2017: 17).

7.1.4 Both the investigations in June and September 2017 exposed the top of the peat layer. In June it was recorded as being at its highest in TP 104 at -0.90m OD and lowest at -1.54m OD in TP 107. During the work in September 2017 it was recorded as being at its highest at -1.11m OD in TP 1 and at its lowest at -1.42m OD in TP 2.

7.1.5 No evidence for human activity was found within this phase in either of these latter investigations.

7.2 **Phase 5: Late Bronze Age 1400 cal BC - ?: upper alluvium**

7.2.1 Phase 5 comprises an alluvial sandy-clay layer above the peat formation recorded at a height of c.-1m OD in 1993 (Divers 1996:7) and between -0.60 to -0.78m OD in May 2017, where it was recorded as being between 0.18m to 0.44m thick (Reade 2017:18). Both the investigations later in 2017 exposed the top of this upper alluvial deposit: it was recorded at its highest at -0.96m in TP 102 and lowest at -1.05m OD in TP 107 in June 2017. Meanwhile, during operations in September 2017 it was recorded at its highest in -0.57m in TP 1 and lowest at -1.16m OD in TP 7. The peat sealed below this level gave a *terminus post quem* of 1400 cal BC (Divers 1996:6).

7.2.2 No evidence for human activity was found within Phase 5.

7.3 **Phase 6: Post Medieval (c.19th Century): soil horizon & made ground layers.**

7.3.1 Phase 6 comprises the made ground silt layer or mixed subsoil layer which overlay the alluvial clay and is not securely dated. A fragment of ceramic clay tobacco pipe was found

during the 1993 excavations which dated to the 19th century (Divers 1996: 7) and a post-medieval ceramic drain was recorded in Trench 2E at a height of -1.40m OD. The drain ran at a slight east-northeast to west-southwest angle with the cut visible from a height of -0.76m OD to -1.70m OD at base, and was approximately 1.00m wide (Reade 2017: 18).

7.3.2 The horizon was recorded as a subsoil [82] in TP 107 at 0.00m OD and -0.70m OD in TP 105 during the drainage watching brief, although it is likely to be re-deposited soil in both instances and the differences in height is a result of later truncation. It was not seen during the September 2017 test pits.

7.4 Phase 7: Modern

7.4.1 Phase 7 is largely comprised of the concrete and tarmac slabs and surfaces with associated hardcore aggregates and underlying made ground. The 1993 excavation recorded it at its highest at 0.69m OD and lowest as 0.39m OD. In the May 2017 evaluation Trench 1 recorded an uppermost tarmac ground surface at between 0.73m to 0.94m OD that was approximately 0.16m thick. In Trench 2 two reinforced concrete slabs were recorded at 0.97m OD in the west and 1.05m OD in the east with a thickness of approximately 0.20m. During the June 2017 watching brief modern ground levels were at 1.26m OD at the highest point and 1.00m OD at the lowest. Further north in the area covered by the test pits in September 2017, the modern ground level was a little higher at levels between 1.89m OD and 1.82m OD. In all cases the layers related to the levelling and preparatory work associated with the establishment of Goresbrook Park. The made ground in some locations contained concrete debris considered to derive form the demolished 20th century greyhound race track (Reade 2017: 19).

Plate 1: Section 5, view east showing new manhole excavation through made ground, to Phase 4 peat

Plate 2: View north of E-W drainage trench showing excavation through made ground and upper alluvium to Phase 4 peat

Plate 3: Example of made ground and ground water conditions

Plate 4: View east of attenuation tank area, showing excavation through made ground to Phase 5 upper alluvium

Plate 5: View of area of contamination, often seen across site

Plate 6: TP1: 2.5m of made ground, onto 0.75m of alluvial clay onto 0.30m+ of peat. All heavily contaminated. TP aborted due to water ingress.

Plate 7: TP2: 2.50m of made ground onto 0.80m of alluvial clay onto top of peat at 3.30m BGL. Substantive water ingress at that depth so TP was aborted

Plate 8: TP3: 2.70m of made ground onto 0.30m+ alluvial clay. TP then started to collapse, was aborted at 3m

Plate 9: TP4: 2.70m of made ground onto 0.30m+ alluvium. TP then started to collapse, was aborted at 3m

Plate 10: TP5: Suspected UX observed in made ground at 2.5m BGL. EOD Engineer advised it was actually a gas canister. TP aborted at 2.5m BGL

Plate 11: TP6: Made ground continues below 3.0m BGL at which point collapse meant the pit had to be aborted.

Plate 12: TP7: 2.70m made ground onto 0.30m+ alluvium. Trench started to lose integrity at 3m so aborted prior to collapse.

8 RESEARCH OBJECTIVES

8.1 The original research objectives and questions contained within the Written Scheme of Investigation can now be addressed as follows:

To establish whether the causeway found to the east continues into the site.

8.2 No evidence for the causeway was recorded within the evaluation of May 2017, nor during recent watching briefs of June/July 2017 and September 2017.

8.3 As the recent investigations were somewhat limited in scope the best evidence comes from the May 2017 two-trench evaluation which attempted to target the projected line of the putative causeway. The similarities within the stratigraphic sequence and the layers of peat and alluvium recorded suggest little variation between the original Trench 2 in 1993 and the new Trench 1 in the May evaluation. It concluded that if the causeway was to have continued along the projected route, then it would have been located between phases 3 and 4 identified at Goresbrook Park (Reade 2017: 20).

8.4 Due to the lack of dateable finds during the 1993 evaluation and lack of any 'structure' of the type one would normally expect from Bronze Age causeways (horizontal planks or logs lashed or pegged to vertically-driven posts) the interpretation of the burnt flint deposit as a 'causeway' perhaps requires reconsideration. Reade has already suggested that the deposit may have in fact been a burnt mound; this type of monument is already known from the East London area, and the low frequency of burnt flint and its substantive size (in excess of 4m x 20m) may support this theory (Reade 2017:21).

8.5 Burnt Mounds are described by Historic England as being a dump of burnt stones interspersed with charcoal deposits; many of the stones of which will have become too fractured for future use. Interpretations are divided between them being either places for ritualised cooking or the remains of a sweat lodge or sauna, the latter of which is supported by ethnographic evidence. Examples are quoted as reaching up to 15.5m in diameter (Historic England online 2011). They have also been described as having been created by a series of 'depositional events' and as such should be seen as the by-product of human technology (Gardner 2014). The concept of these monuments forming over long periods is supported by Barfield and Hodder (1987: 371) who suggest that the large quantities of stone indicate the use of the site(s) over a long period of time. It has been suggested that research has focussed too much on the mound itself as opposed to its environs - which may be hampering our understanding of them (Gardener 2014). However, the 'classic' burnt mound is one which is found in close association with a watercourse (or palaeochannel), a nearby hearth (for heating the stones) and a 'trough' (sometimes wood-lined) which once held water to either cook or create steam depending upon the interpretation (Historic England online 2011). Recent work has included five burnt mound sites excavated in the East Midlands. Whilst each site possessed one or more of the above diagnostic features there was a marked variation from site to site. In

particular, a mound at Willington, Derbyshire (although Neolithic as opposed to Bronze Age) was described as a crescentric mound *'partly skirted by a metalled approach.'* Summarising the data, the author concluded that the structures identified in association with the mound included a bridge, an area of hard-standing and a metalled surface – the latter being particularly pertinent considering the deposit in question. It was suggested that investment in such structures indicated the repeated activity by a number of people and even suggested a ceremonial aspect to burnt mound creation (Beamish & Ripper 2000:37). Taking the above into account, the Goresbrook example would be unusual in that it is sited within the peat beds as opposed to on a raised gravel mound or eyot and lacks both the hearth and trough features which are crucial to the functioning (and identification) of such a monument.

8.6 As mentioned above metalled surfaces or trackways during the period are not unknown, but are uncommon. Most causeways across marshes are constructed of wood, the most famous of these being the wooden-planked Sweet Track in the Somerset Levels discovered by a local peat cutter Ray Sweet in 1970 (SWHT online HER 2017) and the trackways at Flag Fen which consisted of a wooden causeway about 1km long. The former actually dates to the Neolithic and the latter in located in east England but which is Bronze Age, dating to c.1500 BC (HE online 2017b).

8.7 In the 1993 report the author lists a number of wooden trackways in the area of the study site dating to the Bronze Age, for example one to the west in Beckton in the London Borough of Newham and one to the east on Rainham Marshes in the London Borough of Havering. He also cites brushwood and stake constructions at Highbridge Road, Barking, as well as a trackway constructed from 'substantial' timbers at Fort Street, Silvertown; all sites are provisionally dated to the Middle Bronze Age (c.1500-1100BC) (Divers 1993:3). At the Rainham site, the second phase of activity included spreads of fire cracked pebbles which may have related to domestic cooking activities on the foreshore. However, the trackway itself was of brushwood and not enhanced in this instance by metalling from burnt flint (Meddens & Beasley 1990: 242). To conclude, a burnt flint causeway wold be rare if not unique. For the moment therefore, a burnt mound (or the remains of one washed in from elsewhere) is a more likely explanation.

8.8 To ascertain whether archaeological remains of the prehistoric period are present. No archaeological remains that may have been associated with the causeway or the prehistoric period were observed.

To establish the presence or absence of palaeo-environmental remains and, if present, assess their potential to yield information about the former environment of the site and/or human activity in the vicinity.

8.9 The recorded peat and alluvial deposits are believed to have a high potential to yield information about the former environment of the site. In particular it is believed that it adds substantially to the corpus of evidence for reconstruction of the later prehistoric

landscape (QUEST 2017: 28).

8.10 The results of the new geoarchaeological investigations and subsequent deposit modelling indicate that the sediments present beneath the site are similar to those recorded elsewhere in the Thames Valley. The Shepperton Gravel is overlain by a sequence of Holocene alluvial sediments including peat buried beneath the modern made ground. The surface of the Shepperton Gravel generally rests between -3m OD to – 4.5m OD across the majority of the site rising to -2m OD on the northernmost part of the site, representative of the Taplow Gravel terrace and floodplain edge. The gravel is overlain by a tripartite sequence of Lower Alluvium, Peat and Upper Alluvium. The peat ranges between 1 and 2m in thickness (QUEST 2017: 28).

8.11 The recent boreholes put down by QUEST (2017) included one, QBH2, which hit a deposit of wood extending from -3.16m OD to -3.82m OD, but could not be penetrated further. A comparable layer of peat with large wooden timbers was recorded in the Hays Storage Services excavations: 'Group 14' was similarly characterised as 'several fallen trees found lying randomly in a layer of peat (context 134)' which were the remains of alder woodlands. The surface of Group 14 was recorded by Divers at around -2.40m OD. None of the trees showed signs of being worked, but two were heavily burnt at one end leading to a hypothesis of being burnt from a lightning strike or forest fire (Divers 1996, 23). It is interesting to consider this with comparison to the sequence recorded by QUEST in QBH2, which identified a 'Charcoal fragment (20x20mm) at -2.86 to -2.88m OD' (QUEST 2017 16), as a fire at the site could account for the burnt remains / charcoal.

8.12 The presence of fallen trees across the Goresbrook Park site is further seen from the evidence within OOL17 evaluation Trench 1, within which a natural deposit of carr woodland trees and branches was found at approximately -2.0m OD.

To establish the presence or absence of archaeological remains of any other periods, and allow the design of a suitable mitigation strategy if appropriate

8.13 No artefacts or features dating to other periods were recorded apart from post-medieval drain uncovered during the investigations of May 2017. Modern archaeological remains may have also been encountered in Trench 1 of that evaluation in relation to the mid-20th-century greyhound stadium in the form of demolition debris. This attribution is, however, uncertain and the remains, which have already been damaged from the process of demolition, are not *in situ* (Reade 2017: 22).

To establish the extent of all past post-depositional impacts on the archaeological resource.

8.14 In Trench 1 of the 2017 evaluation large concrete blocks and pillars which were likely demolition debris from 20th-century activity were recorded to a maximum depth of -1.20m OD (approximately 2m bgl), which truncated through the upper alluvial sandy clay layer

and into the underlying peat formation (Reade 2017: 23). A similar pattern of discreet modern truncation into the upper alluvium and peat deposits was observed during the drainage watching brief.

8.15 The recent test pit survey has demonstrated the presence of substantive thicknesses of contaminated made ground, as was concluded by the geotechnical site investigation (Peter Brett Associates 2016). The made ground is variously of modern origin or has been subject to significant disturbance on the modern period probably during the late 20th century developments. A decisive example of this was the discovery of a gas canister at a depth of 2.5m within TP5.

9 CONCLUSIONS

9.1 From the recent watching brief and test-pitting survey completed at the site, only 6 of the monitored interventions exposed the top of the Phase 4 peat layer, and it was not fully penetrated anywhere on site. In both phases the ground conditions (including ingress of ground water, contamination and trench collapse) prevented access to the trenches to investigate them by hand; however nowhere was this felt to be necessary had it been possible. No evidence of the deposit of burnt flint (or possible causeway) was apparent in any location monitored.

9.2 The evaluation completed in May 2017 showed that the causeway found to the north in 1993 did not continue south into the study site along the projected route. The similarities within the stratigraphic sequence between the May 2017 evaluation and the Hays Storage Solutions investigations in 1993 suggest that if the causeway were to have been present within the Goresbrook Park site it would have been visible had it extended along the projected line, as no significant post-depositional impacts were recorded on this route (Reade 2017: 23).

9.3 Of the two additional archaeological investigations no evidence for a prehistoric settlement or reason for the termination of the causeway was found. Reade postulates that the higher elevation of the alluvial sequence in the evaluation trenches to the south and in the DA HS 93 Trench 1 to the west, compared to that surrounding the causeway, suggests that an area of activity may be focused around a localised depression in the landscape rather than leading further south across the entirety of the flood plains. In this case, the causeway would have been constructed purely to cross a lower, wetter area of peat bog (Reade 2017:23). The idea of a natural ‘depression’ once again opens the idea that the material was somehow moved to its location either by fluvial action or the downward movement of material by gravity.

9.4 No evidence of in situ archaeology has been observed through the archaeological works in 2017. They have, however re-affirmed the seven phases of palaeoenvironmental and archaeological land-forming processes whilst also demonstrating the significant ground contaminants present within the made ground horizons.

9.5 Once the project is deemed complete and this report approved by GLAAS on behalf of the local planning authority, the completed archive comprising all site records from the fieldwork will be deposited by PCA with LAARC under site code OOL17. Until then the archive will be stored at PCA's headquarters in Brockley, London.

9.6 The results of the archaeological investigation will be published as an entry in the *London Archaeologist* 'Round Up'.

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11 ACKNOWLEDGEMENTS

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11.2 Pre-Construct Archaeology would like to thank Adam Single of Historic England for monitoring the work on behalf of the London Borough of Barking and Dagenham.

11.3 The author acknowledges the PCA fieldwork team associated with the project including Kalliopi Themili and Przemek Polokiewicz for their work during the June-July watching brief and Guy Seddon for his work on the September evaluation.

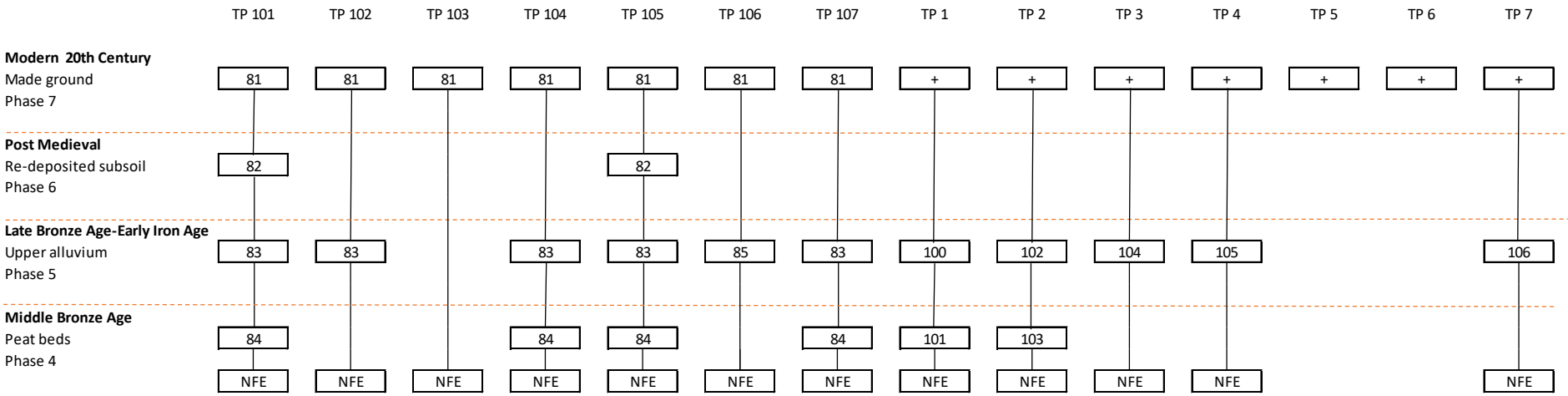
11.4 Thanks are also given to Barney Stephenson from McLaren for the surveying and Tillia Cammegh for the illustrations.

11.5 Special thanks are given to Chris Mayo for his project management and the editing of this report.

12 APPENDIX 1: CONTEXT INDEX

Site Code	Context No	Location	Plan	Section	Type	Description	Date	Phase	OD Heights	
									Max	Min
OOL17	81	Attenuation tank	n/a	S101 - 107	Layer	Brick rubble & made ground	Modern	7	1.26	1.00
OOL17	82	Attenuation tank	n/a	S101 - 107	Layer	Dark grey silty gravel	Post-medieval	6	0.00	-0.70
OOL17	83	Attenuation tank	n/a	S101 - 107	Layer	Green-grey sandy clay (upper alluvium)	Late Bronze Age – Early Iron Age	5	-0.48	-1.05
OOL17	84	Attenuation tank	n/a	S101 - 107	Layer	Dark brown peat	Middle Bronze Age	4	-0.90	-1.54
OOL17	85	Attenuation tank	n/a	S106	Layer	Dark blue-grey silty clay (upper alluvium) Same as [83]	Late Bronze Age – Early Iron Age	5	0.00	0.00
OOL17	100	Area 3A/3B TP1	n/a	S10	Layer	Greenish light-grey sandy silt (upper alluvium). Same as [83] & [85]	Late Bronze Age – Early Iron Age	5	-0.57	-0.57
OOL17	101	Area 3A/3B TP1	n/a	S10	Layer	Dark brown peat (poorly formed). Same as [84]	Middle Bronze Age	4	-1.11	-1.11
OOL17	102	Area 3A/3B TP2	n/a	S11	Layer	Greenish light-grey sandy silt (upper alluvium). Same as [83], [85] & [100]	Late Bronze Age – Early Iron Age	5	-0.64	-0.64
OOL17	103	Area 3A/3B TP2	n/a	S11	Layer	Dark brown peat (poorly formed). Same as [84] & [101]	Middle Bronze Age	4	-1.42	-1.42
OOL17	104	Area 3A/3B TP3	n/a	S12	Layer	Greenish light-grey sandy silt (upper alluvium). Same as [83], [85], [100] & [102]	Late Bronze Age – Early Iron Age	5	-0.88	-0.88
OOL17	105	Area 3A/3B TP4	n/a	S13	Layer	Greenish light-grey sandy silt (upper alluvium). Same as [83], [85], [100], [102] & [104]	Late Bronze Age – Early Iron Age	5	-0.86	-0.86
OOL17	106	Area 3A/3B TP7	n/a	S16	Layer	Greenish light-grey sandy silt (upper alluvium). Same as [83], [85], [100], [102], [104] & [105]	Late Bronze Age – Early Iron Age	5	-1.16	-1.16

13 APPENDIX 2: SITE MATRIX



14 APPENDIX 3: OASIS FORM

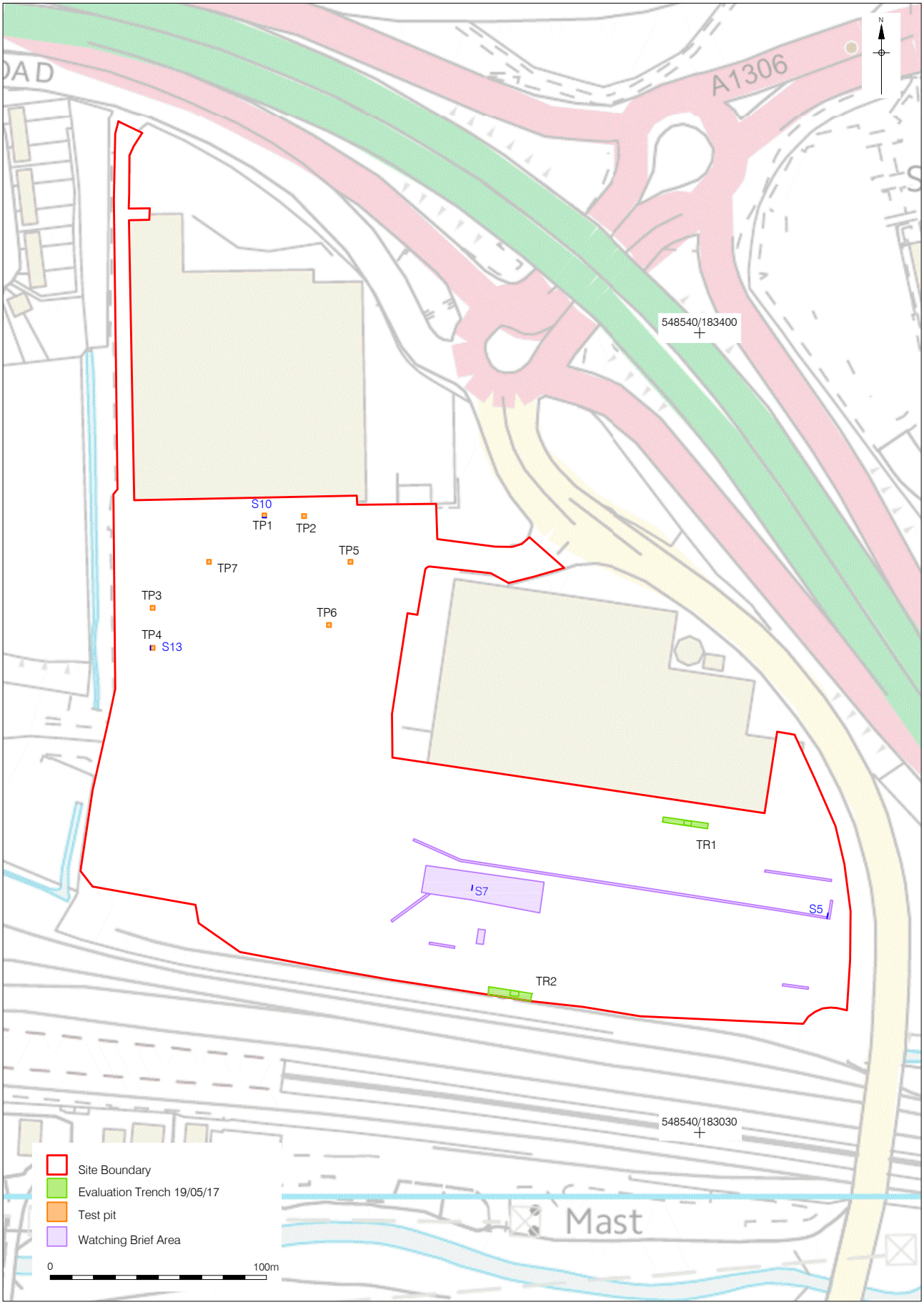
OASIS ID: preconst1-299806

Project details	
Project name	Goresbrook Park, Dagenham, Greater London
Short description of the project	A watching brief during the installation or new drainage systems and a test-pit survey within the area of a proposed new building. The work revealed further evidence for the seven-phase archaeological sequence established in 1993 and confirmed in recent another evaluation, but exposed no significant archaeological remains.
Project dates	Start: 05-06-2017 End: 28-09-2017
Previous/future work	Yes / Not known
Any associated project reference codes	preconst1-284742 - OASIS form ID
Any associated project reference codes	OOL17 - Sitecode
Any associated project reference codes	16/01475/FUL - Planning Application No.
Type of project	Recording project
Site status	Local Authority Designated Archaeological Area
Current Land use	Vacant Land 1 - Vacant land previously developed
Monument type	PEAT Bronze Age
Significant Finds	NONE None
Investigation type	"Test-Pit Survey","Watching Brief"
Prompt	Planning condition
Project location	
Country	England
Site location	GREATER LONDON BARKING AND DAGENHAM DAGENHAM Goresbrook Park
Postcode	RM9 6RS
Study area	5.3 Hectares
Site coordinates	TQ 48432 83233 51.527966794075 0.140026310543 51 31 40 N 000 08 24 E Point
Lat/Long Datum	Unknown
Height OD / Depth	Min: -4.66m Max: -4.66m
Project creators	
Name of Organisation	Pre-Construct Archaeology Limited
Project brief originator	Consultant
Project design originator	Chris Mayo
Project director/manager	Chris Mayo
Project supervisor	Kalliopi Themeli
Project supervisor	Przemek Polakiewicz
Project supervisor	Guy Seddon
Type of sponsor/funding body	Developer
Name of sponsor/funding body	LMP Dagenham Ltd
Project archives	
Physical Archive recipient	LAARC
Physical Archive ID	OOL17
Physical Contents	"Wood"
Digital Archive recipient	LAARC
Digital Archive ID	OOL17
Digital Contents	"Stratigraphic"
Digital Media available	"Images raster / digital photography","Images vector","Spreadsheets","Text"

Paper Archive recipient	LAARC
Paper Archive ID	OOL17
Paper Contents	"Stratigraphic"
Paper Media available	"Context sheet","Notebook - Excavation',' Research',' General Notes","Plan","Section"
Project bibliography 1	
Publication type	Grey literature (unpublished document/manuscript)
Title	Goresbrook Park, Dagenham, London: An Archaeological Watching Brief and Evaluation
Author(s)/Editor(s)	Perkins, W.
Other bibliographic details	PCA R13080
Date	2017
Issuer or publisher	Pre-Construct Archaeology Limited
Place of issue or publication	London
Description	A4 grey literature document in pdf format, with PCA covers
Entered by	Chris Mayo (cmayo@pre-construct.com)
Entered on	01-Nov-17

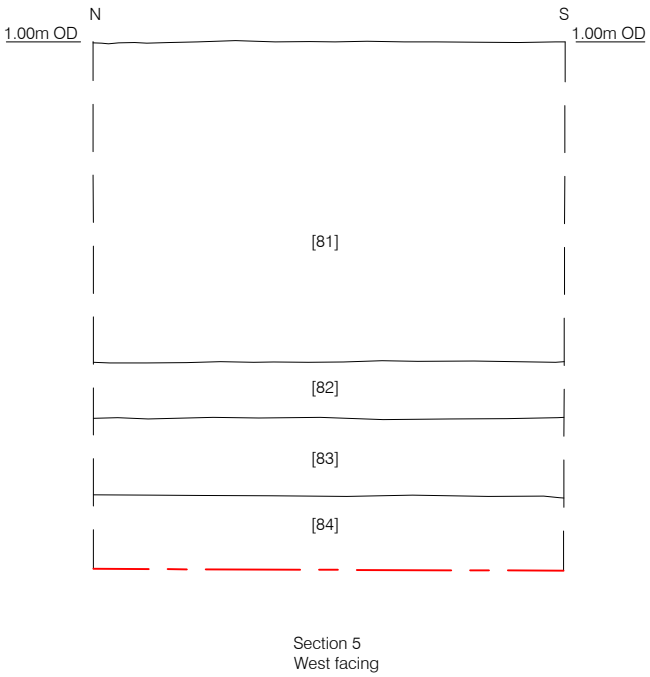
23/10/17 TC

Figure 1
Site Location
1:25,000 at A4



23/10/17 TC

Figure 2
Trench Location
1:2,500 at A4



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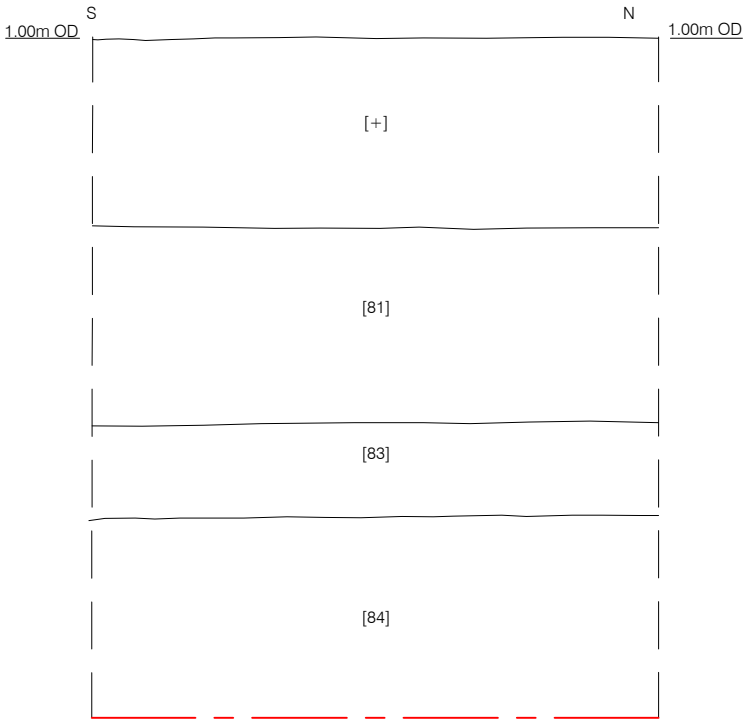
West facing



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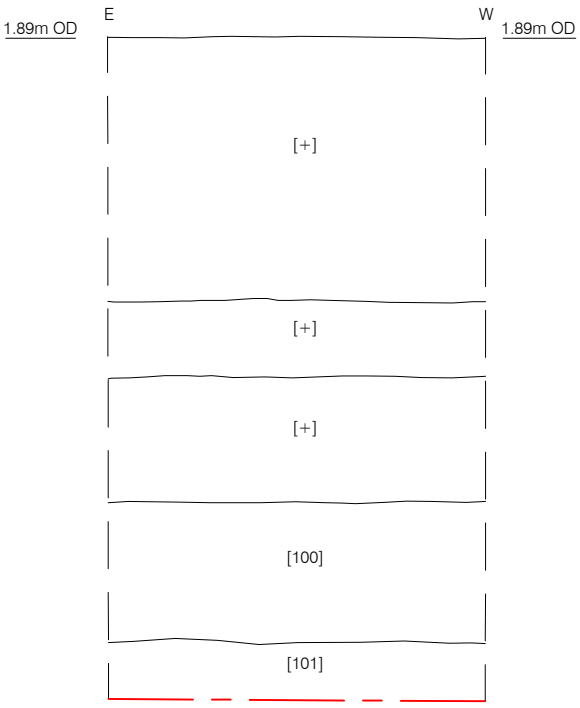
East facing



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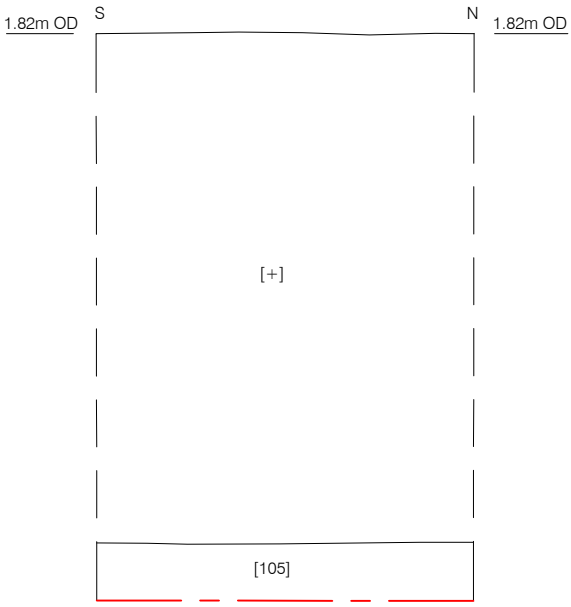
North facing
Test Pit 1



Section 13
East facing
Test Pit 4

23/10/17 TC

Figure 3
Sections
1:40 at A4

P C A

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