

**Archaeological and Geoarchaeological Evaluation Report
Stonehouse Hospital, London Road
Stone, Dartford, Kent**

**NGR: 556127 174010
(TQ 5612 7401)**

Planning Ref: DA/12/01517

**ASE Project No: 6179
Site Code: SHD13**

**ASE Report No: 2013266
OASIS id: archaeol6-163610**

By Hayley Nicholls

**With contributions by
Gemma Ayton, Luke Barber, C.R Batchelor, C.P Green,
Dawn Elise Mooney, Karine le Hégarat, Elke Raemen, Dr Beccy Scott**

November 2013

**Archaeological and Geoarchaeological Evaluation Report
Stonehouse Hospital, London Road
Stone, Dartford, Kent**

**NGR: 556127 174010
(TQ 5612 7401)**

Planning Ref: DA/12/01517

**ASE Project No: 6179
Site Code: SHD13**

**ASE Report No: 2013266
OASIS id: archaeol6-163610**

By Hayley Nicholls

**With contributions by
Gemma Ayton, Luke Barber, C.R Batchelor, C.P Green,
Dawn Elise Mooney, Karine le Hégarat, Elke Raemen, Dr Beccy Scott**

November 2013

**Archaeology South-East
Units 1 & 2
2 Chapel Place
Portslade
East Sussex
BN41 1DR**

**Tel: 01273 426830
Fax: 01273 420866
Email: fau@ucl.ac.uk**

Abstract

Archaeology South-East was commissioned by CgMs Consulting Limited to undertake an archaeological evaluation on land at Stonehouse Hospital, London Road, Stone, Dartford, Kent. Six evaluation trenches were excavated. Natural geological deposits comprising of firm mid brown-orange gravels with patches of light brown-yellow-grey, mid red-brown and mid orange-brown sands were encountered at a height of between 37.72m and 38.65m AOD.

Four of the six trenches investigated were devoid of archaeological features. An undated ditch was recorded in Trench 6 sealed by a chalk layer of mid-19th to early 20th century date. A pit in Trench 5 contained a small assemblage of finds of mid-19th to early 20th century date. No further archaeological features were observed.

Six geoarchaeological test pits were excavated at the end of Trenches 2, 3, 4, 5, 6 and 7 and a further section was recorded during partially exposing an air raid shelter. It was initially suspected that Loess deposits may have been exposed in the test pits which would have been of archaeological significance. However, particle size analysis (Appendix 1) has categorically proved that the sediments are a normal fine-grained component of a braided river sequence.

CONTENTS

1.0	Introduction
2.0	Archaeological Background
3.0	Archaeological Methodology
4.0	Results
5.0	The Finds
6.0	The Environmental Samples
7.0	Discussion and Conclusions

Bibliography
Acknowledgements

HER Summary Sheet
OASIS Form

APPENDIX

Particle Size Analysis Report

FIGURES

Figure 1:	Site location
Figure 2:	Site plan
Figure 3:	Trench 5; plan, section and photographs
Figure 4:	Trench 6; plan, section and photographs

TABLES

Table 1:	Quantification of site archive
Table 2:	Trenches 2 and 3 list of recorded contexts
Table 3:	Trenches 4 and 7 list of recorded contexts
Table 4:	Trench 5 list of recorded contexts
Table 5:	Trench 6 list of recorded contexts
Table 6:	Quantification of the finds
Table 7:	Residue Quantification
Table 8:	Flot Quantification

1.0 INTRODUCTION

1.1 Site Background

- 1.1.1 Archaeology South-East (ASE), the contracting division of the Centre for Applied Archaeology (CAA), Institute of Archaeology (IoA), University College London (UCL) was commissioned by CgMs Consulting Limited to undertake an archaeological evaluation on land at Stonehouse Hospital, London Road, Stone, Dartford, Kent (NGR: 556127 174010 147683; Figure 1).

1.2 Geology and Topography

- 1.2.1 The site is located on roughly flat ground at the junction of London Road and Cotton Lane, Stone, Dartford, Kent, approximately 330m to the north of Roman Watling Street. The site is bounded to the south by London Road, to the east by Cotton Lane, to the north by Victoria Park (a new residential development within the Stonehouse Hospital complex) and to the west by Invicta Road.
- 1.2.2 According to the current data from the British Geological Survey (BGS 2013) the underlying natural geology comprises Seaford chalk formation and Newhaven Chalk Formation with overlying superficial deposits of Boyn Hill Gravel.

1.3 Planning Background

- 1.3.1 A planning application (DA/12/01517) has been submitted to refurbish and convert Martin House, an existing building within the site area, and also construct 28 two-storey detached and semi-detached houses with roof accommodation, and one three storey-building comprising 12 flats. The proposals include associated garages, lay out parking spaces, amenity areas, estate road, footpaths and landscaping.
- 1.3.2 On the basis of present archaeological information, the Archaeological Officer for Dartford Borough Council recommended that the site be subject to a programme of archaeological work in order to clarify the historical and archaeological elements within the site. The results could then guide appropriate mitigation measures for the future development.
- 1.3.3 A brief detailing the site specific requirements for archaeological evaluation was issued by Kent County Council (KCC 2013).

1.4 Aims and Objectives

- 1.4.1 The aims stated in the brief (KCC 2013) were:
- To determine whether any significant archaeological remains would be affected by the development and if so what mitigation measures would be appropriate. Such measures could include further detailed archaeological excavation, historic buildings recording and/or an archaeological watching brief during construction work.

1.5 Scope of Report

- 1.5.1 The current report provides the results of the archaeological evaluation of the site carried out between the 17th and 21st October 2013. The fieldwork work was undertaken by Hayley Nicholls (Archaeologist) and Lukasz Miciak (Surveyor). The geoarchaeological fieldwork was undertaken by Dr Beccy Scott and Dr Matt Pope. The project was managed by Andy Leonard and Darryl Palmer (Fieldwork) and by Jim Stevenson and Dan Swift (Post-Excavation).

2.0 ARCHAEOLOGICAL BACKGROUND

2.1 Introduction

- 2.1.1 The following archaeological background is reproduced from the brief (KCC 2013), with due acknowledgement.

2.2 Period Overview

2.2.1 Palaeolithic

The site lies on Boyn Hill Gravels which have potential for rare and important evidence of early hominin activity. Recent geoarchaeological work to the north and south have suggested that Boyn Hill Gravels in this area represent an early Cold Stage deposit but clarification of this is necessary due to the limited understanding of Palaeolithic archaeology in this area.

2.2.2 Iron Age and Roman

Iron Age and Roman archaeology are known in the general area and recent investigations to the south have revealed possible prehistoric pits.

2.2.3 Post-Medieval

This area was formerly part of the Stonehouse Hospital, a Victorian and later mental asylum. Much of the site was part of landscaped gardens and horticultural structures may survive on site.

2.2.4 Modern

A WWII air raid shelter survives on site. This has been archaeologically recorded and assessed and is now due for demolition.

3.0 METHODOLOGY

3.1 Archaeological Methodology

- 3.1.1 The archaeological methodology was initially set out in the brief (KCC 2013). All work was carried out in accordance with this, the KCC Standard Specification for Archaeological Evaluation (KCC 2007) and in line with professional standards and guidelines (IfA 2009).
- 3.1.2 The evaluation comprised the excavation of five 10m x 1.8m trenches, and one 20m x 1.8m trench (Trench 5). Trench 1 was not excavated as previous to the arrival of ASE archaeologists on site the area had been extensively probed and excavated to more than 1m depth below ground level by demolition workers.
- 3.1.3 In addition, at the end of each trench, a geoarchaeological test pit was machine excavated to assess the gravels. A further section through the natural deposits was recorded where exposed during partially exposing an air raid shelter. This work was supervised by a geoarchaeologist and a Palaeolithic specialist and will be detailed in a separate report.
- 3.1.4 Two WW II air raid shelters were also partially exposed through machine excavation in order that their height and dimensions might be surveyed by Countryside Properties PLC.

3.2 Geoarchaeological Methodology

- 3.2.1 Four geoarchaeological test pits were excavated across the eastern side of the site, at the end of Trenches 4, 5 and 7, whilst a further section was recorded where exposed during plotting the air raid shelter near the access road. These allowed a record to be made of the top of the fluvial gravels exposed across the site. The base of sequence has not been reached in any previous boreholes.
- 3.2.2 An attempt was made to check for the presence of artefacts by “walking” the machined surface of the test pits as each spit was removed, as well as hand checking machine spoil and sections.

3.3 The Archive

- 3.3.1 Dartford Museum is currently unable to accept archaeological archives. The archive will continue to be held at the offices of Archaeology South-East until a suitable long term storage location can be identified. The contents of the archive are tabulated below (Table 1).

Number of Contexts	22
No. of files/paper record	1 file
Plan and sections sheets	1
Bulk Samples	1
Photographs	75
Bulk finds	1 box
Environmental flots/residue	1 box

Table 1: Quantification of site archive

4.0 ARCHAEOLOGICAL RESULTS

4.1 Overburden and Geology

- 4.1.1 The stratigraphic sequence was fairly consistent across the site. The uppermost deposit in the stratigraphic sequence comprised heavily rooted, humus-rich, dark black-brown sand silt topsoil. The deposit measured between 0.20m and 0.40m in thickness. A subsoil layer of heavily rooted mid brown-orange silt sand with frequent gravel inclusions underlay the topsoil and was encountered in the south-west end of the site, measuring between 0.20 and 0.30m in thickness. A subsoil deposit was not evident in the north-east of the site.
- 4.1.2 The undisturbed natural geology was encountered below the subsoil in the south-west half of the site, and directly below the topsoil in the north-east half of the site and comprised firm mid brown-orange gravels with patches of light brown-yellow-grey, mid red-brown and mid orange-brown sands. The natural deposits were encountered at depths of between 38.07m and 38.25m AOD at the south-west end of the site and at depths of between 37.72m and 38.65m AOD at the north-east end of the site.
- 4.1.3 Only two archaeological features were identified within the site area, comprising of a circular pit in Trench 5, and a north-north-west to south-south-east aligned ditch in Trench 6.
- 4.1.4 Modern disturbance was encountered in Trenches 2, 3, 4 and 5 penetrating the natural gravels. Extensive rooting was observed in all recorded deposits.

4.2 Trenches 2 and 3

- 4.2.1 Trench 2 measured 10m x 1.8m, orientated on a north-east to south-west alignment, and was targeted over the footprint of a proposed building in the south-west half of the site. An area of modern disturbance was identified towards the south-west end of the trench and an area of root disturbance was identified towards the north-east end of the trench, both penetrated the natural gravels. No archaeological finds or features were identified.
- 4.2.2 Trench 3 measured 12.5m x 1.8m, orientated on an east-north-east to west-south-west alignment, targeted over the footprint of two proposed buildings in the south-west half of the site. A modern service, which cut the natural gravels, was encountered along the length of the trench on a similar alignment. However, due to the depth of the service it was still possible to excavate down to the top of the underlying natural deposits. No archaeological finds or features were identified.
- 4.2.3 Due to the modern service mentioned above it was necessary to extend the trench by 2.5m to the west-south-west in order to excavate a geoarchaeological test pit to the required depth.

Context	Type	Description	Max. Length m	Max. Width m	Deposit Thickness m
201	LAYER	Topsoil	NA	NA	0.25
202	LAYER	Subsoil	NA	NA	0.3
203	LAYER	Natural	NA	NA	NA
301	LAYER	Topsoil	NA	NA	0.2 – 0.4
302	LAYER	Subsoil	NA	NA	0.2
303	LAYER	Natural	NA	NA	NA

Table 2: Trenches 2 and 3 list of recorded contexts

4.3 Trenches 4 and 7

4.3.1 Trench 4 measured 10m x 1.8m, orientated on a north-east to south-west alignment, and was targeted over the footprint of a proposed building in the north-east half of the site. A large modern cut was identified towards the centre of the trench and penetrated the natural gravels. No archaeological features were identified. The complete bowl of a clay tobacco pipe dating to c. 1800-1840 was retrieved from topsoil layer [4/001].

4.3.2 Trench 7 measured 10m x 1.8m, orientated on a north-west to south-east alignment, targeted over the footprint of a proposed building in the north-east half of the site. No archaeological finds or features were identified.

Context	Type	Description	Max. Length m	Max. Width m	Deposit Thickness m
401	LAYER	Topsoil	NA	NA	0.3
402	LAYER	Natural	NA	NA	NA
701	LAYER	Topsoil	NA	NA	0.25 – 0.35
702	LAYER	Natural	NA	NA	NA

Table 3: Trenches 4 and 7 list of recorded contexts

4.4 Trench 5

(Figure 3)

4.4.1 Trench 5 measured 20m x 1.8m, orientated on a north-east to south-west alignment, targeted over the footprint of two proposed buildings in the north-east half of the site.

4.4.2 The stratigraphic sequence in Trench 5 varied slightly from elsewhere within the site with a possible layer of buried topsoil [5/003] directly overlying the natural gravels. This deposit consisted of mid brown-grey silt sand, which was in turn overlaid by a modern made-ground layer of mid orange-brown sandy gravel [5/002] and subsequently a layer of topsoil [5/001]. A narrow modern service cutting the natural gravels was encountered close to the centre of the trench.

4.4.3 A single archaeological feature was encountered towards the south-west end of the trench and comprised a regular, circular pit [5/005]. The pit cut had vertical edges, a flat base, a diameter of 0.7m and a depth of 0.38m. The cut was filled with mid-brown-grey silt sand with frequent gravel inclusions [5/006]. Two circular iron hoops, similar to those on a barrel sat within the fill, against the edge of the cut approximately 0.10m apart.

4.4.4 The pit [5/005] contained a small assemblage of finds including a brick fragment, sherds of pottery, and a small fragment of clay tobacco pipe. Taken as a group, a mid-19th to early 20th century deposition date is probable.

Context	Type	Description	Max. Length m	Max. Width m	Deposit Thickness m
501	LAYER	Topsoil	NA	NA	0.2 – 0.4
502	LAYER	Made ground	>3.0	>1.8	0.3
503	LAYER	Buried topsoil?	>3.0	>1.8	0.2
504	LAYER	Natural	NA	NA	NA
505	CUT	Pit	0.7	0.7	0.38
506	FILL	Fill of [505]	0.7	0.7	0.38

Table 4: Trench 5 list of recorded contexts

4.5 Trench 6

(Figure 4)

4.5.1 Trench 6 measured 10m x 1.8m, orientated on a north-east to south-west alignment, targeted over the footprint of a proposed building in the north-east half of the site.

4.5.2 The stratigraphic sequence in Trench 6 varied slightly from elsewhere within the site with a light grey-white silt-sand-chalk layer [6/003] directly overlying the natural gravels. This deposit contained a fragment of yellow stock brick of mid-19th to early 20th century date. A made-ground layer comprising of mid orange-brown sandy gravel with occasional chalk inclusions [6/002] overlay chalky layer [6/003] and was in turn overlaid by a layer of topsoil [6/001].

4.5.3 A single archaeological feature was encountered towards the north-east end of the trench sealed by chalky layer [6/003] and comprised a north-north-west to south-south-east aligned linear ditch [6/004]. The ditch cut had c. 45° edges, a flat base, a width of 1.55m and a depth of 0.40m. The cut was filled with mid-orange-brown silt sand with frequent gravel inclusions [6/005].

4.5.4 No dating evidence was retrieved from ditch fill [6/005].

Context	Type	Description	Max. Length m	Max. Width m	Deposit Thickness m
601	LAYER	Topsoil	NA	NA	0.25 – 0.3
602	LAYER	Made-ground	>7	>1.8	0.1
603	LAYER	Chalky deposit	>7	>1.8	0.08 – 0.09
604	CUT	Ditch	>1.8	1.55	0.4
605	FILL	Fill of [604]	>1.8	1.55	0.4
606	LAYER	Natural	NA	NA	NA

Table 5: Trench 6 list of recorded contexts

5.0 GEOARCHAEOLOGICAL RESULTS

5.1 GTP 1

- 0 – 0.3m Dark grey-brown humic sandy loam – very heavily rooted. Loose, fine-moderate.
- 0.3 – 0.55m Orange-brown dirty clay-rich sand, very heavily rooted: **redeposited**.
- 0.55 – 0.8m Very fine, light yellow-brown sandy silt, becoming increasingly clay-rich towards base and more compact. Lower part contains c. 10% rounded tertiary pebbles and occasional (<5%) angular gravel, <20 in diameter. Heavily affected by rooting. Sample retained for particle size analysis.
- 0.8 – 1.10m Sandy gravel. Fine, yellow-brown, loose silty sand matrix containing 30% small round tertiary pebbles and 20% small angular flint gravel. 10-50mm diameter, average 30mm. Affected by rooting.
- 1.10 – 1.40m Sandy gravel. Loose, dark red-orange coarse clayey sand matrix with 70% small rounded flint pebbles (including tertiaries) < 20mm diameter, 20% 20-50 mm diameter, and 10% >50 mm diameter.

5.2 GTP 2

- 0 – 0.25m Topsoil. Dark grey-brown loose sandy humic topsoil.
- 0.26 – 0.5m Made ground. Dark grey-brown coarse clayey-sand matrix with angular and rounded small flint pebbles (40%, < 30 mm diameter) towards base. Fairly compact.
- 0.51 – 0.8m Sandy Gravel. Loose, coarse light yellow-brown sand matrix. 40% small rounded flint pebbles (including tertiaries) < 30 mm diameter, 10% > 30mm diameter.
- 0.81 – 1.18m Gravel. Compact, coarse, clay rich orange-red sandy matrix, increasingly compact and clay-rich towards base. 60% small rounded flint pebbles, some angular, < 30 mm diameter; 20% 30-50 mm diameter.
- 1.19 – 1.28m Sand. Compact, coarse, clay rich dark orange clay rich sand; more clay rich at top and base. OSL sample attempted but could not be successfully extracted.

5.3 GTP 3

- 0 – 0.4m Topsoil. Dark grey-brown loose sandy humic topsoil.
- 0.41 – 0.52m Gravelly Sand. Light faun to brown medium sand, loose to moderate, with frequent (30%) small (<30mm diameter) rounded and sub-rounded flint pebbles towards base.

0.53 – 0.72m Gravel. Loose to moderate flint gravel in light faun to brown medium sand matrix; 70% small (<30mm diameter) rounded and sub-rounded flint pebbles.

0.73 – 0.92m Silt. Very fine pale yellow fine slightly sandy silt within hollow in top of sand below. Moderate-compact.

0.93 – 1.0m Sandy gravel. Compact, clay-rich, coarse, red-brown sand with 70% small, rounded and sub-angular flint gravel (<30mm).

5.4 GTP 4

0-.5m Topsoil. Very dark grey-brown sandy humic loam.

0.51 - 0.73m Sandy Gravel. Moderately coarse loose yellow-orange sandy matrix with 50% small round and sub-angular flint pebbles (<30mm). Very heavily rooted.

0.73 - 1.0m Sandy Gravel. Moderately coarse loose light grey sandy matrix with 50% small round and sub-angular flint pebbles (<30mm). Very heavily rooted.

1.0 - 1.2m Sandy silt. Fine, pale faun sandy silt - discontinuous, infilling patches in orange sand below.

Base of trench Gravelly Sand. Coarse orange-brown clay-rich sand with 30% small (<30mm) and medium (30-50mm) rounded and sub-angular flint gravel.

5.5 GTP 5

0 – 0.3m Dark grey-brown humic sandy loam . Loose, fine-moderate.

0.3 – 0.4m Made Ground: Orange-brown, clay-rich sand, including redeposited gravels.

0.4 – 1.2m (north edge) Fine, yellow-brown, loose silty sand. Appears to overly gravels (see below). Redeposited Loess?

0.4 – 1.2m Sandy Gravel.. Light yellow-brown sand to sandy silt. Contains c. 80% rounded tertiary pebbles and occasional (<5%) angular gravel, <20 in diameter.

5.6 GTP 6

0 – 0.3m Dark grey-brown humic sandy loam . Loose, fine-moderate.

0.3 – 0.4m Made Ground: Orange-brown clayey sand, including redeposited gravels.

0.4 – 16m Sandy gravel. Loosely consolidated Medium Sand with 85% rounded tertiary flint, bioturbation and rooting.

0.4 – 1.2m Sandy Gravel. As above but consolidated.

5.7 GTP 7

0.0 – 0.45m Made Ground: Orange-brown clayey sand, including redeposited gravels.

- 0.4 – 16m Sandy gravel. Loosely consolidated , Medium Sand with 70% rounded tertiary flint, Heavily bioturbated and rooted.
- 0.4 – 1.1m Sandy Gravel. As above but consolidated.

5.8 Description of sequence.

- 5.8.1 The sequence comprises beds of sand-rich fluvial gravels with occasional silt and fine sandy lenses. The gravels are uniformly small (generally <30mm) and matrix-supported, reflecting fairly quiescent conditions.
- 5.8.2 Within one area (GTP1), the gravels appeared to be overlain by a fine sandy silt, clay rich at the base, which was superficially similar to wind blown loess deposits although could reflect overbank flooding, or later colluviation (see Particle Size Analysis Report, Appendix).

6.0 The Finds

6.1 Introduction

- 6.1.1 A small assemblage of finds was recovered during the archaeological work (Table 6). Finds were all washed and dried or air dried as appropriate. They were quantified by count and weight and bagged by material and context. Finds were all packed and stored according to IFA guidelines (2008) and no further conservation is required. One of the two clay tobacco pipe fragments retained maker's marks and was assigned a registered finds number.

Context	Pottery	Wt (g)	CBM	Wt (g)	Bone	Wt (g)	Fe	Wt (g)	CTP	Wt (g)	Slag	Wt (g)	Glass	Wt (g)
4/001									1	10				
5/006	2	22	1	2132	2	10	4	94	1	<2	5	120	6	54
6/003			1	900										
Total	2	22	2	3032	2	10	4	94	2	10	5	120	6	54

Table 6: Quantification of the finds

6.2 The Post-Roman Pottery by Luke Barber

- 6.2.1 The only pottery recovered from the site consists of two body sherds from unglazed earthenware flower pots (context [5/006]). Two different vessels are represented, one heavier and more abraded, the other lighter and fresh. Only a general 19th- to early 20th- century date can be ascribed to these sherds.

6.3 CBM by Luke Barber

- 6.3.1 Two brick fragments were recovered from the site. That from [5/006] consists of a well formed and fired buff/dull yellow refractory brick with granular fabric containing a little flint (2025g). The brick measures 235mm long by 61mm thick with a width in excess of 90mm. One stretcher face has been heavily eroded and burnt. A 19th- to early 20th- century date is probable. The other brick fragment was recovered from [6/003] (861g). This consists of a crudely formed, medium fired dull yellow stock brick with moderate slag tempering to 4mm. The brick, which is 107mm wide by 65mm thick, has a crudely formed frog and is probably of mid-19th to early 20th century date.

6.4 The Glass by Elke Raemen

- 6.4.1 Six glass fragments were recovered from [5/006]. Included are five conjoining fragments from a small, colourless square bottle (base 36 by 36mm). Pieces date to the mid-19th to early 20th century and are probably from an ink bottle. A colourless fragment from a rectangular window pane was also recovered and is of the same date.

6.5 The Ironwork by Elke Raemen

- 6.5.1 A small assemblage comprising three heavy duty nails and a strip fragment was recovered from [5/006]. Nails measure 105 to 107mm long and are all rectangular-sectioned with rectangular-sectioned heads (13 by 9mm). Although too corroded to establish manufacturing method, they are probably of late post-medieval date. The

strip fragment in addition measures 90mm+ long, 21mm wide and 3.3mm thick.

6.6 The Metallurgical Remains by Luke Barber

- 6.6.1 Context [5/006] produced five pieces of material classified as slag during quantification. There are two pieces (61g) of unabraded fuel ash slag, quite dense, brittle and with notable bubbling, almost certainly waste from coal burning. The 5g fragment of black aerated clinker is also waste from coal burning. There are also two pieces (49g) of bitumen/tarmac with crushed limestone aggregate suggesting a date in the later 19th or early 20th centuries.

6.7 The Registered Finds by Elke Raemen

- 6.7.1 Two marked clay pipe fragments were recovered. Context [4/001] contained a complete bowl dating to c. 1800-1840. A second piece, recovered from [5/006], consists of a stem with tree moulding and incuse maker's stamp. The stamp reads "PLUMSTEAD" and "H. DUDMA[...]" which refers to H. Dudman, working in Plumstead around 1860 (Oswald 1975, 135).

6.8 The Animal Bone by Gemma Ayton

- 6.7.1 Just two fragments of animal bone were recovered both of which derive from context [5/006]. The specimens have been identified as a rib and a vertebra fragment from a medium-sized mammal. No evidence of burning, gnawing or pathology has been noted though the vertebrae specimen has been sliced down the medial axis, a process often undertaken during carcass dismemberment.
- 6.7.2 Due to the size and condition of the bone assemblage, it holds no potential for further analysis

7.0 THE ENVIRONMENTAL SAMPLES by Dawn Elise Mooney & Karine le Hégarat

7.1 Introduction and Methodology

7.1.1 During evaluation work at the site, a single bulk soil sample was taken to recover environmental remains such as charred plant macrofossils, wood charcoal, fauna and mollusca, and to assist finds recovery. Sample <1> was taken from the fill [6/005] of linear ditch [6/004] and measured 40 litres in volume.

7.1.2 The sample was processed by flotation at Archaeology South-East, Portslade, East Sussex. Flots and residues were retained on 500µm and 300µm meshes respectively, and air dried. The dried residues were passed through graded sieves of 8mm, 4mm and 2mm and each fraction sorted for environmental and artefactual remains (Table 7). The dry flots and the wet sieved fractions were scanned under a stereozoom microscope at 7-45x magnifications and their contents recorded (Table 7). Identifications of macrobotanical remains have been made through comparison with published reference atlases (Cappers *et al.* 2006, Jacomet 2006, NIAB 2004), and nomenclature used follows Stace (1997).

7.2 Results

7.2.1 The flot was large, but dominated by uncharred modern vegetation consisting mainly of roots but also seeds of common fumitory (*Fumaria officinalis*) and bedstraw (*Galium* sp.). Charred macrobotanical remains were rare, and charcoal was only represented by a small quantity of small-sized fragments <2mm. Three charred cereal grains (Cerealia) were recorded, two of which were identified as barley (*Hordeum* sp.). These grains were small-sized. A single charred vetch/pea (*Vicia/Lathyrus*) seed was also recovered. The charred plant macrofossils were generally abraded and poorly-preserved.

7.2.2 The residue contained very few charred plant remains, mostly charcoal fragments <4mm. A single land snail shell was recorded, along with struck flint, pottery, burnt flint, and a large quantity of magnetised material.

7.3 Discussion

7.3.1 As the sample was taken from the fill of a ditch, the charred material contained therein is likely to originate from a variety of different burning events, and may have arrived by secondary deposition. The assemblage of botanical remains recorded was very limited. Diet was represented by three charred barley grains, which are likely to have been used as a foodstuff or in the production of beer. The presence of vetch/pea indicates the presence of grassland or hedgerow environments, possibly on the fringes of arable fields.

7.3.2 Overall, the charred plant macrofossil assemblage recovered from the sample is very limited, and is of low significance to the narrative of the site. The large quantities of modern root material found in the sample suggest that the sediment is likely to have been disturbed through bioturbation. However, sampling has confirmed the presence of charred macrobotanical remains, and therefore bulk soil samples should continue to be taken from promising deposits during any future archaeological work at the site.

Sample Number	Context	Context / deposit type	Sample Volume litres	Sub-Sample Volume litres	Charcoal >4mm	Weight (g)	Charcoal <4mm	Weight (g)	Land Snail shells	Weight (g)	Other (eg ind, pot, cbm)
1	6/005	Ditch	40	40	*	<2	*	<2	*	<2	Magnetised material ****/12g - Flint */14g - Pot */8g - FCF **/170g

Table 7: Residue quantification (* = 1-10, ** = 11-50, *** = 51-250, **** = >250) and weights in grams

Context	Weight g	Flot volume ml	Volume scanned	Uncharred %	Sediment %	Seeds uncharred	Charcoal >4mm	Charcoal <4mm	Charcoal <2mm	Crop seeds charred	Identifications	Preservation	charred	Identifications	Preservation	Land Snail Shells
6/005	32	500	500	98	-	* <i>Fumaria officinalis</i> (1), <i>Galium</i> sp. (1)			*	*	<i>Hordeum</i> sp. (1), cf. <i>Hordeum</i> sp. (1), Cereal ia (1)	+	*	<i>Vicia / Lathyrus</i> sp. (1)	+	*

Table 8: Flot quantification (* = 1-10, ** = 11-50, *** = 51-250, **** = >250) and preservation (+ = poor, ++ = moderate, +++ = good)

8.0 DISCUSSION AND CONCLUSIONS

8.1 Archaeological discussion

- 8.1.1 The stratigraphic sequence was fairly consistent across the site. The uppermost deposit in the stratigraphic sequence comprised heavily rooted, humus-rich, dark black-brown sand silt topsoil. A heavily rooted subsoil layer underlay the topsoil and was encountered in the south-west end of the site. A subsoil deposit was not evident in the north-east of the site.
- 8.1.2 Four of the six trenches investigated were devoid of archaeological features.
- 8.1.3 Two archaeological features were identified within the site area, comprising of a circular pit identified in Trench 5, and a north-north-west to south-south-east aligned ditch in Trench 6.
- 8.1.4 The ditch in Trench 6 contained no dating evidence but was sealed by a chalk layer of mid-19th to early 20th century date. The pit in Trench 5 contained a small assemblage of finds also of mid-19th to early 20th century date.
- 8.1.5 No further archaeological features were observed within the site area.

8.2 Geoarchaeological conclusions

- 8.2.1 No artefacts or fauna were observed during the course of the machine excavation of the geoarchaeological test pits.
- 8.2.2 The sandy gravels present across the entire site reflect fairly quiescent sedimentation, and occasionally (silt and fine sand lens) very low energy conditions.
- 8.2.3 Although the test pits did not extend through the complete fluvial sequence or expose the platform with the solid geology, a provisional correlation with the MIS 11 Boyn Hill terrace is suggested on the basis of surface ground altitude.

8.3 Consideration of possible Loess deposit by C.R Batchelor and C.Green (QUEST)

- 8.3.1 It is very clear from visual inspection and particle size analysis that the sample does not contain a sufficiently high silt content to be classified as loess. This interpretation is supported by observations in the field: the stone content in the lower part of the unit is difficult to reconcile with loess deposition and there is no suggestion in the field description of a stratigraphic boundary between this lower stony sub-unit and the overlying stoneless, sandy silt. Furthermore, silty units are also present in test pits GTP3 ('slightly sandy silt') and GTP4 ('sandy silt') apparently texturally no different from the unit analysed in GTP1, but overlain and underlain by gravel units and therefore appearing to be part of the normal fine-grained component of a braided river sediment sequence. (Full report is appended).

BIBLIOGRAPHY

British Geological Survey 2013

<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

Bridgland, D 2003. The evolution of the River Medway, SE England, in the context of Quaternary palaeoclimate and the Palaeolithic occupation of NW Europe. *Proceedings of the Geologists Association* 114, pp 23-48

Cappers, R.T.J, Bekker, R.M., & Jans, J.E.A. 2006. *Digital Seed Atlas of the Netherlands*. Groningen Archaeological Series 4. Netherlands: Barkhuis

English Heritage 2002. *Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation and Geoarchaeology: Using earth sciences to understand the archaeological record*

English Heritage 2008. *Management of Research Projects in the Historic Environment (MoRPHE), Project Planning Notes 3 (PPN3): Archaeological Excavation*

Gale, R. & Cutler, D. 2000. *Plants in Archaeology*. Otley/London: Westbury/Royal Botanic Gardens, Kew.

Institute of Archaeologists, 2008 IFA Standard and Guidance for the collection, documentation, conservation and research of archaeological materials, accessed on 09/08/13

http://www.archaeologists.net/sites/default/files/nodefiles/ifa_standards_materials.pdf

Hather, J. G. 2000. *The Identification of the Northern European Woods: A Guide for archaeologists and conservators*. London: Archetype Publications Ltd.

Jacomet, S. 2006. *Identification of cereal remains from archaeological sites*. 2nd edition. Unpublished manuscript: Archaeobotany Laboratory, IPAS, Basel University.

Kent County Council 2007. *Standard Specification for an Archaeological Evaluation*

Kent County Council 2013. Specification for Stonehouse Hospital (Quintain land), London Road, Stone, Dartford, Kent

MoLAS 1994. *Site Manual for Archaeological Fieldwork*

NIAB. 2004. *Seed Identification Handbook: Agriculture, Horticulture and Weeds*. 2nd edition. Cambridge: National Institute of Agricultural Botany.

Oswald A. 1975 *Clay Pipes for the Archaeologist* (BAR 14), Oxford.

Schoch, W., Heller, I., Schweingruber, F. H., & Kienast, F. 2004. *Wood anatomy of central European Species*. Online version: www.woodanatomy.ch

Stace, C. 1997. *New Flora of the British Isles*. Cambridge: University Press

ACKNOWLEDGEMENTS

ASE would like to thank CgMs Consulting Ltd. for commissioning the work and for their assistance throughout the project, and Wendy Rogers County Archaeologist for Kent County Council for her guidance and monitoring.

HER Summary Form

Site Code	SHD13					
Identification Name and Address	Stonehouse Hospital, London Road, Stone, Dartford,					
County, District &/or Borough	Kent					
OS Grid Refs.	556127 174010					
Geology	Seaford chalk formation and Newhaven chalk formation with overlying superficial deposits of Boyn Hill gravel member					
Arch. South-East Project Number	6179					
Type of Fieldwork	Eval.					
Type of Site		Shallow Urban				
Dates of Fieldwork	Eval. 17/10/13 – 21/10/13					
Sponsor/Client	CgMs					
Project Manager	Andy Leonard and Daryl Palmer					
Project Supervisor	Hayley Nicholls					
Period Summary						
			PM	Other		
<p>Summary</p> <p>Archaeology South-East was commissioned by CgMs Consulting Limited to undertake an archaeological evaluation on land at Stonehouse Hospital, London Road, Stone, Dartford, Kent. Six evaluation trenches were excavated. Natural geological deposits comprising of firm mid brown-orange gravels with patches of light brown-yellow-grey, mid red-brown and mid orange-brown sands were encountered at a height of between 37.72m and 38.65m AOD.</p> <p>Four of the six trenches investigated were devoid of archaeological features. An undated ditch was recorded in Trench 6 sealed by a chalk layer of mid-19th to early 20th century date. A pit in Trench 5 contained a small assemblage of finds of mid-19th to early 20th century date. No further archaeological features were observed.</p> <p>Six geoarchaeological test pits were excavated at the end of Trenches 2, 3, 4, 5, 6 and 7 and a further section was recorded during partially exposing an air raid shelter. It was initially suspected that Loess deposits may have been exposed in the test pits which would have been of archaeological significance. However, particle size analysis (Appendix 1) has categorically proved that the sediments are a normal fine-grained component of a braided river sequence.</p>						

OASIS Form

OASIS ID: archaeol6-163610

Project details

Project name Stonehouse Hospital, London Road, Dartford

Short description
of the project

Archaeology South-East was commissioned by CgMs Consulting Limited to undertake an archaeological evaluation on land at Stonehouse Hospital, London Road, Stone, Dartford, Kent. Six evaluation trenches were excavated. Natural geological deposits comprising of firm mid brown-orange gravels with patches of light brown-yellow-grey, mid red-brown and mid orange-brown sands were encountered at a height of between 37.72m and 38.65m AOD.

Four of the six trenches investigated were devoid of archaeological features. An undated ditch was recorded in Trench 6 sealed by a chalk layer of mid-19th to early 20th century date. A pit in Trench 5 contained a small assemblage of finds of mid-19th to early 20th century date. No further archaeological features were observed.

Six geoarchaeological test pits were excavated at the end of Trenches 2, 3, 4, 5, 6 and 7 and a further section was recorded during partially exposing an air raid shelter.

It was initially suspected that Loess deposits may have been exposed in the test pits which would have been of archaeological significance. However, particle size analysis (Appendix 1) has categorically proved that the sediments are a normal fine-grained component of a braided river sequence.

Project dates Start: 17-10-2013 End: 21-10-2013

Previous/future
work Yes / Yes

Any associated
project reference
codes SHD13 - Sitecode

Any associated
project reference
codes DA/12/01517 - Planning Application No.

Type of project Field evaluation

Site status None

Current Land use Vacant Land 1 - Vacant land previously developed

Monument type PIT Post Medieval

Monument type PIT Modern

Monument type DITCH Post Medieval

Monument type DITCH Modern

Significant Finds	CLAY PIPE Post Medieval
Methods & techniques	"Annotated Sketch", "Environmental Sampling", "Targeted Trenches"
Development type	Urban residential (e.g. flats, houses, etc.)
Prompt	Direction from Local Planning Authority - PPS
Position in the planning process	Between deposition of an application and determination

Project location

Country	England
Site location	KENT DARTFORD STONE Stonehouse Hospital, London Road, Stone, Dartford
Postcode	DA2 6AW
Study area	1.40 Hectares
Site coordinates	TQ 5612 7401 51 0 51 26 34 N 000 14 48 E Point
Lat/Long Datum	Unknown
Height OD / Depth	Min: 37.72m Max: 38.65m

Project creators

Name of Organisation	Archaeology South-East
Project brief originator	Kent County Council
Project design originator	Kent County Council
Project director/manager	Andy Leonard/Darryl Palmer
Project supervisor	Hayley Nicholls
Type of sponsor/funding body	CgMs Consulting
Name of sponsor/funding body	CgMs Consulting

Project archives

Physical Archive recipient	Dartford Museum
Physical Contents	"Animal Bones", "Ceramics", "Environmental", "Glass", "Metal"

Digital Archive recipient	Dartford Museum
Digital Contents	"Animal Bones", "Ceramics", "Environmental", "Glass", "Metal", "Survey"
Digital Media available	"GIS", "Images raster / digital photography", "Survey", "Text"
Paper Archive recipient	Dartford Museum
Paper Contents	"Animal Bones", "Ceramics", "Environmental", "Glass", "Metal", "Survey"
Paper Media available	"Context sheet", "Correspondence", "Drawing", "Map", "Plan", "Report", "Section"

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Archaeological Evaluation Report Stonehouse Hospital, London Road, Stone, Dartford Kent
Author(s)/Editor(s)	Nicholls, H.
Other bibliographic details	2013266
Date	2013
Issuer or publisher	ASE
Place of issue or publication	Portslade

Entered by	Hayley Nicholls (h.nicholls@ucl.ac.uk)
Entered on	6 November 2013

APPENDIX

STONE HOUSE HOSPITAL, LONDON ROAD, STONE, DARTFORD, KENT: PARTICLE SIZE ANALYSIS REPORT

C.P. Green & C.R. Batchelor

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

INTRODUCTION

This report summarises the findings arising out of the particle size analysis undertaken by Quaternary Scientific (QUEST), University of Reading on a sample taken from the upper part of the sedimentary sequence in geoarchaeological test pit 1 (GTP1) at Stone House Hospital, London Road, Stone, Dartford (site code: SHD13). Within the field the sediment from which this sample came (0.55 to 0.8m below ground surface), was described as a 'very fine, light yellow-brown sandy silt, becoming increasingly clay-rich towards base and more compact; the lower part contains c. 10% rounded tertiary pebbles and occasional (<5%) angular gravel, <20 in diameter. Heavily affected by rooting', and was initially and interpreted as either a loess, overbank or colluvial deposit (Scott, 2013). Pure loess (i.e. genuine undisturbed windblown sediment) is very rare in Britain, and thus its potential presence at Stone House Hospital may have significance. Furthermore, if the sample is representative of an overbank or loess environment, it was considered to have some potential to preserve *in situ* Pleistocene or early Holocene archaeological remains (Scott, 2013).

In order to elucidate whether or not the sediment was deposited within a wind-blown (loess) environment, particle size analysis was undertaken. This technique is a standard sedimentological technique used to characterize the physical properties of a soil or sediment, provides important clues to sediment provenance, transport history and offers a potentially useful means of 'fingerprinting' soils and sediments for purposes of comparison (Blott *et al* 2004).

METHODS

Particle size analysis

Prior to particle size distribution analysis by laser granulometry (range 0.01-2000 microns) a representative sample was gathered from the main sample (sediment >2000 microns was semi-quantitatively recorded by eye). The sample is then mixed with a spatula to form a homogenous 'paste'. A sub-sample was placed on a plastic

watchglass and a weak dispersant solution (c. 0.5ml 3.3% Calgon) was added in order to aid dispersion of the material (Blott et al 2004). Physical disaggregation on a clean watchglass with a rubber pestle was carried out. Any particles observed to be greater than 2mm were removed. The sample was then washed with distilled water into the analyser. Particle size distribution measurements for particles falling within the size range 0.01 to 2000 microns was measured by laser granulometry using a Malven Mastersizer 3000. The results are displayed in Figure 1.

RESULTS AND INTERPRETATION OF THE PARTICLE SIZE ANALYSIS

Visual inspection of the sample revealed a gravel content of 10-15%. Particle size analysis of the non-gravel component of the sample has revealed it comprises approximately 1% coarse sand, 50% fine-medium sand, 49% silt and <1% clay (Figure 1).

Wind-blown dust deposits (loess) have a very high silt component (approximately 90%). It is therefore very clear from visual inspection and particle size analysis that the sample does not contain a sufficiently high silt content to be classified as loess. This interpretation is supported by observations in the field: the stone content in the lower part of the unit is difficult to reconcile with loess deposition and there is no suggestion in the field description of a stratigraphic boundary between this lower stony sub-unit and the overlying stoneless, sandy silt. Furthermore, silty units are also present in test pits GTP3 ('slightly sandy silt') and GTP4 ('sandy silt') apparently texturally no different from the unit analysed in GTP1, but overlain and underlain by gravel units and therefore appearing to be part of the normal fine-grained component of a braided river sediment sequence.

REFERENCES

Blott, S, Croft, D.J, Pye, K, Sayene, S.E, and Wilson, H.E. (2004) Particle Size Analysis by Laser Diffraction. *Forensic Geoscience: Principles, Techniques and Applications* 232, 63-73

Scott, R. (2013) Stone House Hospital, Dartford: Site visit 17/10/13. Unpublished report.

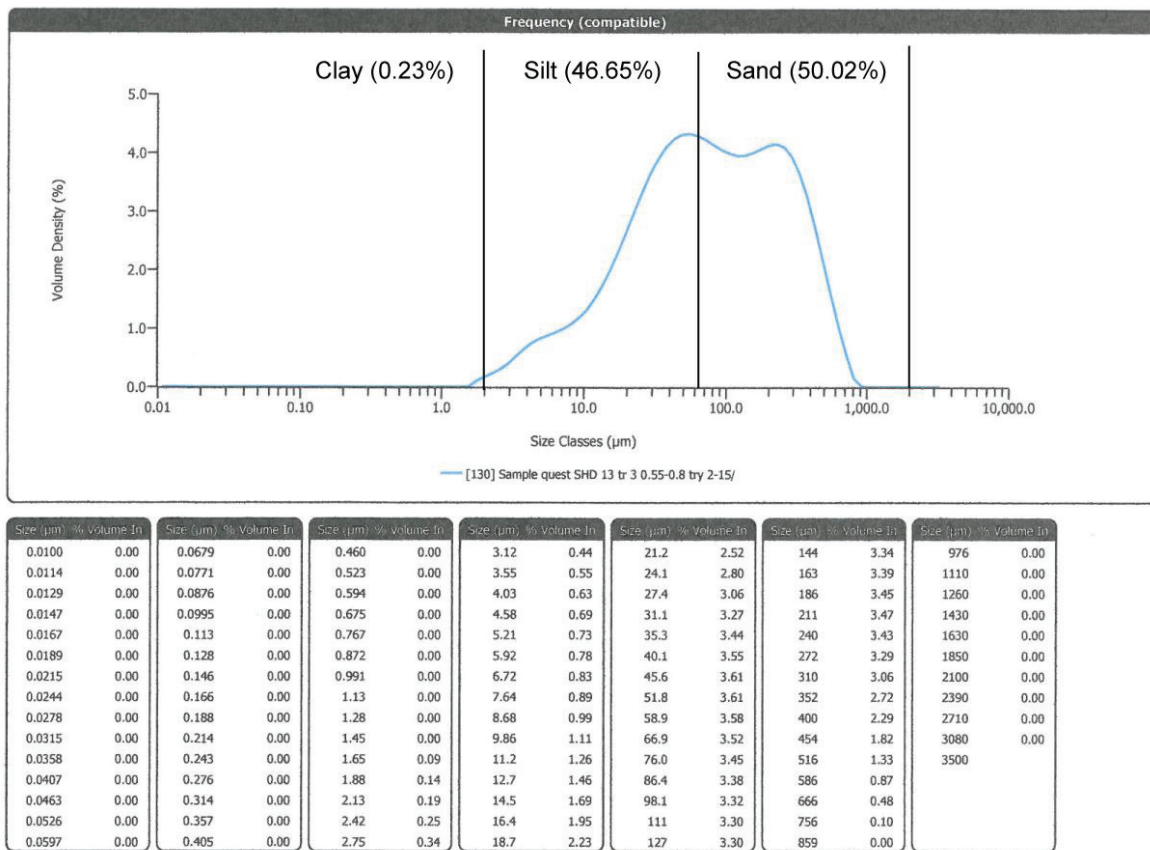
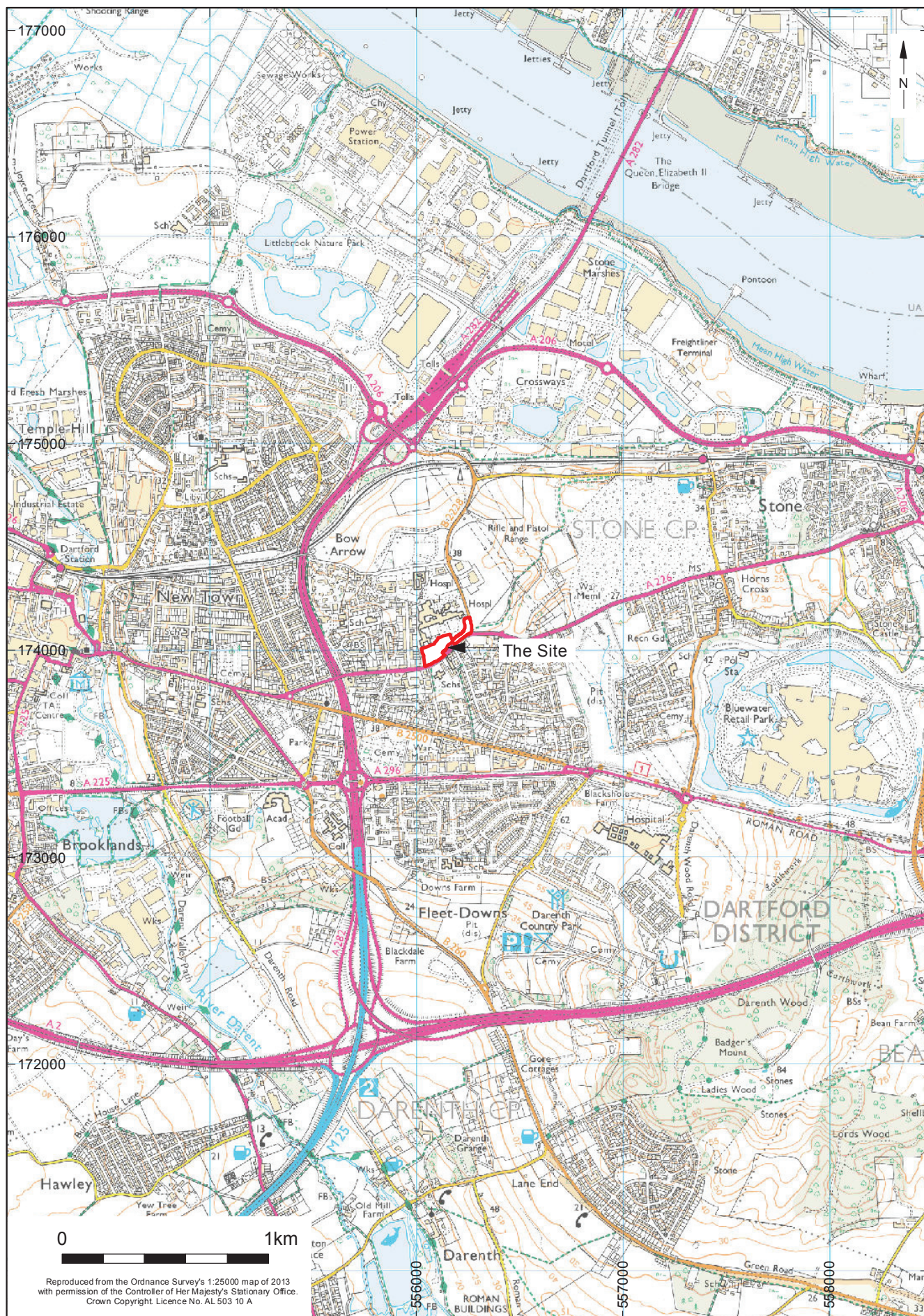


Figure 1: Results of the particle size analysis



© Archaeology South-East

Project Ref: 6179

October 2013

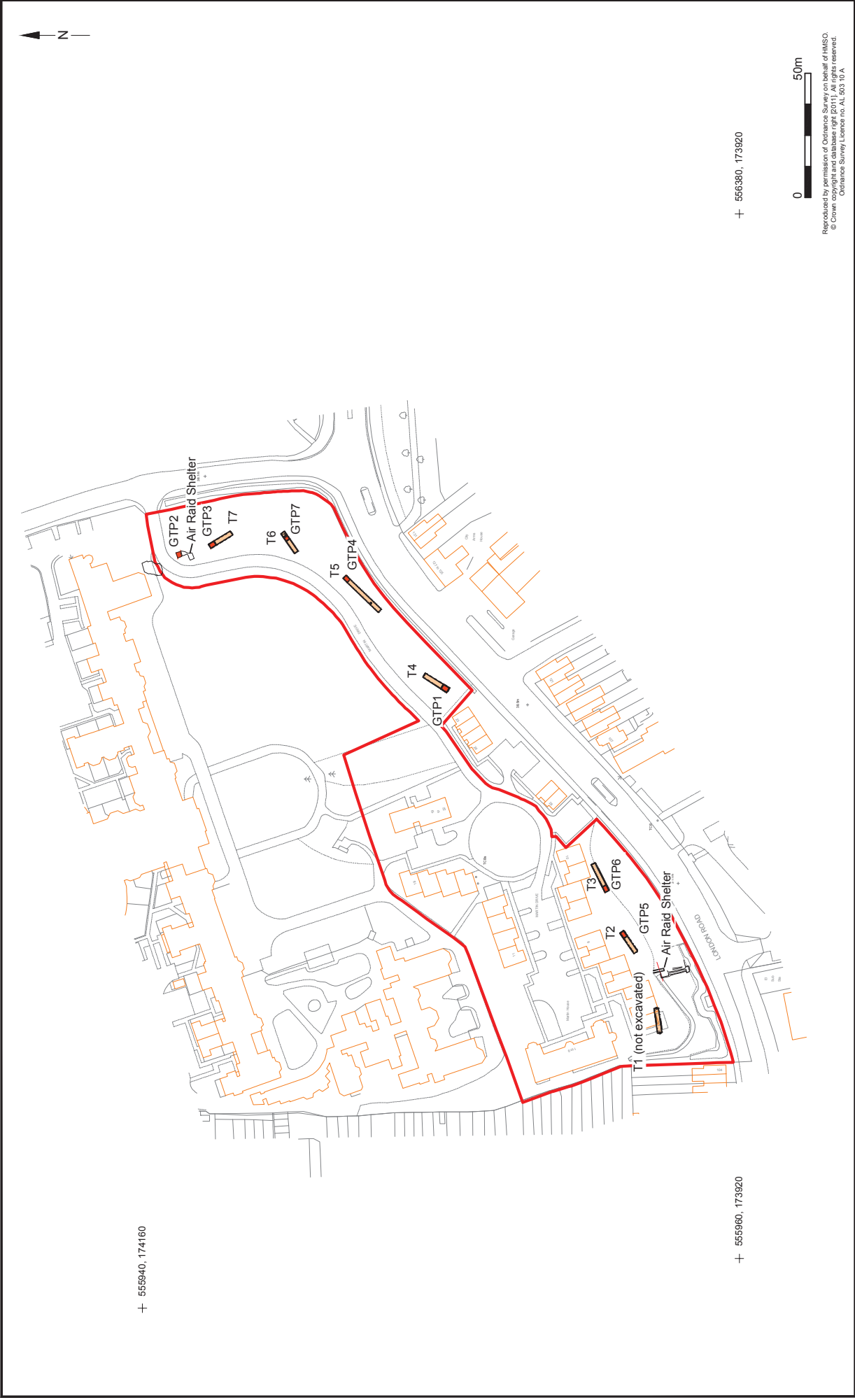
Report Ref: 2013266

Drawn by: AR

Stonehouse Hospital, London Road, Stone, Dartford

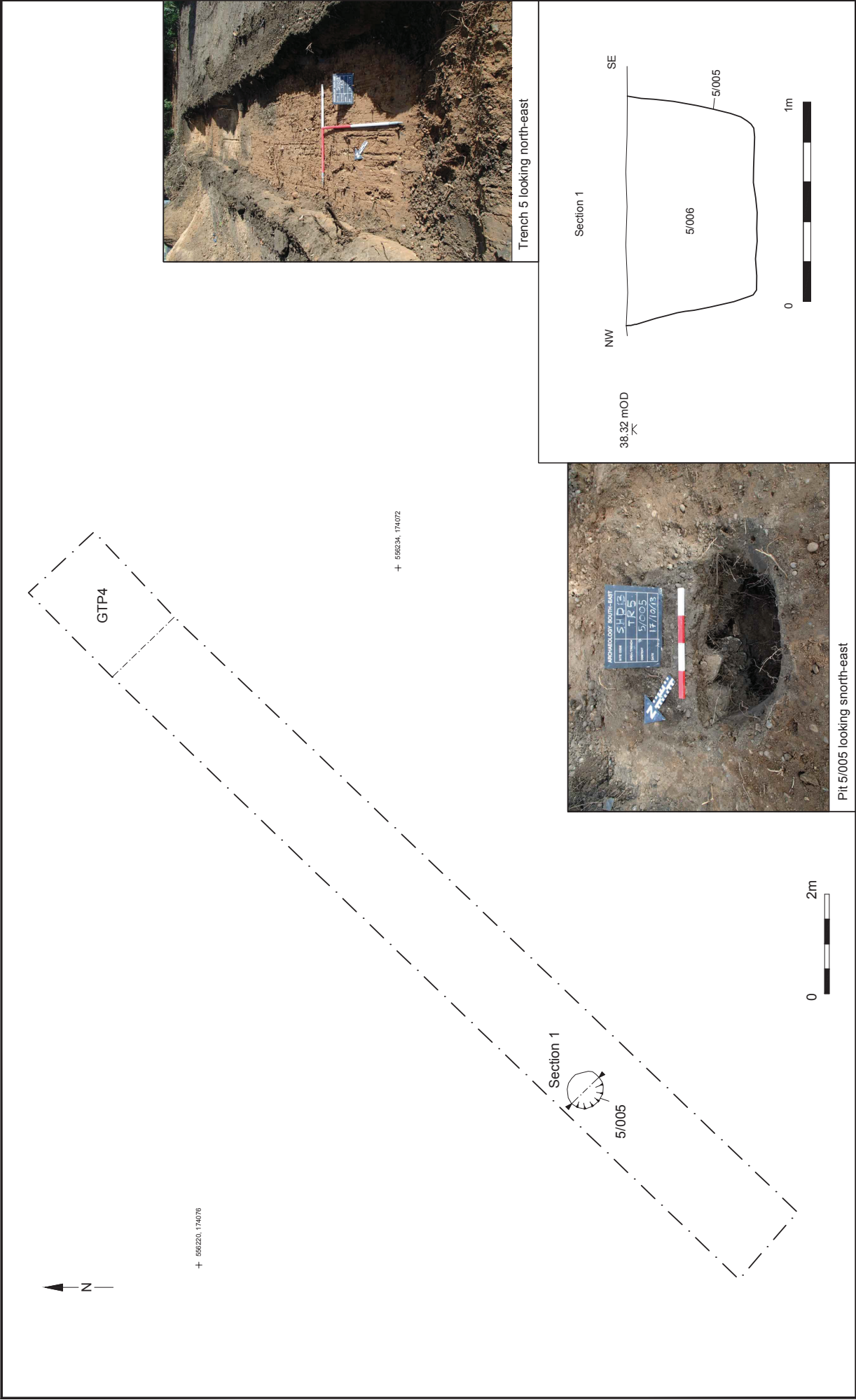
Site location

Fig. 1



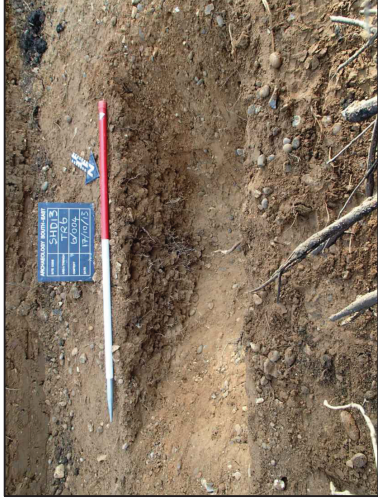
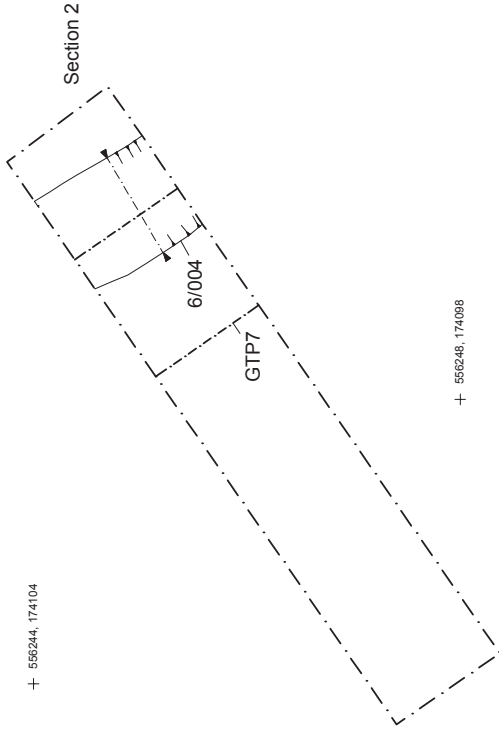
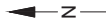
© Archaeology South-East		Stonehouse Hospital, London Road, Stone, Dartford	
Project Ref: 6179	October 2013	Trench Location	
Report Ref: 2013266	Drawn by: AR		

Fig. 2

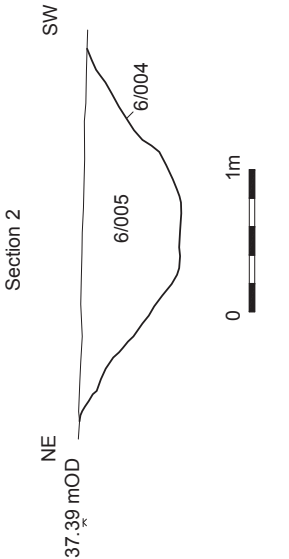


© Archaeology South-East		Stonehouse Hospital, London Road, Stone, Dartford	
Project Ref: 6179	October 2013	Trench 5 plan, section and photograph	
Report Ref: 2013266	Drawn by: AR		

Fig. 3



Pit 6/004, looking south-east



© Archaeology South-East

Project Ref: 6179	October 2013
Report Ref: 2013266	Drawn by: AR

Stonehouse Hospital, London Road, Stone, Dartford

Trench 6, plan, section and photograph

Fig. 4

Sussex Office

Units 1 & 2
2 Chapel Place
Portslade
East Sussex BN41 1DR
tel: +44(0)1273 426830
email: fau@ucl.ac.uk
web: www.archaeologyse.co.uk

Essex Office

The Old Magistrates Court
79 South Street
Braintree
Essex CM7 3QD
tel: +44(0)1376 331470
email: fau@ucl.ac.uk
web: www.archaeologyse.co.uk

London Office

Centre for Applied Archaeology
UCL Institute of Archaeology
31-34 Gordon Square
London WC1H 0PY
tel: +44(0)20 7679 4778
email: fau@ucl.ac.uk
web: www.ucl.ac.uk/caa

