ASSESSMENT OF AN ARCHAEOLOGICAL AND GEOARCHAEOLOGICAL EVALUATION OF LAND AT 32 ST JAMES LANE, HORNS CROSS, GREENHITHE, KENT, DA9 9LG

LOCAL PLANNING AUTHORITY: KENT COUNTY COUNCIL

PCA REPORT NO. R12545

JULY 2016

PRE-CONSTRUCT ARCHAEOLOGY

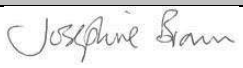
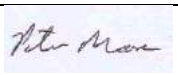
DOCUMENT VERIFICATION

ASSESSMENT OF AN ARCHAEOLOGICAL AND GEOARCHAEOLOGICAL EVALUATION OF LAND AT 32 ST JAMES LANE, HORNS CROSS, GREENHITHE, KENT, DA9 9LG

AN HISTORIC ENVIRONMENT DESK-BASED ASSESSMENT

Quality Control

Pre-Construct Archaeology Ltd	
Project Number	K4513
Report Number	R12545

	Name & Title	Signature	Date
Text Prepared by:	Guy Seddon		22nd June 2016
Graphics Prepared by:	Jennifer Simonson		7th July 2016
Graphics Checked by:	Josephine Brown		7th July 2016
Project Manager Sign-off:	Peter Moore		7th July 2016

Revision No.	Date	Checked	Approved

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

ASSESSMENT OF AN ARCHAEOLOGICAL AND GEOARCHAEOLOGICAL EVALUATION OF LAND AT 32 ST JAMES LANE, HORNS CROSS, GREENHITHE, KENT, DA9 9LG

Site Code: **KSJL16**

Planning Appeal Ref: **APP/T2215/W/15/3014415**

Central National Grid Reference: **TQ 5745 7411**

Commissioning Client: **Urban Enhance**

Written and Researched by: **Guy Seddon**

Project Manager: **Peter Moore**

Contractor: **Pre-Construct Archaeology Ltd**
Unit 54, Brockley Cross Business Centre
96 Endwell Road, Brockley
London SE4 2PD
Tel: **020 7732 3925**
E-mail: **pmoore@pre-construct.com**
Web: **www.pre-construct.com**

July 2016

CONTENTS

ILLUSTRATIONS

PLATES

ABSTRACT

This report documents the results of an archaeological and geoarchaeological evaluation undertaken by Pre-Construct Archaeology Ltd. (PCA) on land at 32 St James Lane, Horns Cross, Greenhithe, Kent.

The report was commissioned by Urban Enhance.

The site is centred on National Grid Reference TQ 5745 7411.

The evaluation was undertaken between 14th and 17th June 2016. No features or finds of archaeological interest were identified.

INTRODUCTION

This report was commissioned by Urban Enhance and documents the results of an archaeological and geoarchaeological evaluation undertaken by Pre-Construct Archaeology Ltd. (PCA) on land at 32 St James Lane, Horns Cross, Greenhithe, Kent (Fig. 1). The site is centred on National Grid Reference TQ 5745 7411.

The project specification for the excavation outlined a number of specific aims for the archaeological work, these were;

- To locate, evaluate, date and record any archaeological remains, from the Palaeolithic to post-Medieval periods so as to be able to inform an archaeological mitigation strategy.
- To locate and define any truncation which may have wholly or partially removed any archaeological or geological deposits.
- To define whether the natural gravels survive intact or whether they have been disturbed. If these are undisturbed, do they contain any evidence for Palaeolithic activity?

The evaluation showed that the natural gravels survive intact across the study site. No archaeological finds or features were recorded.

The investigations were project-managed for PCA by Peter Moore and supervised by Guy Seddon. The geoarchaeological investigation was carried out by Barry Bishop and Kate Turner and the evaluation was monitored by Wendy Rogers of Kent County Council.

Once all of the archaeological work has been completed, the site archive, including written, drawn and photographic records will be deposited with a local museum.

PLANNING BACKGROUND

The study aims to satisfy the objectives of Kent County Council and Dartford Borough Council, which fully recognise the importance of the buried heritage for which they are the custodians.

The site has planning permission for the residential redevelopment of the site. The site has planning permission for the residential redevelopment of the site. The Local Planning Authority planning reference for the scheme is APP/T2215/W/15/3014415.

3.3 In March 2012, the government published the National Planning Policy Framework (NPPF), which replaces national policy relating to heritage and archaeology (PPS5: Planning Policy Statement 5: Planning for the Historic Environment). The Practice Guide which was issued with PPS5 is still valid however, and English Heritage have provided documentation translating former PPS5 policy into its NPPF counterpart.

3.4 Section 12 of the NPPF, entitled *Conserving and Enhancing the Historic Environment* provides guidance for planning authorities, property owners, developers and others on the conservation and investigation of heritage assets. Overall, the objectives of Section 12 of the NPPF can be summarised as seeking the:

- Delivery of sustainable development
- Understanding the wider social, cultural, economic and environmental benefits brought by the conservation of the historic environment
- Conservation of England's heritage assets in a manner appropriate to their significance, and
- Recognition of the contribution that heritage assets make to our understanding of the past.

3.5 Section 12 of the NPPF recognises that intelligently managed change may sometimes be necessary if heritage assets are to be maintained for the long term. Paragraph 128 states that planning decisions should be based on the significance of the heritage asset, and that level of detail supplied by an applicant should be proportionate to the importance of the asset and should be *no more than sufficient* to review the potential impact of the proposal upon the significance of that asset.

3.6 *Heritage Assets* are defined in Annex 2 of the NPPF as: a building, monument, site, place, area or landscape positively identified as having a degree of significance meriting consideration in planning decisions. They include designated heritage assets (as defined in the NPPF) and assets identified by the local planning authority during the process of decision-making or through the plan-making process.

3.7 Annex 2 also defines *Archaeological Interest* as a heritage asset which holds or potentially could hold evidence of past human activity worthy of expert investigation at some point. Heritage assets with archaeological interest are the primary source of

evidence about the substance and evolution of places, and of the people and cultures that made them.

3.8 A *Designated Heritage Asset* comprises a: World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area.

3.9 *Significance* is defined as: The value of a heritage asset to this and future generations because of its heritage interest. This interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting.

3.10 In short, government policy provides a framework which:

- Protects nationally important designated Heritage Assets (which include World Heritage Sites, Scheduled Ancient Monuments, Listed Buildings, Protected Wreck Sites, Registered Parks and Gardens, Registered Battlefields or Conservation Areas)
- Protects the settings of such designations
- In appropriate circumstances seeks adequate information (from desk based assessment and field evaluation where necessary) to enable informed decisions
- Provides for the excavation and investigation of sites not significant enough to merit *in-situ* preservation.

3.11 In considering any planning application for development, the planning authority will be mindful of the framework set by government policy, in this instance the NPPF, by current Development Plan Policy and by other material considerations.

3.12 The relevant Local Plan framework is provided by the Dartford Borough Council Local Plan Review Second Deposit Draft, dated September 2002. Since September 2007 a number of saved policies remain valid until the adoption of the Local Development Framework (LDF) Development Management Policies. Saved policies relating to archaeology include:

BE10 SCHEDULED ANCIENT MONUMENTS

DEVELOPMENT ON OR NEAR THE SITE OF A SCHEDULED ANCIENT MONUMENT WHICH WOULD HAVE AN ADVERSE IMPACT ON THE ARCHAEOLOGICAL INTEREST OR ITS SETTING WILL NOT BE PERMITTED.

BE11 PROTECTION OF SITES OF LOCAL ARCHAEOLOGICAL VALUE

PLANNING PERMISSION WILL ONLY BE GRANTED FOR DEVELOPMENT WHICH WOULD HAVE A DETRIMENTAL EFFECT UPON THE REMAINS OF LOCAL ARCHAEOLOGICAL VALUE IF THE IMPORTANCE OF THE DEVELOPMENT

OUTWEIGHS THE LOCAL VALUE OF THE REMAINS. IF PLANNING PERMISSION IS GRANTED, CONDITIONS WILL BE IMPOSED TO ENSURE THAT THE REMAINS ARE PROPERLY RECORDED, EVALUATED AND, WHERE PRACTICABLE, PRESERVED.

B12

OTHER SITES OF ARCHAEOLOGICAL SIGNIFICANCE WILL BE PROTECTED FROM DEVELOPMENT WHERE THE ARCHAEOLOGICAL INTEREST IS OF OVERRIDING IMPORTANCE. WHERE THE INTEREST IS NOT OVERRIDING, DEVELOPMENT PROPOSALS MAY BE PERMITTED WHERE IT CAN BE DEMONSTRATED THAT THE SITE CAN BE PRESERVED EITHER IN SITU (THE PREFERRED OPTION) OR BY MAKING A DETAILED RECORD OF IT FOR FUTURE ARCHAEOLOGICAL REFERENCE. APPROPRIATE CONDITIONS WILL BE ATTACHED TO ANY PLANNING PERMISSION.

3.13 The study site has the benefit of outline planning consent (13/00046/OUT) subject to an archaeological planning condition.

04

BEFORE COMMENCEMENT OF ANY BUILDING OPERATIONS ON SITE, DETAILS OF A PROGRAMME OF ARCHAEOLOGY WORK IN ACCORDANCE WITH A WRITTEN SPECIFICATION AND TIMETABLE, SHALL BE SUBMITTED TO AND APPROVED BY THE LOCAL PLANNING AUTHORITY. THE DETAILS SHALL BE IMPLEMENTED AS APPROVED.

04

TO ENSURE THAT FEATURES OF ARCHAEOLOGICAL INTEREST ARE PROPERLY EXAMINED AND RECORDED IN ACCORDANCE WITH POLICY B12 OF THE ADOPTED DARTFORD LOCAL PLAN

3.14 It was decided that a programme of archaeological evaluation would form appropriate mitigation in this instance; followed if necessary by targeted areas of extended excavation should significant archaeological remains be present.

4 GEOLOGY AND TOPOGRAPHY

4.1 Geology

4.1.1 The British Geological Survey of England and Wales (Sheet 271) states that the underlying geology of the site is of Chalk Bedrock of the Seaford Chalk Formation.

4.1.2 The chalk bedrock is sealed by Boyn Hill Gravels, which is in turn sealed by subsoil deposits and topsoil.

4.2 Topography

4.2.1 The site which is sub-rectangular in shape, lies at the top of a chalk ridge at c.39m OD.

4.2.2 It is bounded to the north, west and south by residential units and to the east by St James Lane.

5 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

5.1 Palaeolithic

5.1.1 Pleistocene deposits of the Boyn Hill / Orsett Formation are preserved as a band from Dartford through Stone to Northfleet along the south banks of the Lower Thames Valley. They can contain significant quantities of artefactual and palaeo-environmental information and are best known for the discovery of Pleistocene hominid remains at Swanscombe during the 1930s and 1950s. A large body of Palaeolithic material was recovered from Globe Pit, Greenhithe between 1900 and 1920 (KE 792, TQ 5885 7462). The material, mainly of Acheulian and Mousterian types, appears to have originated from several palaeo-landsurfaces. Further Palaeolithic finds are recorded from the area of Beechin Wood cottages (KE 847, TQ 5805 7338).

5.1.2 The broken tip of an Acheulian handaxe was discovered during topsoil removal in an archaeological evaluation at Stone Castle in 2004 (Haslam 2004). This artefact is believed to have originated from the underlying Pleistocene Boyn Hill gravels.

5.1.3 An evaluation at Horns Cross to the north of the site found a Palaeolithic flint flake in the gravels within a test pit

5.2 Mesolithic

5.2.1 Sites and finds from before the Neolithic are generally very rare, and no finds of Mesolithic material have been recorded from the immediate vicinity of the study site.

5.3 Neolithic

5.3.1 Three Neolithic axes are known from the Greenhithe stretch of the River Thames (KE 762, TQ 5875), but only small quantities of Neolithic pottery and flints are recorded from the many quarries in the vicinity (KE 858, TQ 5974).

5.4 Bronze Age

5.4.1 A socketed Bronze Age spearhead is known from Stone Castle (KE 791, TQ 5759 7476) and a large assemblage of Bronze Age Beaker pottery was found north of Beechin Wood cottages (KE 847, TQ 5805 7338).

5.4.2 The Stone Castle excavation of 2004 revealed a ring ditch with an associated pit. This ditch was interpreted as representing a ploughed down low barrow (Haslam 2005, 25-6), and pottery recovered from the fill of the pit suggested a mid to late Bronze Age deposition date.

5.5 Iron Age

5.5.1 During the excavation of Stone Castle chalk pit a large Iron Age pit was identified (KE 824, TQ 5796 7400). This was 4m in diameter and 6m deep. The feature was not

examined in detail prior to its destruction. In 1960 and 1961 rescue excavations by the then Ministry of Works in Stone Castle chalk pit (Detsicas 1966) identified a hut circle and cattle enclosure of Late Iron Age date; probably representing a farmstead (KE 830, TQ 5818 7335).

5.5.2 During the Stone Castle excavation of 2004 the crouched burial of a male aged between 25 and 35 was discovered interred with a grave good in the form of a polished sandstone rubber or pounder.

5.5.3 Late Iron Age discoveries were also made in 1939 during quarrying operations in the Cotton Lane Pit, which lay about one mile west of the village of Stone. These discoveries were reported in the Proceedings of the Prehistoric Society (Cotton & Richardson 1941) and included 24 almost complete pots, some of which were described as cremations, odd bones and sherds, 4 bronze brooches, fragments of wood associated with bronze fittings and scrap iron. None of these finds were witnessed in situ but a lack of evidence of settlement resulted in the site being interpreted as a cremation cemetery dated to between AD 24 and AD 45.

5.6 Roman

5.6.1 The Roman Road from London to Rochester passes along the boundary of the study site. The 1960 – 61 excavations at Stone Castle chalk pit revealed the remains of a Romano-British settlement, probably a farmstead, represented by pits, ditches and the flint footings of a small building (KE 830, TQ 5818 7335). Numerous finds were recovered, including several brooches (KE 459 and KE 3896). In 1902 – 1904 topsoil stripping in preparation for the cutting of Stone Castle chalk pit revealed a Romano British cemetery containing 5 burials, probably associated with the settlement identified in 1961 (KE 782, TQ 5848 7436). The burials included cremations and inhumations, all with significant quantities of grave goods. A number of other finds of Roman date are recorded in the immediate vicinity and include a chalk quarry reused for disposing of three inhumation burials and ritual deposits (KE 796, TQ 5895 7477 also recorded as KE 863, TQ 5974), a small cemetery near Ingress Abbey (KE 832, TQ 5894 7488) and a settlement in the area of Mounts Wood, now destroyed (KE 777, TQ 589 733).

5.6.2 The excavation at the Cotton Lane Pit in 1939 also revealed evidence of continued occupation into the Roman period in the form of two Roman vessels. Three of the brooches discovered, which included a Hod Hill type brooch, were dated to the Claudian period.

5.6.3 The majority of the archaeological evidence revealed during the Stone Castle excavation of 2004 dated to the early Roman period, and included a rectangular field system defined by three linear boundary ditches. A number of gullies and grain storage pits were recorded in association with these ditches, suggesting that the land

was being utilised throughout this period for agricultural purposes. Small finds recovered from the various grain storage pits consisted of a Hod Hill type brooch, a Colchester brooch, the tip of a sheath, a bone gouge, fragments of Roman armour and both puddingstone quern and whetstone fragments along with deliberately placed pottery and animal bone deposits.

5.6.4 Further vessels displaying post-firing holes were also recovered from the boundary ditches, suggesting that these features were significant not only as practical but also as symbolic boundaries. The presence of the small finds, pottery and animal bone within the grain storage pits defined the organisation of specific ritualised activity on the site, with offerings being placed within the pits in order to secure successful harvests. This religious practice has been referred to by Barry Cunliffe as 'the pit belief system' (Cunliffe 2002, 536) and is normally associated with the Iron Age period, particularly in the central southern area of Britain. The final phase of activity relating to the early Roman period involved the introduction of a new east-west aligned boundary ditch, which replaced the earlier rectangular field system. This ditch was eventually re-cut, and was recorded in association with a human cremation located in the eastern portion of excavation Area A.

5.7 Saxon and Early Medieval

5.7.1 No findspots of Saxon or early medieval date occur in the vicinity of the study site.

5.7.2 In the Domesday Survey of 1086, Stone is recorded as an agricultural estate, part of the lands of the Bishop of Rochester:

"Stone. Before 1066 it answered for 6 sulungs; now for 4 sulungs. Land for 11 ploughs. In Lordship 2.20 villeins with 12 smallholders have 11 ploughs. A church; 4 slaves; meadow, 72 acres; a mill at 6s 8d; a fishery at 3s 4d; woodland, 60 pigs. Value before 1066 and later £13; now £16; however, it pays £20, an ounce of gold and a porpoise.

Richard of Tonbridge holds as much woodland from this manor as is valued at 15s"

5.8 Medieval and Post-Medieval to 1900

5.8.1 Throughout this period the site is likely to have been utilized as open agricultural land and woodland.

6 ARCHAEOLOGICAL METHODOLOGY

6.1 The archaeological and geoarchaeological evaluation was carried out in a single stage. Four trenches with a basal measurement of 5m x 1.8m were opened up with a 360° tracked mechanical excavator, which removed the topsoil and subsoil in spits of no more than 0.10m at a time, after which examination of the trenches continued using the appropriate hand tools and the trenches were left open for four days in order to allow any features to weather out.

6.2 One end of each trench was selected and machine excavated in spits by a Palaeolithic specialist and a geoarchaeologist so as to identify and record the stratigraphic sequence, examine and record the deposits and identify any palaeoarchaeological artefacts or ecofacts (Fig 4). Results of these investigations can be found in appendix 4.

6.3 A sample of 100 litres of each deposit was sieved through a 0.01m sieve in order to retrieve any palaeoarchaeological artefacts, which were then examined on site by the attending specialist.

6.5 All the survey work and levels were carried out using a hand held GPS. Sections were drawn at a scale of 1:10 using diametrically stable drafting film. Context numbers were allocated as appropriate.

6.6 Digital photographs were also taken where relevant.

7 ARCHAEOLOGICAL SEQUENCE

7.1 Phase 1: Natural Geology

7.1.1 The natural geology of the site is discussed in depth in the Geoarchaeological Field Investigation, (B. Bishop). In brief, the earliest deposits revealed on site were of Boyn Hill gravels, dating to the Palaeolithic period and recorded as [3], [6], [9] and [12] within the separate trenches.

7.1.2 The gravels were firmly compacted, dark yellowish red and lay within a clayey sand matrix and fell from a height of 38.94m OD in Tr2 in the west of the site to 38.53m OD in Tr4 to the east of the site.

7.2 Phase 2: Post-Medieval

7.2.1 This phase is represented by a layer of horticultural subsoil, recorded as [2], [5], [8] and [11].

7.2.2 This deposit overlay and sealed the Boyn Hill gravels and comprised of firmly compacted, mid reddish grey gravels in a slightly clayey, sandy matrix and has been interpreted as a plough soil which fell from 38.98m OD in Tr2 to a height of 38.74m OD in Tr3.

7.3 PHASE 3: MODERN

7.3.1 Overlying the plough soil was a deposit of modern garden topsoil, [1], [4], [7] and [10], which was sealed in the area of Trench 3 by concrete paving slabs, forming the current ground level at between 39.35m OD in Tr2 and 38.87m OD in Tr3.

8 ORIGINAL AND ADDITIONAL RESEARCH OBJECTIVES

8.1 ORIGINAL RESEARCH OBJECTIVES

8.1.1 The specification for archaeological work, prepared before the commencement of the excavation phase, outlined a number of broad research objectives that should be addressed by the project:

- To locate, evaluate, date and record any archaeological remains, from the Palaeolithic to post-Medieval periods so as to be able to inform an archaeological mitigation strategy.

  No finds or features relating to the Palaeolithic or later periods were recorded on the study site.

- To locate and define any truncation which may have wholly or partially removed any archaeological or geological deposits.

  No truncations were observed, either wholly or partially removing any archaeological deposits.

- To define whether the natural gravels survive intact or whether they have been disturbed. If undisturbed do they contain any evidence for Palaeolithic activity?

  The presence of the plough soil within all the trenches indicates that the underlying gravels survive intact.

8.1.2 No evidence for Palaeolithic activity was observed during the evaluation.

9 ACKNOWLEDGEMENTS

9.1 Pre-Construct Archaeology Ltd. would like to thank Urban Enhance for commissioning and funding the fieldwork. Thanks also Wendy Rogers, who monitored the archaeological fieldwork on behalf of Kent County Council.

9.2 The author would like to thank the project manager Peter Moore his management and support. Further thanks are extended to all members of the post-excavation assessment team who have contributed to this report, Barry Bishop and Kate Turner. Also many thanks to Jennifer Simonson for work on the illustrations in this report and to Richard Archer for surveying.

9.3 Finally, thanks to Bruce Ferguson who worked on the site and whose contribution is greatly appreciated. Thanks also to John Joyce and Wayne Rogers for technical support.

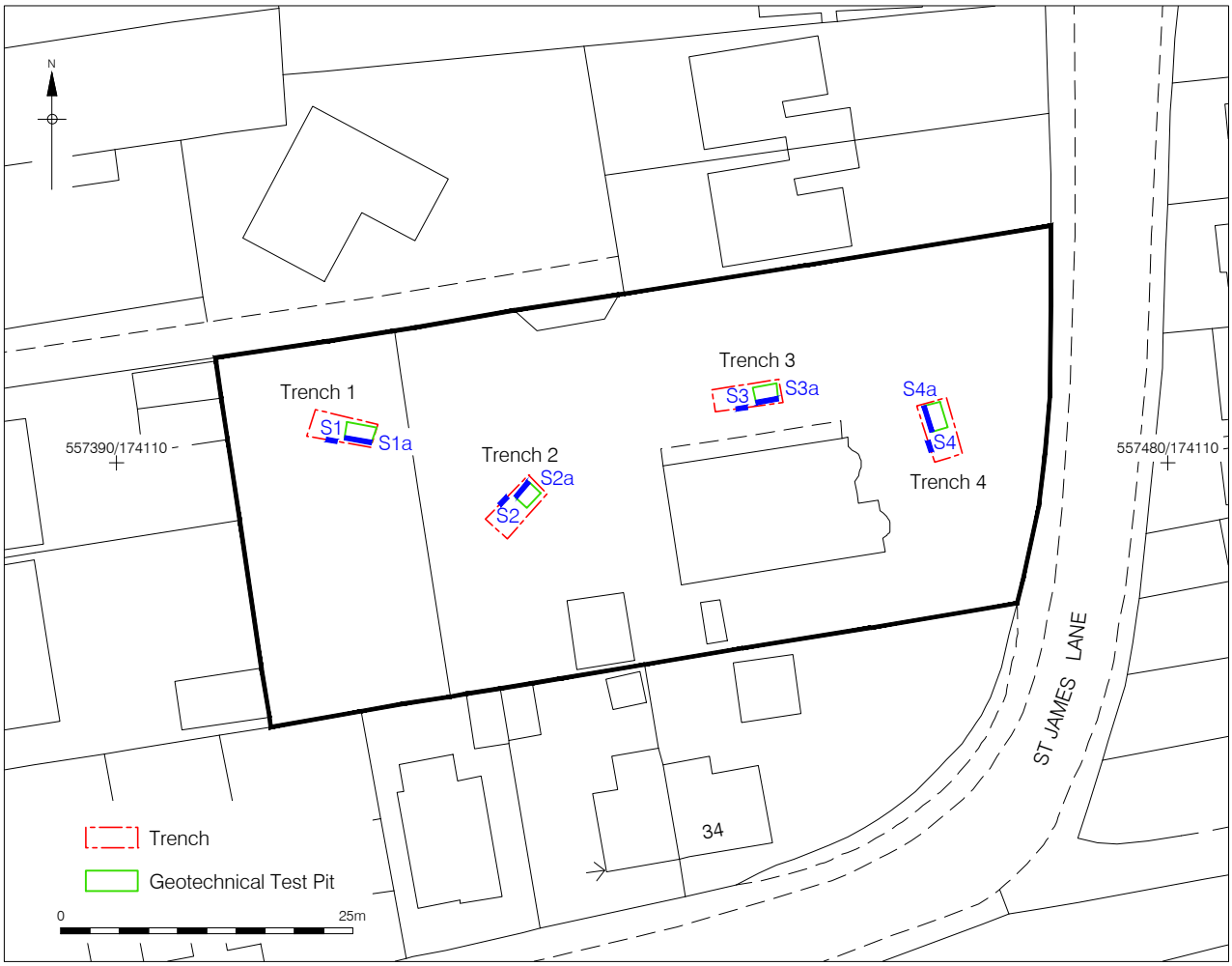
BIBLIOGRAPHY

Moore, P. 2016 *Written Scheme of Investigation for an Archaeological & Geoarchaeological Evaluation of Land at 32 St James Lane, Horns Cross, Greenhithe, Dartford, Kent, DA9 9LG*. Pre-Construct Archaeology Ltd, Unpublished Report.

Haslam, A. 2009 *An Assessment of an Archaeological Excavation on Land at Residential Phase II (Southern Parcel), Waterstone Park, Stone Castle, Kent*. Pre-Construct Archaeology Ltd, Unpublished Report.

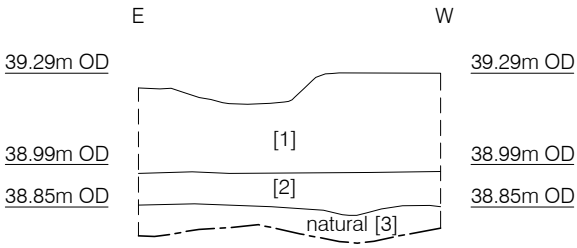
07/07/16 JS

Figure 1
Site Location
1:2,000,000 & 1:25,000 at A4

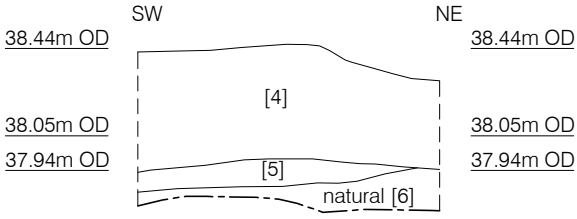


07/07/16 JS

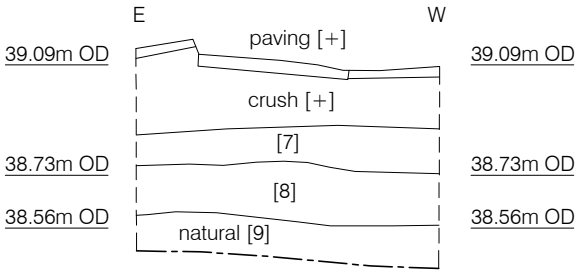
Figure 2
Trench Location
1:625 at A4



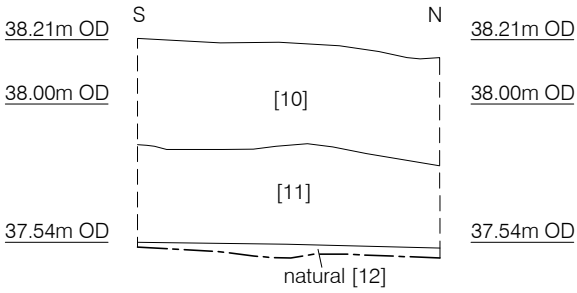
Section 1
Trench 1
North Facing



Section 2
Trench 2
Southeast Facing



Section 3
Trench 3
North Facing

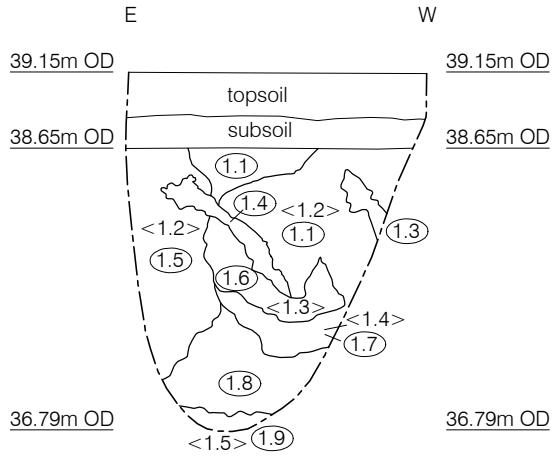


Section 4
Trench 4
East Facing

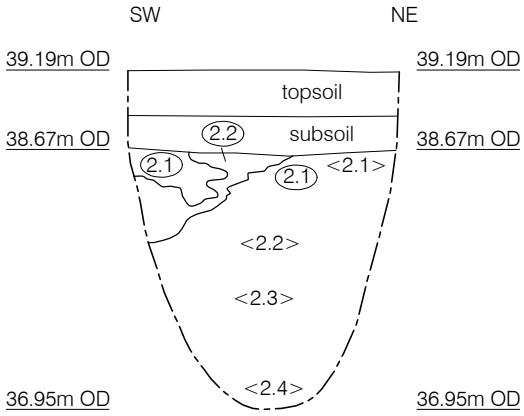
0 1m

07/07/16 JS

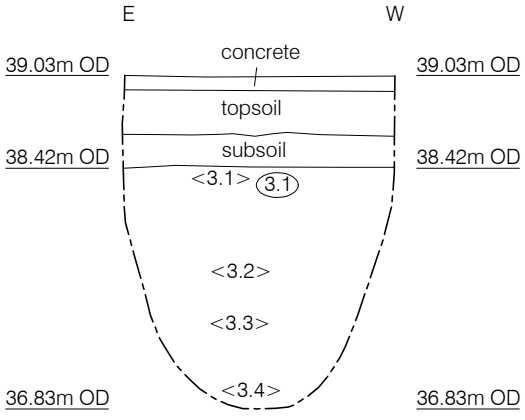
Figure 3
Sections from Evaluation Trenches
1:25 at A4



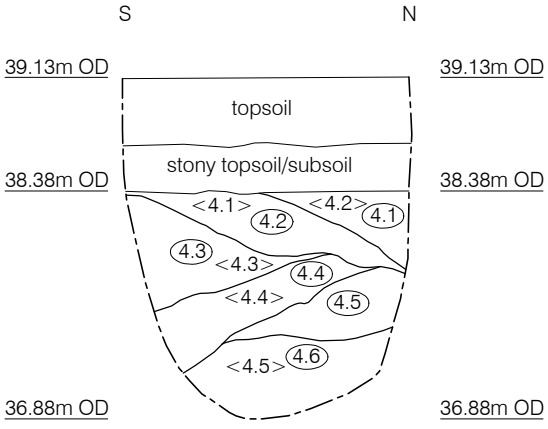
Section 1a
Trench 1
North Facing



Section 2a
Trench 2
Southeast Facing



Section 3a
Trench 2
North Facing



Section 4a
Trench 4
East Facing

07/07/16 JS

Figure 4
Sections from Geotechnical Test Pits
1:50 at A4

APPENDIX 1: PLATES

Plate 1: Trench 1 Looking West

Plate 2: Section 1, Trench 1

Plate 3: Trench 1 Geoarchaeological Test Pit

Plate 4: Trench 2 Looking SW

Plate 5: Section 2, Trench 1

Plate 6: Trench 2 Geoarchaeological Test Pit

Plate 7: Trench 3 Looking West

Plate 8: Section 3, Trench 3

Plate 9: Trench 3 Geoarchaeological Test Pit

Plate 10: Trench 4 Looking South

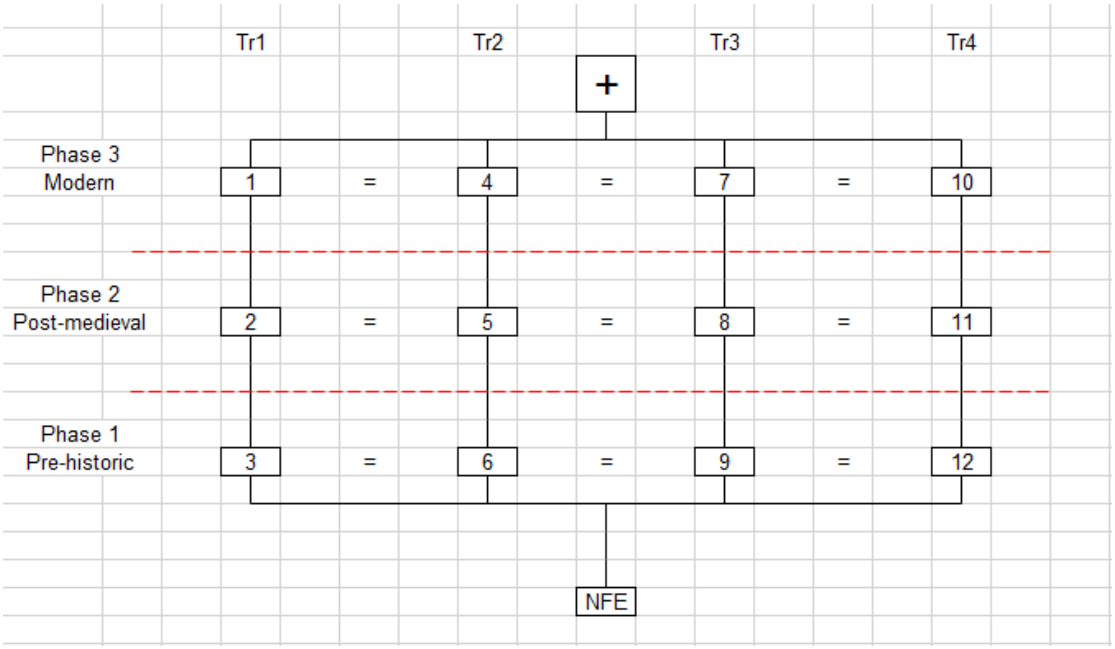
Plate 11: Section 4, Trench 4

Plate 12: Trench 4 Geoarchaeological Test

APPENDIX 1: CONTEXT INDEX

Context	CTX_Type	CTX_equalt	CTX_Over	CTX_Under	Trench	CTX_Description	CTX_Category	CTX_Depth	CTX_Levels_high	CTX_Levels_low	Phase
1	Layer	4, 7, 10	+	2	1	Topsoil. Firmly compacted mid greyish brown sandy silt.	Garden soil	0.25	39.29	39.19	3
2	Layer	5, 8, 11	1	3	1	Subsoil. Firmly compacted, brown clayey, sandy gravel.	Horticultural	0.2	38.97	38.95	2
3	Layer	6, 9, 12	2	NFE	1	Boyn Hill Gravels. Firm - compact, dark yellowish red clayey, sandy gravels.	Natural		38.86	38.82	1
4	Layer	1, 7, 10	+	5	2	Topsoil. Firmly compacted mid greyish brown sandy silt.	Garden soil	0.24	39.35	39.23	3
5	Layer	2, 8, 11	4	6	2	Subsoil. Firmly compacted, brown clayey, sandy gravel.	Horticultural	0.1	38.98	38.93	2
6	Layer	3, 9, 12	5	NFE	2	Boyn Hill Gravels. Firm - compact, dark yellowish red clayey, sandy gravels.	Natural		38.94	38.86	1
7	Layer	1, 4, 10	+	8	3	Topsoil. Firmly compacted mid greyish brown sandy silt.	Garden soil	0.19	38.9	38.87	3
8	Layer	2, 5, 11	7	9	3	Subsoil. Firmly compacted, brown clayey, sandy gravel.	Horticultural	0.2	38.78	38.74	2
9	Layer	3, 6, 12	8	NFE	3	Boyn Hill Gravels. Firm - compact, dark yellowish red clayey, sandy gravels.	Natural		38.62	38.57	1
10	Layer	1, 4, 7	+	11	4	Topsoil. Firmly compacted mid greyish brown sandy silt.	Garden soil	0.35	39.22	39.15	3
11	Layer	2, 5, 8	10	12	4	Subsoil. Firmly compacted, brown clayey, sandy gravel.	Horticultural	0.31	38.87	38.8	2
12	Layer	3, 6, 9	11	NFE	4	Boyn Hill Gravels. Firm - compact, dark yellowish red clayey, sandy gravels.	Natural		38.55	38.53	1

APPENDIX 2: SITE MATRIX



APPENDIX 3: PALEOLITHIC ASSESSMENT

Barry John Bishop

1. INTRODUCTION

This report describes and comments on the Quaternary geology encountered during an Archaeological Field Evaluation of the above site.

The site lies towards the southern edge of an outcrop of Quaternary terrace geology mapped as part of the Boyn Hill Gravel Formation (British Geological Survey 1998). The Boyn Hill terrace equates with the lower Thames Middle Pleistocene Orsett Heath Gravel Formation, generally thought to have been deposited during late OIS 12 to early OIS 10, around 430,000 to 350,000BP (Bridgland 1994; Gibbard 1994). However, the upper parts of the sequence as recorded at the Barnfield Pit (Swanscombe Stage III) may indicate deposition continued until OIS 8, c. 303,000 – 245,000BP) (Conway et al. 1996, fig 8.7; 239). It is the highest and oldest terrace and the first to have been formed in the lower Thames valley following the diversion of the Thames during the Anglian glaciation. It is preserved as a discontinuous band from Dartford through Stone to Northfleet along the south banks of the lower Thames valley. It has produced significant and, at some locations, internationally important artefactual and palaeo-environmental sequences and is perhaps best known for the discovery of hominid remains at the Barnfield Pit in Swanscombe (TQ598743). Numerous finds of stray Palaeolithic implements have been made in the Stone area and significant discoveries have been made at several locations, notably at the Globe Pit, Greenhithe (TQ587746), Dierden's Pit, Ingress Vale (TQ595748), Craylands Lane Pit, Swanscombe (TQ600747) and the Swan Valley Community Scholl, Swanscombe (TQ609738) (Wymer 1968; 1999; Roe 1981; Wenban-Smith and Bridgland 2001).

2. METHODOLOGY

The Geoarchaeological evaluation involved the excavation of four test-pits, located within the footprints of the excavated archaeological evaluation trenches, to depths exceeding any potential impact from the proposed development at the site.

The test pits measured c.2m X 2m in plan and were machine excavated to a depth of at least 2m bgl, using a 1.8m wide toothless ditching bucket in spits of no more than 100mm thickness whilst taking care to avoid crossing stratigraphic boundaries. Representative sections of each test-pit were photographed and drawn from the side of each test-pit, as they were too deep to enter safely.

100 litre samples were taken using the machine bucket from each significant geological unit and sieved through a 10mm mesh, with all other spoil being thoroughly searched on the side of the pits for any artefacts and environmental indicators.

3. GEOLOGICAL SEQUENCE

Geoarchaeological Test-pit 1 (East End of Archaeological Trench 1)

The ground level height of Test-pit 1 was at 39.15m OD on the surface of garden topsoil. Topsoil and reworked sub-soils overlay highly contorted Quaternary sands and gravels which were encountered at a maximum height of 38.65m OD and were observed to a depth of 36.77m OD. The deposits comprised a single sequence of sandy silty-clay gravels interspersed with high contorted and steeply inclined sandy lenses that probably fill deformed peri-glacial structures such as ice wedges. Nine sub-units were recorded, which are essentially similar but vary in the proportion of silt-clay matrix. The lowest sub-unit recorded, [1.9], which was encountered at a maximum height of 36.94m OD, might possibly represent the upper parts of a new finer-grained deposit although too little was seen to form any definitive conclusions. The gravel clasts are similar to those seen in the other trenches and comprise c. 70-80% well rounded dark coloured Tertiary pebbles 10-60mm maximum dimension and 20-30% angular chalk flint nodular fragments <100mm maximum dimension, along with occasional larger angular chalk flint nodular fragments 100-200mm maximum dimension.

Five 100 litre samples taken but no artefactual or organic materials were recovered.

The north facing section was drawn for the record and the sub-unit are described as follows:

[1.1] Loose light yellow sands and gravel 50:50

[1.2] Stiff mid orange brown sandy silt-clay and gravel 90:10 Sample <1.1>

[1.3] Stiff mid orange brown sandy silt-clay and gravel 50:50

[1.4] Stiff mid orange brown sandy clay-silt and gravel 10:90

[1.5] Moderately compacted mid brownish yellow coarse sand and gravel 91:10 Sample <1.2>

[1.6] Stiff mid orange brown sandy silt-clay and gravel 50:50 Sample <1.3>

[1.7] Stiff mid orange brown sandy silt-clay and gravel 90:10 Sample <1.4>

[1.8] Stiff mid orange brown sandy silt-clay and gravel 50:50

[1.9] Moderately compacted mid orange brown sand and silt-clay 50:50 with mottling or possible fine horizontal bedding or laminations Sample <1.5>

Geoarchaeological Test-pit 2 (East End Archaeological Trench 2)

The ground level height of Test-pit 2 was at 39.19m OD on the surface of garden topsoil. Quaternary sands and gravels were encountered immediately below topsoil and sub-soil horizons at a maximum height of 38.69m OD and were observed to a maximum depth of 36.94m OD. A single deposit of massive or weakly bedded gravels in a sandy silt-clay matrix was observed throughout the thickness, with s single, highly contorted lens of coarse sand seen near the uppermost levels. The gravel clasts are similar to those seen in the other trenches and comprise c. 70-80% well rounded dark coloured Tertiary pebbles 10-60mm maximum dimension and 20-30% angular chalk flint nodular fragments <100mm maximum dimension, along with occasional larger angular chalk flint nodular fragments 100-200mm maximum dimension,

Four 100 litre samples taken but no artefactual or organic materials were recovered.

The south facing section was drawn for the record and the deposits described as follows:

[2.1] Stiff mid orange sandy silt-clay and gravel 40:60 changing imperceptibly to 60:40 below c. 37.44m OD. Occasional contorted light yellow coarse sand lenses <100mm in thickness. Samples <2.1>, <2.2>, <2.3> and <2.4>.

[2.2] Loosely compacted light brownish yellow coarse sand

Geoarchaeological Test-pit 3 (East End of Archaeological Trench 3)

The ground level height of Test-pit 3 was recorded at 39.03m OD on the top of a paved slab surface. Quaternary sands and gravels were encountered immediately below topsoil and sub-soil horizons at a maximum height of 38.43m OD and were observed to a maximum depth of 36.82m OD. A single deposit of massive or very weakly bedded gravels in a sandy silt-clay matrix was observed throughout the thickness. The gravel clasts are similar to those seen in the other trenches and comprise c. 70-80% well rounded dark coloured Tertiary pebbles 10-60mm maximum dimension and 20-30% angular chalk flint nodular fragments <100mm maximum dimension with occasional larger angular chalk flint nodular fragments 100-200mm maximum dimension.

Four 100 litre samples taken but no artefactual or organic materials were recovered.

The South facing section was drawn for the record and the deposits described as follows:

[3.1] Stiff mid orange sandy silt-clay and gravel 50:50. Occasional light yellow coarse sand lenses <100mm in thickness. Occasional blocky patches of light grey silty sand < 100mm maximum dimension. Samples <3.1>, <3.2>, <3.3> and <3.4>.

Geoarchaeological Test-pit 4 (North End of Archaeological Trench 4)

The ground level height of Test-pit 4 was at 39.13m OD on the surface of garden topsoil. Quaternary sands and gravels were observed beneath topsoil and sub-soil deposits at a maximum height of 38.39m OD. Six units of Pleistocene deposits were recorded to a depth of at least 36.88m OD. These are all internally massive or very weakly bedded and are similar, only differing in the proportions of gravel clasts present. The units have a very approximate axis aligned southwest-northeast but dipping to either to the northwest or southeast and most probably represent highly contorted peri-glacial structure. The constituents of the gravels are similar to those seen in the other trenches and comprise c. 70-80% well rounded dark coloured Tertiary pebbles 10-60mm maximum dimension and 20-30% angular chalk flint nodular fragments <100mm maximum dimension with occasional larger angular chalk flint nodular fragments 100-200mm maximum dimension.

Five 100 litre samples taken but no artefactual or organic materials were recovered.

The East facing section was drawn for the record and the deposits described as follows:

[4.1] Moderate to firmly compacted mid orange brown silty coarse sand and gravel 50:50. Sample <4.2>

[4.2] Loose to moderately compacted light greyish yellow coarse sand with irregular pockets (c. 400mm maximum dimensions) of sandy silt-clay gravels. Sample <4.1>

[4.3] Moderate to firmly compacted mid orange brown silty coarse sand and gravel 50:50. Sample <4.3>

[4.4] Moderately compacted mid brownish yellow silty coarse sand with lenses of gravel and small pebbles that are often contorted and steeply inclined. Sample <4.4>

[4.5] Moderate to firmly compacted mid orange brown silty coarse sand and gravel 50:50.

[4.6] Moderately compacted mid brownish yellow silty coarse sand with lenses of gravel and small pebbles that are often contorted and steeply inclined. Sample <4.5>

4. SUMMARY

Quaternary sands and gravels were present in all test-pits with a maximum height ranging from between 38.69m OD in Test-pit 2 and 36.39m OD in Test-pit 4, and were seen to a depth of at least 36.77m OD as recorded in Trench 1. The levels at which these were encountered confirm their attribution to the upper parts of Boyn Hill / Orsett Heath Gravel Formation.

The Quaternary deposits at the site consist of a variety of contorted, massive or weekly bedded gravels in a stiff sandy silt-clay matrix exhibiting per-glacial features such as ice wedges. Despite intensive sampling, no artefactual material or environmental indicators were recovered.

Due to the paucity of observations in the immediate area it is difficult to confidentially correlate these deposits to other Pleistocene sequences in the lower Thames, but they are consistent in both composition and recorded heights to the 'stiff brown gravelly clays' of the Upper Gravels at the Barnfield Pit in Swanscombe (Conway et al. 1996, 83, 131). These are thought to equate to hillwash and solifluction of OIS 8 (Wymer 1999, 73). The surface of these at the Barnfield Pit are recorded as at c. 33-34m OD (Conway et al. 1996) but comparable soliflucted deposits were encountered at 38m OD at Stone Castle (Bishop 2004) and extended above 39m OD at the Swan Valley Community School (Wenban-Smith and Bridgland 2001, 230, Unit 8).

Of interest is the very high proportion of Tertiary pebble clasts present in the deposits. Such pebbles are consistently present within the Upper Gravels but not normally in such high proportions , and have presumably having been incorporated relatively locally from pebble beds of the Lambeth Group or Harwich Formation (cf Gibbard 1994, 23), although there are no extant outcrops recorded by the BGS in the vicinity.

5. RECOMMENDATIONS

The geoarchaeological investigations have confirmed the presence at the site of Quaternary deposits equating to the upper parts Boyn Hill / Orsett Heath Gravel Formation that are probably equivalents of the Upper Gravels of the Barnfield pit sequence, and have added further detail to our knowledge of the nature and extent of this deposit. Given the size of the site and that, despite intensive sampling, no artefactual material or environmental indicators were identified, no further work is recommended for the geoarchaeological investigations.

6. BIBLIOGRAPHY

Bishop, B.J. 2004 Evaluation of the Pleistocene deposits and Palaeolithic artefacts from Waterstone Park Residential Phase II, Stone Castle, Kent (Site Code KSTC04). Unpublished PCA Report

Bridgland, D.R. 1994 Quaternary of the Thames. Chapman and Hall. London.

British Geological Survey 1998 Dartford: England and Wales Sheet 271, Solid and Drift Geology, 1: 50, 0000, 2nd series. Keyworth. Nottingham.

Conway, B., McNabb, J. and Ashton, N (Eds.) 1996 Excavations at Barnfield Pit, Swanscombe, 1968-72. British Museum Occasional Paper 94. British Museum Department of Prehistoric and Romano-British Antiquities. London.

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

Roe, D.A. 1981 The Lower and Middle Palaeolithic Periods in Britain. Routledge. London.

Wenban-Smith, F. and Bridgland, D. 2001 Palaeolithic Archaeology at the Swan Valley Community School, Swanscombe, Kent. Proceedings of the Prehistoric Society 67, 219-259.

Wymer,J.J. 1968 Lower Palaeolithic Archaeology in Britain as represented by the Thames Valley. John Baker. London.

Wymer, J.J. 1999 The Lower Palaeolithic Occupation of Britain, Volumes 1 and 2. Wessex Archaeology and English Heritage. Salisbury.

APPENDIX 4: GEOARCHAEOLOGY ASSESSMENT

Kate Turner

1. INTRODUCTION

This report summarises the findings of the evaluation of four trial trenches from an archaeological evaluation at 32 St James Lane, Dartford, Kent. The aim of this assessment is to describe and provide an interpretation of the sedimentary sequences uncovered during the course of the evaluation.

2. METHODOLOGY

Four 2 meter square geoarchaeological test pits were machine excavated within the area of previously excavated archaeological evaluation trenches. Sediment was removed in spits and recorded upon reaching discrete sedimentary boundaries; upon exposure of a representative section of the stratigraphic sequence digging was halted and the sequence was logged following the standard recording procedure (Jones et al., 1999). 100 litre sediment samples were taken from each discrete unit and hand sorted for any artefactual or environmental evidence.

3. RESULTS

The following tables provide the depth, stratigraphy and descriptions of the deposits identified.

Trench 1, section 1

Depth (BGL) (m)	Depth OD (m)	Thickness (cm/m)	Stratigraphy	Context	Description
0	39.15m	0.3 m	Topsoil		10 YR 4/2 dark greyish brown. Loose sandy topsoil , with some large pebble inclusions. Poorly sorted.
Diffuse boundary					
0.30	38.85	0.2 m	Subsoil		5 YR 5/4 reddish brown. Sandy soil matrix with rounded and subrounded pebble inclusions. Poorly sorted.
Diffuse Boundary					
0.50	38.65	1.5 m	Terrace gravels		5 YR 5/8 yellowish red. Boyn Hill gravel formation; sandly silty clay matrix with coarse gravel clasts. Clast size increases toward the base of the profile. Rounded and sub-angular inclusions; vertical banding present.
Diffuse Boundary					
2.0	37.15		Terrace gravels		5 YR 5/8 yellowish red. Sandy silt clay matrix with horizontal bedding structures; possible signs

Depth (BGL) (m)	Depth OD (m)	Thickness (cm/m)	Stratigraphy	Context	Description
					of peri-glacial ice wedging. Fine grained gravel clasts. Well sorted.

Trench 2, section 1

Depth (BGL) (m)	Depth OD (m)	Thickness (cm/m)	Stratigraphy	Context	Description
0	39.19	0.15 m	Topsoil		10 YR 4/2 dark greyish brown. Loose sandy top-soil , with some large pebble inclusions. Poorly sorted.
Diffuse boundary					
0.15	39.04	0.35 m	Subsoil		5 YR 5/4 reddish brown. Sandy soil matrix with rounded and sub-rounded pebble inclusions. Poorly sorted.
Diffuse Boundary					
0.40	38.69	1.25 m	Terrace gravels		5 YR 5/8 yellowish red. Boyn Hill gravel formation; sandly silty clay matrix with coarse gravel clasts. Clast size increases toward the base of the profile. Rounded and sub-angular inclusions; vertical banding present.
Diffuse Boundary					
2.0	37.44	0.5 m	Terrace		10 YR 6/6 brownish

Depth (BGL) (m)	Depth OD (m)	Thickness (cm/m)	Stratigraphy	Context	Description
			gravels		yellow. Coarse sandy matrix, occasional small gravel clasts. Well sorted.

Trench 3, section 1

Depth (BGL) (m)	Depth OD (m)	Thickness (cm/m)	Stratigraphy	Context	Description
0	39.03	0.35 m	Topsoil		10 YR 4/2 dark greyish brown. Loose sandy topsoil , with some large pebble inclusions. Poorly sorted.
Diffuse boundary					
0.35	38.68	0.25 m	Subsoil		5 YR 5/4 reddish brown. Sandy soil matrix with rounded and subrounded pebble inclusions. Poorly sorted.
Diffuse Boundary					
0.60	38.43	1.61 m	Terrace gravels		5 YR 5/8 yellowish red. Boyn Hill gravel formation; sandy silty clay matrix with large gravel inclusions; rounded and sub-angular. Well sorted. Occasional grey lenses of sandy silty clay .

Trench 4, section 1

Depth (BGL) (m)	Depth OD (m)	Thickness (cm/m)	Stratigraphy	Context	Description
0	39.13	0.45 m	Topsoil		10 YR 4/2 dark greyish brown. Loose sandy topsoil , with some large pebble inclusions. Poorly sorted.
Diffuse boundary					
0.45	38.68	0.30 m	Subsoil		5 YR 5/4 reddish brown. Sandy soil matrix with rounded and subrounded pebble inclusions. Poorly sorted.
Diffuse Boundary					
0.75	38.39	0.16 m	Terrace gravels		5 YR 5/8 yellowish red. Boyn Hill gravel formation; sandly slightly silty matrix with coarse gravel clasts. Vertical blocks of silty sands and gravels intermixed with no obvious boundaries. Occasional sandy lenses.
Diffuse Boundary					
0.58	38.55	0.20 m	Terrace gravels		5 YR 5/8 yellowish red. Coarse stony gravel with sandy matrix. Clasts are well rounded to sub-rounded.
Diffuse boundary					

Depth (BGL) (m)	Depth OD (m)	Thickness (cm/m)	Stratigraphy	Context	Description
0.60	38.53		Terrace gravels		10 YR 6/6 brownish yellow. Coarse sandy, slightly silty matrix, occasional small gravel clasts. Well sorted.

4. DISCUSSION AND RECOMMENDATIONS

Deposits were generally homogenised across the site; topsoil graded into quaternary sands and gravels at a minimum depth of 38.39 metres. Based on British Geological Survey data for the region this would suggest the gravel terrace can be attributed to the Boyn Hill formation. Peri-glacial features, including ice wedging, appear to be present in several locations.

Assessment of the sediment in this area agrees with the expected sequence based on other, similar sites in the locality and, as no artefacts or environmental material were discovered further sampling is not recommended for either environmental or geoarchaeological purposes.

APPENDIX 5: OASIS FORM

OASIS ID: preconst1-255577

Project details

Project name	An Archaeological and Geoarchaeological Evaluation on Land at 32 St James Lane, Horns Cross, Greenhithe, Dartford.
Short description of the project	An archaeological and geoarchaeological evaluation was undertaken by Pre-Construct Archaeology Ltd. (PCA) on land at 32 St James Lane, Horns Cross, Greenhithe, Kent prior to re-development of the site by Urban Enhance. The main aim of the evaluation was to look for Palaeolithic remains, due to the presence of Boyn Hill gravels. The evaluation was undertaken between 14th and 17th June 2016. No features or finds of archaeological interest were identified.
Project dates	Start: 14-06-2016 End: 17-06-2016
Any associated project reference codes	KSJL16 - Sitecode
Type of project	Field evaluation
Site status	None
Current Land use	Residential 1 - General Residential
Monument type	NONE None
Significant Finds	NONE None
Methods & techniques	"Sample Trenches"
Development type	Urban residential (e.g. flats, houses, etc.)
Prompt	Planning condition
Position in the planning process	After full determination (eg. As a condition)

Project location

Country	England
Site location	KENT DARTFORD STONE 32 St James Lane, Horns Cross
Postcode	DA9 9LG
Study area	0.2 Hectares
Site coordinates	TQ 5745 7411 51.443543175604 0.265868783072 51 26 36 N 000 15 57 E Point
Height OD / Depth	Min: 38.58m Max: 38.94m

Project creators

Name of Organisation	Pre-Construct Archaeology Ltd
Project brief originator	Kent County Council
Project design originator	Peter Moore
Project director/manager	Peter Moore
Project supervisor	Guy Seddon
Type of sponsor/funding body	Developer
Name of sponsor/funding body	Urban Enhance

Project archives

Physical Archive Exists?	No
Digital Archive recipient	Local Museum
Digital Contents	"Environmental","Stratigraphic","Survey","Worked stone/lithics"
Digital Media available	"Database","Images raster / digital photography","Spreadsheets","Survey","Text"
Paper Archive recipient	Local Museum
Paper Contents	"Environmental","Stratigraphic","Worked stone/lithics"
Paper Media available	"Context sheet","Map","Photograph","Plan","Report","Section","Survey","Unpublished Text"

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	An Archaeological and Geoarchaeological Evaluation on Land at 32 St James Lane, Horns Cross, Greenhithe, Dartford
Author(s)/Editor(s)	Seddon, G.
Date	2016
Issuer or publisher	Pre-Construct Archaeology Ltd

Place of issue or publication	Brockley, London
Description	A4 client report. Blue cover.

APPENDIX 6: KENT SMR FORM

Site name: 32 St James Lane		
Site address: Horns Cross, Greenhithe , Kent		
Summary: Prior to redevelopment for housing an archaeological and geoarchaeological evaluation was conducted at 32 St James Lane, Horns Cross, Kent. No finds or features of archaeological interest were observed during the exercise.		
District/Unitary: Dartford	**Parish:** ****	
NGR (centre of site: 8 figures): (NB if large or linear site give multiple NGRs) TQ 5745 7411		
Type of archaeological work (delete)		
Evaluation		
Date of recording: 14/06/2016 – 17/06/2016		
Unit undertaking recording: Pre-Construct Archaeology Ltd		
Geology: Boyn Hill Gravels		
Title and author of accompanying report: Assessment of an Archaeological and Geoarchaeological Evaluation on Land at 32 St James Lane, Horns Cross, Greenhithe, Dartford, Kent. Guy Seddon		
Summary of fieldwork results (begin with earliest period first, add NGRs where appropriate): No features or finds of archaeological interest were observed during the evaluation.		
Location of archive/finds: PCA Ltd		
Contact at Unit: Guy Seddon	**Date:** 22/06/2016	

P C A

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
THE GRANARY, RECTORY FARM
BREWERY ROAD, PAMPISFORD
CAMBRIDGESHIRE CB22 3EN
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