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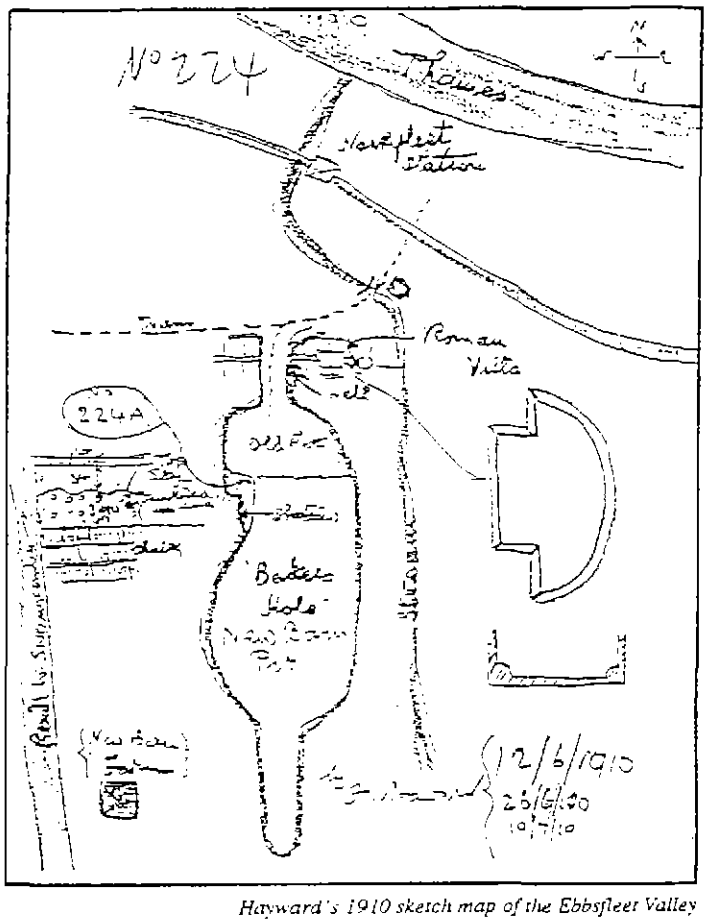
THE EBBSFLEET VALLEY, NORTHFLEET, KENT

ARC EFT 97

ARCHAEOLOGICAL EVALUATION

Contract No. 192/084-10507

Volume 1 Report



Hayward's 1910 sketch map of the Ebbsfleet Valley

OXFORD ARCHAEOLOGICAL UNIT
JULY 1997

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OS Grid TQ 6150 7400

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REPORT

Volume 1 of 3

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THE EBBSFLEET VALLEY, NORTHFLEET, KENT

ARCHAEOLOGICAL EVALUATION

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THE EBBSFLEET VALLEY, NORTHFLEET, KENT ARCHAEOLOGICAL EVALUATION

SUMMARY

As part of a larger programme of archaeological investigation along the route of the Channel Tunnel Rail Link, Union Railways Ltd. commissioned the Oxford Archaeological Unit to undertake a field evaluation of land in the Ebbsfleet Valley to the southwest of the North Kent railway line at Northfleet, Gravesend, Kent. The work took place in February to April 1997. The Ebbsfleet Valley is of national importance for Palaeolithic archaeology and Pleistocene geology and is the location of the Baker's Hole Levalloisian site. Quarrying during this century has significantly reduced this resource. This evaluation has established that a thin strip of sediments running along the side of a former quarry probably represent a remnant of the sediments associated with Baker's Hole site.

The Ebbsfleet Valley also contains the Neolithic Ebbsfleet ware type site. The evaluation has demonstrated that artefactual material of Neolithic date, in association with well-preserved organic remains, exists within the valley bottom. Artefactual material of Neolithic and Bronze Age date was also recovered from colluvial deposits along the margins of the valley bottom.

The wall-footings of a series of Roman buildings, the Northfleet Roman villa, were recorded in trenches left open following previous archaeological investigations. In addition, pits and ditches of Roman date were excavated in the vicinity of the buildings. Well-preserved environmental remains were retrieved from a number of these features and organic deposits of Roman date were also recorded. Saxon pottery recovered from colluvial deposits close to the villa indicates the possibility of a Saxon phase of occupation.

Evaluation of the archaeological remains was made more difficult by the presence of 20th-century dumped deposits. This was a particular problem in the valley bottom, where the depth of made ground varied from approximately 1 m to more than 2 m.

Section 11.10 below, accompanied by Figure 25, summarises the main archaeological zones within the Ebbsfleet area from data collected during the evaluation. It also refers to and illustrates the main areas of quarrying and made ground and comments, where appropriate, on the relationship between the CTRL related development and the zones of archaeological interest.

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SECTION 1: FACTUAL STATEMENT

1 BACKGROUND

1.1 Introduction

1.1.1 The Oxford Archaeological Unit undertook a two-stage archaeological evaluation (Fig. 1) between 17th and 20th February 1997, and between 17th March and 15th April 1997, on behalf of Union Railways Ltd (URL) on land within the Ebbsfleet Valley, south of Northfleet, near Gravesend, Kent (centred on TQ 6150 7400). The evaluation forms part of a programme of archaeological investigations along the line of the Channel Tunnel Rail Link (CTRL), the aim of which is to assess the impact of the construction of the new railway upon the cultural heritage.

1.1.2 Construction work in the Ebbsfleet Valley will include the CTRL itself; a connecting line to the existing North Kent line; the Ebbsfleet Intermediate Railway Station; and station access roads.

1.1.3 The work was carried out according to a Written Scheme of Investigation (WSI) prepared by URL which set out the scope and methods of the evaluation. The entire area of the evaluation is shown in Figure 2A and Figure 2B illustrates, at a scale of 1:2500, the main evaluation area to the immediate south of the sports area.

1.1.4 Previous archaeological discoveries in the Ebbsfleet valley range in date from the Palaeolithic to the Saxon period and are summarised in the Channel Tunnel Rail Link Assessment of Historic and Cultural Effects Specialist Report prepared by URL as part of the Environmental Assessment of the CTRL (URL 1994, Volume 4 Appendix B). The major findings are outlined below:

1.1.5 The area of the evaluation includes surviving Pleistocene deposits (Fig. 3), of which two areas form a Scheduled Ancient Monument for Palaeolithic remains (Kent No 267a and b). A number of investigations of these deposits have taken place this century: R A Smith carried out excavations at the nationally important site known as Baker's Hole in 1908-1909 (Smith, 1911); J P T Burchell worked in the area in the 1930s (eg Burchell, 1933); and Kerney and Sieveking in the 1960s and 1970s (Sieveking 1970, 1971, 1972, and Kerney and Sieveking,

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1977). More recently, F Wenban-Smith (1993) has carried out research into the Palaeolithic remains within the valley.

1.1.6 In the 1930s, Burchell excavated two sites (TQ 61747362 and TQ 61577307) immediately adjacent to the river Ebbsfleet on the valley floor, which produced both Mesolithic and Neolithic material in stratified deposits (Burchell 1938). One of these sites produced a particularly fine group of middle Neolithic decorated pottery, known as Ebbsfleet ware (Burchell and Piggott 1939). The site was re-excavated in 1960 by Sieveking, when horizontal waterlogged timbers were found immediately above a deposit containing Ebbsfleet ware (Sieveking 1960). Radiocarbon dating of the timbers produced a date of 3500-3050 cal BC. The two sites are a Scheduled Ancient Monument (Kent No 268).

1.1.7 The Northfleet Roman Villa was first excavated during 1909-1911 by W H Steadman (Steadman 1913) after Roman remains were exposed in the side of a tramway cutting. Two wells, a lime kiln, and the remains of a substantial building or buildings were located. A second building was discovered 20 yards to the south of the main buildings, partially destroyed by quarrying. Although unable to excavate much of the building, Steadman states that it had been 'thoroughly ransacked for building material' (Steadman 1913, 14). The site was re-excavated from 1977-1984 by a local archaeological society, the Thameside Archaeological Group (TAG), who excavated a bath house immediately to the north of the main building complex. Several short reports of their work have appeared in the Kent Archaeological Review between 1978 and 1984.

1.1.8 Further Roman remains as well as Saxon deposits were recorded in the face of the quarry pit now known as Blue Lake. Their exact location is unknown, but was recorded as being on 'the right side of the entrance into the main chalk quarry located to the north-east of the Northfleet sewage works' (Burchell & Brailsford 1948).

1.2 Geology, Landscape and Landuse

1.2.1 The Ebbsfleet is a small stream which rises at Springhead and flows north to join the Thames at Northfleet. The Thames channel is cut into chalk bedrock. Pleistocene deposits, known as the Boyn Hill gravels or more properly the Orsett Heath gravel unit, line its southern bank. The Ebbsfleet valley cuts transversely through these deposits and into the underlying chalk bed-rock, and is filled with a complex sequence of

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Pleistocene deposits which thus post-date the Orsett Heath gravel unit.

1.2.2 The Ebbsfleet Pleistocene deposits fall into two main categories: water-lain deposits (fluvial silts); and colluvial and solifluction deposits.

1.2.3 The fluvial silts reflect warmer periods when the Thames flowed at a higher level than it now does. This type of deposit is noted for its environmental evidence and the potential for *in situ* artefactual material.

1.2.4 Colluvial and solifluction deposits reflect colder periods when the banks were exposed and the surrounding land surface was de-stabilised so as to accumulate in the valley bottom. These deposits can contain disturbed environmental and artefactual material transported from their original positions, or can bury *in situ* material with little disturbance to them.

1.2.5 Several warm-cold cycles have occurred since the formation of the Ebbsfleet valley and this has resulted in a complex sequence of fluvial, solifluction and colluvial deposits. Reconstruction of this sequence is further complicated by the scale of quarrying which has occurred in the valley and which has destroyed the majority of the deposits.

1.2.6 The Holocene valley of the Ebbsfleet is filled with a complex sequence of alluvial, colluvial, fluvial and possibly estuarine deposits. Recent fieldwork carried out during geotechnical investigations for Kent County Council (Barham & Bates 1995) has shown that, in the northern part of the evaluation area (ie. downstream of the Northfleet villa site), the sequence is characterised by more than 7 m of fine-grained sediments overlying gravel. It is suggested that these deposits may fill a lake area or a tidally-influenced estuary. A period of lowered water levels, resulting in the formation of a land surface, is indicated by peat formation within the sequence. Upstream of the villa site, extensive peat formation indicates a wetland environment, marginal to the deeper water to the north. The peat deposits are, in places, overlain by silty clays suggesting a period of higher water levels.

1.2.7 Much of the valley has been quarried for chalk in recent years and many of the extraction areas have been landfilled with potentially contaminated material. Test pits 2005, 2006, 2018, and 2064 lie within an area of disused allotments, now partly returned to scrub. Trenches 1004-1008 lie within a clearing in dense scrub and on the edge of the Blue Circle sports ground. To

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the south and south-east of the sports ground, the Northfleet villa site lies within an area of scrub with limited clearings, and in an open area of mown grass. To the east of the Ebbsfleet, much of the area is made up of rough grass with marshy areas close to the stream. To the south, Trenches 1287-1310 lie in a narrow strip of thick scrub, with larger trees lining the edge of the reed beds adjacent to the river.

2 AIMS

2.1 The Written Scheme of Investigations outlined nine aims for the evaluation which are set out below:

2.1.1 To establish the presence/absence, extent, condition, character, quality and date of any archaeological remains within the area of the evaluation.

2.1.2 To determine the presence and potential of environmental and economic indicators preserved in any archaeological features or deposits.

2.1.3 To assess the local, regional, national and international importance of such remains, and the potential for further archaeological fieldwork to fulfil local, regional and national research objectives.

2.1.4 To assess the horizontal and vertical extent and sedimentological character of Palaeolithic deposits which may be affected by construction works.

2.1.5 To determine whether Upper Palaeolithic, Mesolithic, Neolithic, later prehistoric or historic archaeological deposits overlie Lower/Middle Palaeolithic deposits where these are examined.

2.1.6 To link archaeological material with interpretations of depositional processes for stratigraphic units.

2.1.7 To establish the presence/absence, character and condition of Mesolithic/Neolithic deposits where the rail link crosses the Ebbsfleet river and further north along the west side of the valley beneath the proposed station access roads and roundabouts and the relationship of such deposits to alluvial and/or colluvial deposits.

2.1.8 To examine the complex of Roman structures which may include a villa, an industrial complex, and wharfage on the bank of the Ebbsfleet: to determine as far as possible the extent, character and condition of deposits associated with the complex in the area

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surrounding the buildings which would be affected by the route and the intermediate station; to assess the degree of truncation suffered by such deposits in the post-Roman period; and to determine whether Palaeolithic deposits are present under the complex of Roman structures, and in the nearby area, and if so to assess their character and condition.

2.1.9 To assess the potential for Anglo-Saxon archaeology, particularly in the vicinity of the Roman site.

3 METHODS

3.1 General

3.1.1 A detailed methodolgy was agreed by Union Railways Limited with the County Archaeologist. The following is intended only to amplify certain aspects of the methodology.

3.1.2 The first stage of the evaluation consisted of an array of boreholes intended to determine the general character and extent of the Pleistocene deposits at the northern end of the site. This work was undertaken by the Geolarchaeological Service Facility (GSF) of University College London under the direction of Dr Martin Bates.

3.1.3 The second stage of the evaluation consisted of: excavation of a series of test pits to allow further examination of the Pleistocene/Palaeolithic deposits, and to allow the retrieval of artefacts and ecofacts; recording of two extant sections: one to the south of the Northfleet villa site, and a second close to the Scheduled Ancient Monument (Kent 267b); excavation of an array of test trenches and pits to investigate the Holocene development and post-glacial archaeology of the site; clearing and recording of archaeological trenches left open from previous excavation of the Northfleet villa site.

3.2 Survey

3.2.1 The trench and test pit locations were surveyed by P H Matts, Building and Civil Engineering Land Survey (Reading) based on a trench location plan provided by URL, and a data file of trench co-ordinates derived from that plan. A series of accurately located survey stations was surveyed where dense undergrowth and trees did not allow the setting out of individual trenches. Many of the trenches were subsequently re-located to avoid damage to underground services and overhead cables and to minimise damage to mature trees.

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3.2.2 Following excavation the trenches were re-surveyed by URL using a GPS system. Pegs marking the ends of each trench were left *in situ* to allow the survey data to be related to the drawn records made of each trench. In some instances, these pegs were destroyed or removed by vandals before survey could take place, and in these cases the ends of the back-filled trenches were located as accurately as possible.

3.2.3 The overall site plan (Fig. 2) and all other detailed trench plans show the URL local site grid which differs from the National Grid. Furthermore all trench plans are shown in their 'as excavated' locations rather than as their 'proposed positions', which in many instances differ owing to the difficulties of placing trenches as referred to in section 3.2.1 above.

3.2.4 The evaluation area (Fig. 2) falls within URL's Route Window No. 13.

3.3 Boreholes

3.3.1 A shell and auger percussion drill rig, capable of drilling and casing to depths of *c.*20m below ground surface through a variety of sediment types including sands and gravels, was used to drill an array of 6 boreholes in the northern part of the area and a single borehole adjacent to Trench 1240TT (Fig. 2, Plate 1). The drill rig was suitable for the recovery of undisturbed U4/U100 core samples, disturbed samples and bulk samples.

3.3.2 All boreholes were logged in accordance with geological descriptive standards commonly in use by the GSF staff. These also accord with, or extend, the standards used by the Museum of London Archaeological Service.

3.3.3 Where possible cores were extruded using an hydraulic core extruder. Where sample cores were overcompacted due to the nature of the sediment cores were removed by cutting through the core tubes longitudinally.

3.3.4 Extruded cores were split and individual halves retained in split plastic piping or the split U4/U100's. Both core halves were cleaned carefully using a knife or scalpel and the cleaned faces examined. One half of the core was selected for detailed study and photography.

3.3.5 Individual cores were subsequently described in detail using standard sedimentological terminology to describe colour, composition, bedding and grain sizes. In addition other features, such as the presence of clay coatings on clasts and sand grains,

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zones of reddening, blocky structure to the sediment and trace fossils indicative of plant rooting/bioturbation (possibly indicating pedogenic activity and/or the presence of a buried landsurface) were actively sought. Observations were recorded on individual sheets and are presented in full in Appendix 15.

3.4 Test Pits

3.4.1 The machine-dug test pits were excavated in spits, nominally of 0.25m depth, using a 360° excavator fitted with a toothless bucket. A proportion of spoil from each spit was stored separately to allow hand-sorting and sieving of the material for the recovery of artefacts. The topsoil was stored separately and an additional spoil heap was required for stratigraphically mixed material and for the excess material from each spit. Each spit was numbered separately.

3.4.2 The close proximity of potentially contaminated landfill sites, and the consequent risk from migrating landfill gases, dictated that access was not practicably possible below depths of 1.2m. However, it was not considered that this materially affected the observation and recording of the deposits encountered.

3.4.3 Sediments were recorded from the excavated material by M Bates of the GSF in accordance with the geological descriptive standards commonly in use by the GSF staff.

3.4.4 Approximately 100 litres of spoil from each spit was coarse sieved through a 10mm mesh. In addition, 100 litres of the spoil was hand-sorted (Plate 2). Dr F Wenban-Smith was present on site to supervise the recovery of the flint artefactual material and has produced a specialist assessment of the material recovered (Appendix 3).

3.4.5 Bulk samples for environmental analysis and recovery of small artefacts were taken from each significant stratigraphic unit. The samples were processed by mechanical flotation for the recovery of molluscs (Appendix 12), small mammal bones and small artefacts such as flint chips. The non-floating residue was sieved through 10mm, 4mm and 0.5mm meshes and sorted for artefacts and bone.

3.5 Extant Sections

3.5.1 The extant section (referred to as si-sii in the WSI) close to the Scheduled Ancient Monument was not recorded, with the agreement of URL and the County Archaeologist, as the section had already been recorded during recent work by Dr F Wenban-

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Smith. The results of this work have been incorporated in the present report and the section (Section 3) is illustrated in Figure 16. The section (referred to as section siii-siv in the WSI) close to the Northfleet villa site was considerably extended from the original specification agreed with URL, to enable an informed interpretation of the deposits to be made (Section 193, Figs. 16 and 18).

3.5.2 The deposits were recorded by M Bates of GSF in accordance with geological descriptive standards commonly in use by the GSF staff.

3.5.3 Bulk samples were taken for the recovery of small animal bones, mollusca, and small artefacts; column samples were taken from deposits to assess the potential for preservation of pollen, diatoms, and ostracods (monolith samples), as well as for micromorphological analysis (kubiena samples).

3.5.4 An additional section (Section 40, Fig. 16) has also been incorporated into this report which was not part of the original WSI. This section to the immediate north of Test-pits 2019 and 2020 was also previously recorded by Dr F Wenban-Smith and has been made available for the current study.

3.5.5 Copyright for Sections 3 and 40 rests with Dr F Wenban-Smith.

3.6 Test Trenches

3.6.1 It was proposed to excavate an array of 85 trenches, each 10m long, across the site. Poor ground conditions, the presence of services and the need to limit damage to mature trees meant that 17 of these trenches were not excavated and, of the remainder, many were relocated or shortened. This is summarised in Table 1.

3.6.2 Initially, the trenches were mechanically stripped of soil to the top of any archaeologically significant deposits or to a maximum depth of 1.2m. In practice, the majority of the trenches were excavated to 1.2m without encountering archaeological deposits. A number of trenches were subsequently deepened beyond 1.2m in order to establish the depth of made ground, the presence/absence of archaeological deposits and in order to record the sequence of deposits within the Holocene valley of the Ebbsfleet.

3.6.3 Where archaeological deposits were present, the trenches were hand-cleaned. Where recent re-deposited material was present, personal protective equipment was worn due to the risk of

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contamination, and hand-cleaning was kept to the minimum consistent with establishing that the deposits were modern.

3.6.4 Where trenches were subsequently deepened significantly below 1.2m, access to the trenches was not generally possible. In the case of Trench 1006TT, a proprietary shoring system was employed to allow access to a depth of 4 m, and the sides of Trench 1235 TT were stepped to allow access to a depth of 2.4 m.

3.7 The 'Villa' Trenches

3.7.1 Trenches left open by the Thameside Archaeological Group (TAG) were sufficiently cleared of undergrowth to allow the exposed walls of the Northfleet villa to be planned (Plate 3). In addition, five sections across the old trenches were hand-cleaned to allow detailed recording of deposits (Figs. 4 and 5).

3.7.2 After an initial walk-over of the area surrounding the open trenches, it became clear that the earlier excavations had been more extensive than previously recognised. An attempt was therefore made to determine their extent (Fig. 6), although this was hampered by the dense tree cover and undergrowth.

3.7.3 While Figure 6 indicates the precise location of several open trenches and the approximate location of many others, the difficulties of penetrating the dense tree cover means that other backfilled trenches or larger areas of disturbance undoubtedly exist.

3.8 Recording

3.8.1 Recording of test trenches followed the standard OAU single context recording system (Wilkinson ed. 1992). Where possible, those trenches deepened to examine the sequence of deposits within the Holocene valley were recorded by Dr M Bates following the standard recording system employed by the GSF. Context numbers were only assigned to these deposits where artefactual material was present or where soil samples were taken.

3.8.2 Context numbers are in italics throughout the text of this report. All evaluation records were prefaced by the site code ARC EFT 97.

4 RESULTS: GENERAL

4.1 Detailed stratigraphic logs are presented in Section 5 for each of the boreholes and test-pits recorded by the GSF.

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4.2 A thin strip of sediments running along the side of a former quarry and recorded in Section 193 probably represent a remnant of the sediments associated with Baker's Hole site.

4.3 *In situ* artefactual material of Neolithic date, in association with well-preserved organic remains, was recovered from Trench 1240TT, within the valley bottom. Artefactual material of Neolithic and Bronze Age date was also recovered from colluvial deposits along the margins of the valley bottom.

4.4 The remains of the Northfleet Roman 'villa' were found in trenches left open by the Thameside Archaeological Group (TAG) following excavations between 1977 and 1984. An interpretation of the exposed walls in relation to the results of the 1911 excavations is shown in Figure 6.

4.5 Archaeological deposits of Roman date were found in Trenches 1013, 1235, 1237, 1238 and 1287. Features of probable Roman date were also seen in 1236 and 1239.

4.6 The main components of each trench, where archaeological deposits were encountered, are described in Section 7. A summary of all the archaeological contexts and associated finds appears in the Archaeological Context Inventory (Section 9). Where excavation did not extend below the depth of made ground, these trenches have not been described in detail, but are summarised in Table 1

4.7 Assessment reports on the pottery, ceramic building material, struck flints, metalwork, wood, glass, stone objects, marine shell, animal bone and environmental remains are contained in Appendices 1-12.

4.8 The site archive has been compiled in accordance with the specification agreed with the County Archaeologist. It includes six electronic Datasets for the Fieldwork Event, Contexts, Bulk Finds, Special Finds, Environmental Samples and Graphical Output.

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Table 1: Summary of trenches

Trench No	Length (m)	Max depth (m)	Depth of modern overburden	Height (m OD) to base of overburden/top of arch. deposits*	Excavated below 1.2m	Comments (all depths are below ground level)
1004TT	8	1.4	>1.4	Below 2.07	No	Trench re-located to avoid dense undergrowth and mature trees. Trench shortened due to extreme compaction of upper dumped deposits.
1005TT	10	1.3	>1.3	Below 2.24	No	Trench in original location
1006TT	10	4	2.2	1.45	Yes	Trench re-located to avoid dense undergrowth and mature trees. E end of trench widened to allow insertion of trench shoring system to enable person access to a depth of 4m. Below 2.2m, *in situ* peat and clay layers were recorded. A column sample was taken through the sequence.
1007TT	10	1.2	0.9	2.11	No	Trench relocated to avoid reed beds adjacent to river. Upper part of sequence of clay silts, as seen in ARC1008TT, recorded below 0.9m.
1008TT	10	3.6	0.9	2.28	Yes	Trench relocated to avoid reed beds adjacent to river. Machine sondage excavated at NW end of trench revealed sequence of clay silts. Trench side collapsed at 3.6m.
1009TT	10.9	3.5	1.25	1.85	Yes	Trench re-located to avoid underground services. Machine excavated sondage at S end of trench showed sequence of clays and peats below 1.25m.
1010TT	10.7	1.45	1.35-1.4	2.02	Yes	Top of *in situ* sequence as seen in 1009TT recorded between 1.35 and 1.4m
1011TT	10.1	1.2	>1.2	Below 2.28	No	Made ground to below depth of trench
1012TT	10	1.2	>1.2	Below 2.07	No	Made ground to below depth of trench
1013TT	7	3.1	1.3	2.36	Yes	Trench shortened due to presence of overhead BT line. Machine excavated sondage at W end of trench showed sequence of silts and sands containing CBM and fragments of stone to 3.1m. Top of possible

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Trench No	Length (m)	Max depth (m)	Depth of modern overburden	Height (m OD) to base of overburden/top of arch. deposits*	Excavated below 1.2m	Comments (all depths are below ground level)
						upright timber observed at limit of sondage.
1014TT	9.5	1.6	see comments	Top of colluvial sequence at 2.93	Yes	Trench re-located to minimise damage to mature trees. Below modern topsoil, a series of homogeneous sandy silts was recorded containing frequent fragments of Roman tile, to a depth of 1.4-1.6m. It overlay a natural colluvial deposit.
1015TT	11.4	0.6	0.4-0.5	Top of colluvial sequence at 3.31	No	Trench re-located to avoid underground services and damage to mature trees. Modern dumping overlay former topsoil. Top of colluvial sequence at 0.55m. CBM, pot and flint flakes recovered from top of colluvial deposits
1016TT	10	3.3	0.25	Top of colluvial sequence at 3.75	Yes	Trench re-located to avoid underground services and damage to mature trees. Modern dumping overlay former topsoil. Top of colluvial sequence at 0.40m. Machine excavated sondage at SW end of trench revealed a colluvial sequence which continued below 3.3m. Pot , flint and CBM frags recovered from colluvium to a depth of 1.95m.
1017TT	11	1.2	>1.2	Below 5.21	No	Modern deposits associated with demolished electricity sub-station recorded to a depth of 1.2m.
1018TT	10	0.2	?	?	No	Concrete slab, associated with demolished electricity sub-station, encountered immediately below thin surface spread of rubble. Cable detected below slab so no attempt was made to remove it.
1019TT	11.10	1.0	0.35	Top of colluvial sequence at 4.84	No	Modern dumped material overlay former topsoil. Top of colluvial sequence at 0.6m. Pot and flint flakes recovered from upper colluvial deposit.
1020TT	7.8	1.2	0.5	Top of colluvial sequence at 4.71	No	Trench shortened due to presence of underground services. Modern dumped material overlay former topsoil. Top of colluvial sequence at 0.75m. Pot, flint flakes and CBM recovered from upper colluvial deposit

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Trench No	Length (m)	Max depth (m)	Depth of modern overburden	Height (m OD) to base of overburden/top of arch. deposits*	Excavated below 1.2m	Comments (all depths are below ground level)
1021TT	11	1.2	0.7	Top of colluvial sequence at 5.11	No	Modern dumped material overlay former topsoil. Top of colluvial sequence at 0.90m. Pot and flint flakes recovered from upper colluvial deposit
1022TT	6	1.2	>1.2	Below 5.11	No	Trench shortened due to presence of underground services.
1023TT	12.4	2.15	0.7	Top of colluvial sequence at 5.79	Yes	Modern dumped material overlay former topsoil. Top of colluvial sequence at 0.95m. Machine excavated sondage at NE end of trench revealed colluvial sequence similar to that seen in ARC 1016TT. Pottery, flint flakes and burnt flints were recovered from colluvial deposits.
1024TT	5	1.2	>1.2	Below 5.72	No	Trench shortened due to presence of underground services.
1025TT	10.7	2.0	>2.0	Below 5.20	Yes	Machine excavated sondage at W end of trench revealed at least 2.0m of modern dumped material but instability of sides made further excavation unsafe.
1026TT	10	1.2	>1.2	Below 5.71	No	Trench re-located to avoid underground services.
1027TT	-	-	-	-	-	Trench abandoned due to presence of high voltage cable c.0.3m below ground surface.
1229TT	-	-	-	-	-	Trench not excavated due to presence of several underground services.
1230TT	5	1.2	>1.2	Below 6.86	No	Trench shortened due to presence of underground services.
1231TT	7	0.6	0.4-0.6	7.16	No	Trench shortened due to presence of underground services. Modern dumped material overlay Coombe rock.
1232TT	7	4.75	0.4	7.56	Yes	Trench shortened due to presence of underground services. Modern dumped material overlay Coombe rock. Trench selected for deepening to investigate Pleistocene deposits.
1233TT	10	1.4	>1.4	Below 7.63	Yes	Made ground to below depth of trench
1234TT	10	1.2	0.2	Top of colluvial sequence at 5.68	No	Although only about 5m from surviving Roman foundations, no archaeological features were recorded in this trench.
1235TT	12	2.8	See	Top of	Yes	N end of trench was deepened and 'stepped' to

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Trench No	Length (m)	Max depth (m)	Depth of modern overburden	Height (m OD) to base of overburden/top of arch. deposits*	Excavated below 1.2m	Comments (all depths are below ground level)
			comments	archaeological deposits at 2.38		allow hand excavation below 1.2m. Below topsoil (up to 0.3m thick) were a series of homogeneous deposits containing frequent frags of Roman tile to a depth of 1.4m. The origin of these deposits is not clear but they may have been deposited during the Roman occupation of the site. Beneath them, a cut feature, 1.4m deep, was excavated. It contained much burnt material and may have been associated with the nearby Roman bathhouse.
1236TT	10	2.2	0.4	Top of archaeological deposits at 1.52	Yes	Machine excavated sondage at W end of trench revealed a sequence of ?alluvial deposits overlying a cut feature at a depth of 2.2m.
1237TT	12	2.2	see comments	Top of archaeological deposits at 2.06	Yes	A series of ?alluvial layers, 1.1-1.3m deep, containing Roman tile and occasional pottery, overlay a number of archaeological features. At the S end of the trench a dark grey deposit containing frequent burnt flints and charcoal frags filled a shallow hollow. It was cut to the N by a linear feature, 3.4m wide and 0.9m deep which contained pottery bone and tile. At the N end of the trench a roughly circular patch of burnt material (charcoal and burnt flints)was excavated.
1238TT	10.3	1.4	0.35	Top of archaeological deposits at 3.98	Yes	Three intercutting features at the S end of the trench were excavated and date to the Roman period.
1239TT	10	2.3	1.9	4.20	Yes	Trench re-located to west to minimise damage to mature trees. Machine excavated sondage at SW end of trench revealed *in situ* deposits of probable Roman date beneath a spoil heap possibly associated with quarrying earlier this century.
1240TT	10	5.0	2.5	1.73	Yes	Machine excavated sondage at NW end of trench revealed sequence

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Trench No	Length (m)	Max depth (m)	Depth of modern overburden	Height (m OD) to base of overburden/top of arch. deposits*	Excavated below 1.2m	Comments (all depths are below ground level)
						of organic silts. Struck flints recovered from deposit at depth of 3.6m.
1241TT	11	2.0	>2.0	Below 1.30	Yes	Machine excavated sondage abandoned due to instability of trench sides and inflow of water.
1242TT	8.3	1.2	>1.2	Below 2.38	No	Trench re-located to avoid inflow and outflow pipes for sewage works.
1243TT	10	1.2	>1.2	Below 2.68	No	Made ground to below depth of trench
1244TT	-	-	-	-	-	Trench not excavated due to presence of several underground services.
1245TT	10.15	1.2	>1.2	Below 3.05	No	Made ground to below depth of trench
1246TT	10	1.2	>1.2	Below 2.42	No	Made ground to below depth of trench
1247TT	10	1.2	>1.2	Below 2.22	No	Made ground to below depth of trench
1248TT	10	4.7	3.1	0.71	Yes	Machine excavated sondage at NW end of trench revealed interbedded peats and clay silts.
1249TT	-	-	-	-	-	Trench not excavated due to presence of high voltage cables, sewer inflow and mature tree.
1250TT	-	-	-	-	-	Trench not excavated as within reed beds adjacent to Ebbsfleet which are more extensive than previously mapped.
1251TT	10	1.5	>1.5	Below 1.22	No	Made ground to below depth of trench
1252TT	6	2.0	2.0	0.69	Yes	Trench shortened due to instability of trench sides. Machine excavated sondage at S end of trench revealed 2m of modern dumping overlying a peat deposit. Instability of trench sides and inflow of water prevented further investigation.
1253TT	-	-	-	-	-	Trench not excavated as within reed beds adjacent to Ebbsfleet which are more extensive than previously mapped.
1276TT	10.5	3	1.4-1.5	1.24	Yes	Trench re-located to foot of railway embankment. Machine excavated sondage at SE end of trench revealed *in situ* peat overlying clay beneath recent dumping.
1277TT	10	1.0	1.0	1.58	No	Trench re-located to avoid reed beds. Peaty layer encountered at 1.0m contained chalk frags so

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Trench No	Length (m)	Max depth (m)	Depth of modern overburden	Height (m OD) to base of overburden/top of arch. deposits*	Excavated below 1.2m	Comments (all depths are below ground level)
						may not be *in situ*. Trench sides very unstable.
1278TT	3.5	1.1	1.1	1.43	No	Trench shortened due to instability of trench sides. Peat deposits encountered at depth of 1.1m but instability of trench sides and inflow of water prevented further investigation.
1279TT	-	-	-	-	-	Trench not excavated as within reed beds adjacent to Ebbsfleet which are more extensive than previously mapped.
1280TT	10	1.2	>1.2	Below 1.90	No	Made ground to below depth of trench
1281TT	-	-	-	-	-	Trench not excavated as within reed beds adjacent to Ebbsfleet which are more extensive than previously mapped.
1282TT	-	-	-	-	-	Trench not excavated as within reed beds adjacent to Ebbsfleet which are more extensive than previously mapped.
1283TT	-	-	-	-	-	Trench not excavated due to presence of several high voltage cables.
1284TT	10	1.3	>1.3	Below 2.45	No	Trench re-located to ensure adequate clearance from Ebbsfleet.
1285TT	10	1.2	>1.2	Below 2.61	No	Made ground to below depth of trench
1286TT	10.5	1.4	>1.4	Below 2.09	No	Made ground to below depth of trench
1287TT	9.5	0.8	0.4-0.6	3.74-4.04	No	Modern dumping overlay a ?colluvial deposit dipping to the E. At the W end of the trench, this sealed a N-S linear feature, 2.2m wide and 0.9m deep, which contained a large fragment of Roman tile. At the E end of the trench the colluvial deposit sealed the terminal of an E-W linear feature, 1.0m wide and 0.3m deep, which contained several struck flint flakes.
1288TT	7	1.2	>1.2	Below 4.52	No	Trench shortened to minimise damage to undergrowth.
1289TT	9	1.2	>1.2	Below 5.21	No	Made ground to below depth of trench
1290TT	7.2	2.5	2.5	4.55	Yes	Trench preceded by 1x1x1m hand-dug test pit. Trench shortened due to presence of high voltage underground power lines. Machine excavated

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Trench No	Length (m)	Max depth (m)	Depth of modern overburden	Height (m OD) to base of overburden/top of arch. deposits*	Excavated below 1.2m	Comments (all depths are below ground level)
						sondage at W end of trench revealed undisturbed deposits beneath 2.5m of modern dumped material.
1291TT	10.8	1.3	>1.3	Below 5.78	Yes	Trench preceded by 1x1x1m hand-dug test pit.
1292TT	10	1.4	>1.4	Below 6.19	Yes	Trench preceded by 1x1x1m hand-dug test pit.
1293TT	1	1	>1	Below 6.88	No	1x1x1m hand-dug test pit excavated. Trench not excavated due to proximity of high voltage underground power cables and steep scarp down to reed beds.
1294TT	1	1	>1	Below 5.71	No	1x1x1m hand-dug test pit excavated. Trench not excavated due to proximity of high voltage underground power cables and steep scarp down to reed beds.
1295TT	11	1.2	>1.2	Below 5.88	No	Trench preceded by 1x1x1m hand-dug test pit.
1296TT	-	-	-	-	-	Trench not excavated due to proximity of high voltage underground power cables.
1297TT	-	-	-	-	-	Trench not excavated due to proximity of high voltage underground power cables.
1298TT	-	-	-	-	-	Trench not excavated due to proximity of high voltage underground power cables.
1299TT	-	-	-	-	-	Trench not excavated due to proximity of high voltage underground power cables.
1300TT	1	1	0.9 (lower 0.1m of test pit may also be recent dumped material but this is uncertain).	2.37	No	1x1x1m hand-dug test pit excavated. Trench not excavated due to proximity of high voltage underground power cables.
1301TT	10	1.2	>1.2	Below 4.49	No	Trench preceded by 1x1x1m hand-dug test pit. Potentially contaminated ground encountered in base of machine-excavated trench and trench immediately back-filled.
1302TT	-	-	-	-	-	Trench not excavated due to proximity of high voltage underground power cables.
1303TT	10	1.2	>1.2	Below 5.93	No	Made ground to below

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Trench No	Length (m)	Max depth (m)	Depth of modern overburden	Height (m OD) to base of overburden/top of arch. deposits*	Excavated below 1.2m	Comments (all depths are below ground level)
						depth of trench
1304TT	9.6	1.2	>1.2	Below 5.52	No	Made ground to below depth of trench
1305TT	6.5	1.4	>1.4	Below 4.86	Yes	Trench shortened due presence of high voltage overhead power lines.
1306TT	-	-	-	-	-	Trench not excavated due to presence of high voltage underground power cables and mature willow trees.
1307TT	-	-	-	-	-	Trench not excavated due to presence of high voltage underground power cables and mature willow trees.
1308TT	-	-	-	-	-	Trench not excavated due to presence of high voltage underground power cables and mature willow trees.
1309TT	10.5	1.35	0.55-0.90	4.60-4.79	Yes	Modern dumped material overlay former topsoil. Top of colluvial sequence at 1-1.2m. Flint flake and CBM recovered from colluvial deposit
1310TT	4	2.5	0.45	2.78-3.09	Yes	Trench shortened due to presence of mature willow trees. Deposits recorded from spoil as trench flooded very rapidly.
1311TT	10	1.2	>1.2	Below 1.31	No	Made ground to below depth of trench
2005TP	7	6.5	0.5	6.96	Yes	Re-located after excavation of 2064TP and 2018TP.
2006TP	4.6	5.9	0.3	8.30	Yes	Re-located after excavation of 2064TP and 2018TP.
2018TP	5.1	5.3	0.4	3.97	Yes	Layer containing common burnt flints and charcoal frags revealed at 2.7m dipping down to 3.0m to south-east. Much of sequence likely to be Holocene colluvium filling dry valley.
2019TP	6	4.15	0.50	9.13	Yes	Excavated through *in situ* Pleistocene deposits
2020TP	8	3.5	0.60	8.61	Yes	Excavated through *in situ* Pleistocene deposits
2021TP	1	1.2	?1.2	?2.84	No	Made ground to below depth of trench
2022TP	1	1.2	?1.2	?3.26	No	Pot and flint flakes recovered from lowest deposit
2063TP	5	5.1	0.7	7.04	Yes	Holocene deposits overlying Pleistocene deposits
2064TP	4	3	0.3	3.88	Yes	Test pit initially relocated after excavation of 2018 TP. Showed same

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Trench No	Length (m)	Max depth (m)	Depth of modern overburden	Height (m OD) to base of overburden/top of arch. deposits*	Excavated below 1.2m	Comments (all depths are below ground level)
						Holocene sequence observed in 2018TP - abandoned at 3.0m and relocated to 2006TP

* Note that where 'Below' used in this column the base of the modern overburden was not encountered. Consequently the OD level of any surviving archaeology must be below the stated OD height.

Table 1: Summary of trenches

5 BOREHOLE AND TEST-PIT DESCRIPTIONS

Old allotments

5.1 Borehole 0016SA (Fig. 7)

5.1.1 This borehole was drilled to a total depth of 10.0m below ground surface. Ground level at the top of the borehole was +6.31m O.D. A total depth of *c.* 4.50m of unconsolidated sediments was found overlying fractured Chalk bedrock.

5.1.2 Eight U4/U100 core samples were taken and seven bulk samples were recovered. This borehole is formed of four groups of sediments.

5.1.3 The Chalk bedrock lies at a depth of *c.* 4.50m from the top of the borehole. The contact between the Chalk and the overlying deposit is difficult to distinguish because of the chalk rich nature of the sediment which covers the chalk bedrock.

5.1.4 The deposit immediately above the Chalk bedrock is the first of the four groups of sediments present within the borehole. This first deposit is present between core depths of 4.50 and 3.50m. It is a poorly sorted chalk gravel unit, approximately 1m thick, containing sub-rounded chalk clasts up to >8.0cm diameter (at the base of the gravel). Flint gravel clasts are also present within the unit and these increase in frequency up through the unit. There is also an increase in the amount of matrix present within the unit.

5.1.5 Overlying this chalk gravel is a second gravel unit between core depths of approximately 3.50m and 2.70m. This gravel deposit is approximately 0.80m thick and formed by matrix supported

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chalk clasts up to a maximum of 2.5cm mean diameter in a matrix of silty sand with some bedding.

5.1.6 The third group of sediments present within the borehole is a series of sands and silty sands with flint gravel clasts. These deposits are present from approximately 2.70m to 0.67m core depth.

5.1.7 The fourth unit present within the borehole is composed of a series of silty sands between 0.67 and 0.20m. These deposits show an increase in the number and size of the gravel clasts compared to the sediments of the third group.

5.2 Borehole 0017SA (Fig. 8)

5.2.1 This borehole was drilled to a total depth of 10.0m below ground surface. Ground level at the top of the borehole was +7.47m O.D. A total depth of *c.* 4.50m of unconsolidated sediments were found overlying shattered Chalk bedrock, which lies at a depth of *c.* 4.50m from the top of the borehole. The contact between the Chalk and the overlying sediment is difficult to identify. The shattered nature of the chalk bedrock is very similar to the nature of the chalk rich low matrix gravels which overlay the bedrock.

5.2.2 Eight U4/U100 core samples were taken and six bulk samples recovered. The borehole contains four groups of sediments.

5.2.3 The first of the deposits present above the chalk bedrock lies between approximately 4.50 and 4.00 m core depth. This is a clast rich chalk gravel which is approximately 0.50 m thick and contains sub-angular to sub-rounded clasts up to 40 mm mean diameter. There is an increase in the matrix content of this deposit up through the sequence with the gravel changing from a clast supported to matrix supported gravel. This change represents a transition to the second group of sediments present within the borehole.

5.2.4 The second group of sediments is approximately 0.45 m thick and lies between approximately 4.00 and 3.55 m core depth. These deposits are composed of chalk rich, matrix supported, sub-angular to sub-rounded gravels in a silty matrix.

5.2.5 The third of the sediment groups present within the borehole contains a series of sands with occasional gravel clasts. These deposits are present between 3.55 and 1.10 m core depth. The sand deposits are approximately 2.45 m thick and dominated by well sorted fine sands with an increase in the silt component to

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the top of the sequence. They contain both chalk and flint clasts up to a maximum of 20 mm mean diameter.

5.2.6 At the top of the borehole between 1.10 and 0.30 m is a 0.80 m thick silty sand deposit with frequent chalk and flint gravel clasts. This deposit represents the fourth sedimentary group present within the borehole.

5.3 Borehole 0018SA (Fig. 9)

5.3.1 This borehole was drilled to a total depth of 10.0 m below ground surface. Ground level at the top of the borehole was +8.89 m O.D. A total depth of *c.* 4.62 m of unconsolidated sediments were found overlying Chalk bedrock which lies at a depth of *c.* 4.62 m from the top of the borehole. The contact between the Chalk bedrock and the overlying deposits is difficult to identify and thought to be present within U4/U100 sample 12.

5.3.2 Eight U4/U100 core samples were taken and four bulk samples recovered. This borehole contains three groups of sediments.

5.3.3 The first group of deposits above the chalk bedrock is a poorly sorted chalk gravel approximately 1.62 m thick and present between 4.62 and 3.00 m. There is an increase in the proportion of matrix to clasts up through the deposit and a change from a clast supported gravel to a matrix supported gravel.

5.3.4 The second group of sediments present within the borehole is approximately 2.05 m thick between 3.00 and 0.95 m, borehole depth. This group of sediments is represented by well sorted fine sands with occasional flint and chalk gravel clasts, which overlay the lower gravel unit.

5.3.5 The third of the groups of sediments in this borehole is approximately 0.65m thick and is present between 0.30 and 0.95 m, borehole depth. The transition from the well sorted sands of the second group of sediments is represented by an increase in the silt content to form a silty sand with flint and chalk gravel clasts.

5.4 Borehole 0019SA (Fig. 10)

5.4.1 This borehole was drilled to a total depth of 10.0 m below ground surface. Ground level at the top of the borehole was +5.92 m O.D. A total depth of *c.* 4.25 m of unconsolidated sediments were found overlying Chalk bedrock which lies at a depth of *c.* 4.25m from the top of the borehole.

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5.4.2 Seven U4/U100 core samples were taken and five bulk samples recovered. This borehole contains only two groups of sediments.

5.4.3 The first group of sediments overlying the chalk bedrock is 0.80 m thick and present between 4.30 and 3.50 m. This deposit is a poorly sorted chalk gravel with sub-angular to sub-rounded clasts up to 6cm mean diameter and clast supported.

5.4.4 The second group of deposits is a series of sandy gravels approximately 3.25 m thick. These deposits are present between 3.50 and 0.25 m and consist of poorly sorted, medium to fine sandy gravels with both flint and chalk clasts.

5.5 Borehole 0020SA (Fig. 11)

5.5.1 This borehole was drilled to a total depth of 10.0 m below ground surface. Ground level at the top of the borehole was +5.38 m O.D. A total depth of *c.* 6.00 m of unconsolidated sediments were found overlying Chalk bedrock which lies at a depth of *c.* 6.00 m from the top of the borehole.

5.5.2 Three U4/U100 core samples were taken and two bulk samples recovered. This borehole contains only two groups of sediments.

5.5.3 The first group is composed of predominantly of angular chalk clasts in a chalky putty-like matrix. Flint clasts are also present as well rounded to sub-angular clasts up to 30-50 mm mean diameter. This group of sediments is present between approximately 6.00 to 4.10 m, borehole depth, and is 1.90 m in thick.

5.5.4 The second group is dominantly composed of poorly sorted sands and sandy gravels between approximately 4.10 and 0.30 m borehole depth. These sandy gravel deposits are predominantly composed of flint clasts which are angular to sub-rounded and up to a maximum of 5.5cm mean diameter.

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5.6 Borehole 0021SA (Fig. 12)

5.6.1 This borehole (see Figure 2 for location) was drilled to a total depth of 10.0 m below ground surface. Ground level at the top of the borehole was +3.71 m OD. A total depth of *c.* 5.75 m of unconsolidated sediments were found overlying Chalk bedrock which lies at a depth of *c.* 5.75 m from the top of the borehole.

5.6.2 Nine U4/U100 core samples were taken and nine bulk samples recovered. The borehole can be divided into four groups of sediments.

5.6.3 The first of the deposits is composed of angular chalk fragments and is present between 5.75 and 5.62 m borehole depth.

5.6.4 The second group of deposits is present between approximately 5.62 and 2.88 m, borehole depth. These sediments form a series of sands and gravel deposits. The gravel deposits are dominated by angular to rounded flint clasts up to a maximum of 20 mm mean diameter. Shell and shell fragments are common throughout the second group of sediments. There is a general increase in the degree of sorting up through the group and a decrease in the number of flint clasts with clay/silt laminae present towards the top of the group.

5.6.5 The third group of deposits is present between approximately 2.88 and 2.15 m, borehole depth. These deposits are formed dominantly of silt but there is a small amount of sand present. Carbonate is present throughout the group as concretions often found infilling root canals. Whole mollusc shells and shell fragments are common throughout the group and the deposits are firm and compact.

5.6.6 The remaining part of the borehole is filled by the fourth group which is present between 2.15 and 0.30 m borehole depth. This group of deposits is formed form variably silty sands with gravel clasts up to a maximum of 25 mm mean diameter. The gravel fraction is dominated by flint, chalk is also present but forms the coarse sand and the fine gravel size fractions, root traces and thin clay/silt beds are also present.

Valley bottom

5.7 Borehole 0022SA (Fig. 13)

5.7.1 This borehole was drilled to a depth of 9.55 m below ground surface. Ground level at the top of the borehole was +4.22 m OD. A total depth of *c.* 8.90 m of unconsolidated sediment was recorded overlying Chalk bedrock.

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5.7.2 11 U4/U100 core samples, 10 cutting shoe samples and 1 bulk sample were recovered. Four main groups of sediment have been defined overlying the bedrock.

5.7.2 The Chalk bedrock lies at a depth of *c.* 8.90 m below ground level. The precice location of the Chalk bedrock surface was difficult to distinguish due to the chalk-rich nature of the sediments immediately overlying the Chalk bedrock and some fracturing of the bedrock surface caused by drill recovery of samples.

5.7.3 The deposit immediately overlying the bedrock between borehole depths of *c.* 8.90 and 8.50 m is a chalk-rich gravel.

5.7.4 Between *c.* 8.50 and 6.55 m is a body of sediment composed of variably coarse sand and flint gravels. This 2 m deep sediment unit exhibits a fining up trend in the upper 0.5 m.

5.7.5 The third unit above bedrock, between 6.55 and 4.00 m borehole depth is a silt sand, fining upwards to a sandy silt. The sediment matrix contains organic traces towards the top of the unit.

5.7.6 The upper unit is composed of organic rich silty sand and variably humified peat deposits. These deposits lie between *c.* 4.00 and 2.80 m below ground surface. There are pockets of clay sits and chalk pellets present within the predominantly organic silt matrix.

5.7.7 Made ground was recorded above 2.80 m borehole depth.

5.8 Test-pit 2005TP (Fig. 14)

5.8.1 This test pit was excavated on the valley side towards the northern end of the route corridor. The detailed stratigraphic log is given in Table 2. Sands and silts with common chalk and flint clasts are present between 0.50 m and 2.50 m depth (Spits1-8). Between 0.50m and 1.06 m depth these deposits are rich in silt. Some evidence for sub-parallel bedding is noted and carbonate concretions in old root canals were noted through much of the unit. These deposits overlie a thin flint gravel (2.50 - 2.80 m depth, Spit 9). Below 2.80 m depth (Spits 10-22) chalk gravel is present that shows an increase in large angular flints

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with depth. Tertiary flints[1] are present between depths of 2.8 m and 3.25 m.

Depth below surface (metres)	**Lithostratigraphy**		
Surface datum	7.455 m O.D.	**Total depth**	6.5 m
0.00 - 0.50	Topsoil		
	---graded contact---		
0.50 - 1.06 Spit 1 Spit 2	7.5YR 5/6 strong brown silty sand to sandy silt. Firm and compact with modern roots. Common angular chalk clasts (<1cm), angular. Occasional rounded Tertiary flint clasts (2-3cm). No apparent structure. Becomes coarser with depth, clay-silt content disappears and colour changes to 10YR 6/6 brownish yellow. Becomes denser.		
	---sharp/undulating contact---		
1.06 - 1.75 Spit 3 Spit 4 Spit 5	10YR 7/8 yellow loose medium to fine sand with common flint clasts. Clasts vary from well rounded Tertiary flints (1 to 2cm) to sub-angular to angular clasts (2-5cm). All clasts are rolled. Possibly sub-parallel bedding present. Carbonate concretions in old roots canals near top (dendritic mass of channels (1 to 2mm wide). Occasional modern roots present. Occasional chalk clasts also present.		
	---not observed---		
1.75 - 2.00 Spit 6	As above with 10YR 6/6 brownish yellow colour. Common Tertiary flints present. Carbonate concretions still present in old root channels.		
	---graded contact---		
2.00 - 2.50 Spit 7 Spit 8	As above but very dense network of carbonate concretions in root canals in places. Clasts appear to group into clusters.		
	---sharp contact---		
2.50 - 2.80 Spit 9	Very coarse poorly sorted flint gravel. Flint clasts are <1 to >20cm, angular to sub-angular and smaller Tertiary flints. Matrix of 10YR 6/6 brownish yellow sand. Dense and compact.		
	---not observed---		
2.80 - 3.25 Spit 10 Spit 11	10YR 8/3 very pale brown chalky gravel with sub-angular to sub-rounded clasts (1 to >4cm). Common flint clasts include Tertiary flints (<4cm) and sub-angular (5 to 25cm) flint clasts, rolled. Dense and compact. Matrix supported, matrix is chalky silt. Occasional patches of sand in matrix. Possibly bedded with some indications that chalk clasts lie parallel with interfaces. In places areas between larger clasts are filled with matrix containing chalk pellets. Very dense.		
	---not observed---		
3.25 - 3.60 Spit 12	As above but possibly slightly less dense and less consolidated. Thin lenses of 10YR 6/6 brownish yellow sand and interbedded within and around chalk clasts.		
	---not observed---		
3.60 - 4.25 Spit 13 Spit 14	As above but increasingly less dense. Many larger angular flint clasts (>10cm) are present.		
	---not observed---		
4.25 - 4.70 Spit 15 Spit 16	As above but increase in numbers of larger chalk blocks present. Very little matrix between blocks.		
	---not observed---		
4.70 - 5.00 Spit 17 Spit 18	As above with occasional black, unweathered angular flint clasts.		

[1] Tertiary flints are well-rounded black flints 10-20mm across usually with chatter marks. They are generally present in Upper Coombe rock and distinguish this from Lower Coombe rock.

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Depth below surface (metres)	Lithostratigraphy
	---not observed---
5.00 - 5.15 Spit 18	As above 10YR 8/6 staining on chalk blocks.
	---not observed---
5.15 - Spits 19-22	As above increase in size and numbers of large chalk blocks.
	---trench abandoned 6.5m---

Table 2: Lithostratigraphy recorded in Test-pit 2005 TP

5.8.2 The uppermost unit between 0.50 m and 1.06 m depth probably represents a colluvial slope wash deposit. Below this, sands, of probable fluvial origin occur that include a probable flint channel lag gravel at the base (2.50 m - 2.80 m depth). These deposits overlie potential chalk solifluction sediments that may grade into shattered chalk bedrock below c.4.0 m depth.

5.8.3 Flint artefacts of possible Neolithic date were recovered from Spit 1.

5.9 Test-pit 2006TP (Fig. 14)

5.9.1 This test pit was excavated on the valley side towards the northern end of the route corridor. The detailed stratigraphic log is given in Table 3. Sands and silts with common chalk and flint clasts are present between 0.30 m and 3.00 m depth (Spits 1-10). Between 0.30 m and 1.05 m depth these deposits are rich in silt. A sherd of pottery of probable Saxon date was recovered from Spit 2. Some evidence for carbonate concretions in old root canals were noted through much of the sequence. These deposits overlie chalk rich sediment with common chalk clasts that become larger and more angular with depth (3.00 m - 5.90 m, Spits 11 - 18). Below 4.70 m the chalk is clean, white and angular.

Depth below surface (metres)	Lithostratigraphy		
Surface datum	8.60 m O.D.	**Total depth**	5.9 m
0.00 - 0.30	Topsoil		
	---diffuse contact---		
0.30 - 0.60 Spit 1	10YR 4/6 dark yellowish brown very fine sandy silt with frequent poorly sorted flint clasts (<1-+5cm). Mixture of Tertiary and angular/sub-angular flints. Red CBM fragments. Modern roots - structureless and compact.		
	---diffuse contact---		

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Depth below surface (metres)	Lithostratigraphy
0.60 - 1.05 Spit 2 Spit 3	10YR 4/4 dark brown silty, fine sand. Decrease in frequency and numbers of flint clasts with depth. Roots still present. No structure, slightly looser.
	---diffuse contact---
1.05 - 1.25 Spit 3	10YR 4/6 dark yellowish brown stone-free silt to very fine sand. Structureless and firm.
	---abrupt contact---
1.25 - 1.75 Spit 4 Spit 5	10YR 5/8 yellowish brown very fine sand with some silt. Occasional flint and angular chalk clasts. Carbonate concretions present in root channels. Fines downwards to slightly finer sandy-silt. Common carbonate patches in root holes and occasional chalk clasts. Firm, dense and compact. ---not observed---
1.75 - 2.00 Spit 6	As above becoming coarser to a fine to medium sand with some silt. Friable and less compact than above. Occasional, more diffuse patches of carbonate material ---not observed---
2.00 - 2.25 Spit 7	10YR 7/8 yellow clay-silt with 7.5YR 5/6 strong brown mottles. Loose, unconsolidated. Very rare sub-angular rolled flint clasts (2-3cm) with rare carbonate patches. Clay-silt patches have blocky structure. ---not observed---
2.25 - 2.45 Spit 8	10YR 6/6 brownish yellow loose, unconsolidated sand with common well sorted flint clasts (<2cm), sub-angular to well rounded and rolled. Tertiary pebbles present. No apparent structure. ---not observed---
2.45 - 2.50 Spit 8	10YR 8/3 very pale brown carbonate rich sand. Porous structure with possible root holes. Thin bedded with occasional angular to sub-angular rolled flint clasts (<1cm). ---sharp/horizontal contact---
2.50 - 3.00 Spit 9 Spit 10	As above but with no clasts and carbonate patches absent. Soft and unconsolidated.
	---not observed---
3.00 - 3.25 Spit 11	10YR 7/4 very pale brown chalky-silt with common chalk clasts. Dense, compact and hard. Chalk clasts are well sorted (1 to 3cm) with smaller clasts between large clasts. Clasts moderately well rounded. Matrix of silt with occasional Tertiary pebbles and small angular flints (1 to 3cm). No apparent bedding). ---not observed---
3.25 - 3.40 Spit 12	As above - increase in matrix to clast ratio. Clasts become larger and there is an increase in flint abundance. Slightly less dense and compact. ---not observed---
3.40 - 4.70 Spit 12 Spit 13 Spit 14 Spit15	As above but very large blocks of flint appear with unweathered cortex. Blocks are >20cm. Colour is 10YR 8/1 white with very common fresh flint blocks with angular faces - not rolled. Common sub-rounded chalk clasts (1-5cm) and a matrix of silt with 1-2mm chalk pellets.
	---not observed---
4.70 - Spits 16-18	Large angular blocks of clean chalk. Occasional cortex covered flint block. Relatively soft and unconsolidated. ---trench abandoned 5.9m---

Table 3: Lithostratigraphy recorded in Test-pit 2006 TP

5.9.2 The uppermost unit between 0.30 m and 1.05 m depth probably represents a colluvial slope wash deposit. Below this, sands, of probable fluvial origin occur between depths of 1.05 m and 3.00 m. These deposits overlie potential chalk solifluction sediments that may grade into shattered chalk bedrock below c.4.0 m

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depth. Tertiary flint pebbles in the upper part of the solifluction deposit suggest that this deposit my correlate with the Upper Coombe Rock.

5.9.3 Flint artefacts of possible Neolithic date were recovered from Spits 2, 3 and 4. A sherd of pottery of possible Saxon date was recovered from Spit 2.

5.10 Test-pit 2018TP (Fig. 14)

5.10.1 This test pit was excavated at the northern end of the route corridor towards the foot of the western side of the valley. The detailed stratigraphic log is given in Table 4. A thick sequence of sandy silts overlying sands was recorded to a depth of 5.3 m depth. Carbonate rich horizons were seen in places (e.g. 1.50 to 1.75 m and 4.50 to 5.30 m) that appear to contain mollusc remains. All units appear to dip steeply downslope. Rooting was noted in some places (e.g. 2.60 to 2.80 m and 3.80 to 4.00 m) suggesting possible presence of stable surfaces during accumulation. The lower most sediment present in the trench was a chalky silt with angular flint and chalk clasts. Burnt flints and charcoal were common between 2.6 m and 2.8 m depth. Late Iron Age or early Roman pottery was recovered from Spits 4 and 5. Late Bronze Age pottery was recovered from Spit 11 (same as Context 15), which also contained very frequent burnt flints. A possible Late Bronze Age sherd was also recovered from Spit 12.

Depth below surface (metres)	**Lithostratigraphy**		
Surface datum	4.366 m O.D.	**Total depth**	5.3 m
0.00 - 0.40	10YR 3/3 dark brown silt. Loose and friable with modern roots. Occasional well rounded flint clasts 2 to 3cm. occasional angular flint clasts (<3cm). Occasional red CBM fragments. Structureless and unconsolidated. ---diffuse contact---		
0.40 - 1.20 Spit 1 Spit 2 Spit 3	10YR 4/6 dark yellowish brown sandy-silt, possibly becoming coarser with depth to a silty-sand. Occasional flint clasts (<1->10cm), sub-angular to rounded. Occasional modern roots. Firm and compact. ---graded contact---		
1.20 - 1.30 Spit 4	As above but possible increase in size and frequency of the larger flint clasts. ---sharp contact---		
1.30 - 1.50 Spit 5	10YR 4/4 dark yellowish brown silty-sand with common chalk clasts. Chalk clasts(<1 to +4cm) sub-angular to angular. Occasional angular flint clasts (2 to 5cm). All clasts are rolled. No apparent structure. Loose and friable. ---sharp contact---		
1.50 - 1.75 Spit 6	10YR 5/4 yellowish brown fine sand with some silt. Loose and friable - slightly damp. No apparent structure. Occasional flint clasts (<0.5 to >3cm), angular to well rounded. Common modern roots. Molluscs present, charcoal fragments common. Carbonate precipitate present as diffuse patches .		

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Depth below surface (metres)	Lithostratigraphy
	---graded contact---
1.75 - 2.00 Spit 7	As above but more compact. 10YR 5/2 greyish brown mottle with 7.5YR 4/6 strong brown colour. No molluscs present. Probable empty root canals noted. Occasional sub-angular to sub-rounded clasts of flint. Slightly blocky structure? ---sharp contact---
2.00 - 2.25 Spit 8	7.5YR 5/4 brown damp fine sand with some silt. Firm and compact. Common, poorly sorted flint clasts (<0.5 to >5cm), sub-rounded to sub-angular. Common sharp flints (possibly broken by machine). Less blocky structure than above, fewer roots canals than above. Mottled with 10YR 6/4 light yellowish brown . ---not observed---
2.25 - 2.60 Spit 9 Spit 10	As above possibly becoming coarser sand with depth. Network of small thin (<2mm) black stained root canals and larger (2 to 4mm) sand filled root canals. ---sharp contact---
2.60 - 2.80 Spit 11	10YR 4/3 brown mottle with 2.5Y 4/2 dark greyish brown sandy silt with medium sand. Firm and compact. Very common angular burnt flint fragments (<0.5 - >5cm). Charcoal present. Network of fine dendritic root canals (1-2mm) - black stained and empty. No apparent structure. Occasional red CBM fragments (<1cm) - very soft. ---sharp contact---
2.80 - 3.00 Spit 12	10YR 6/6 brownish yellow medium sand mottled with 10YR 5/8 yellowish brown along root canals. Firm and compact. Abundant evidence of vertical rooting. Occasional small angular flint chips (<0.5cm). Root still present in some root holes. Occasional fragments of burnt flint near top. Upper part of unit is 2.5Y 4/2 dark grey colour. ---not observed---
3.00 - 3.80 Spit 13 Spit 14 Spit 15	7.5YR 5/4 brown sand with some clay-silt showing 10YR 6/2 light brownish grey mottles. Blocky structure. Possibly fines down. Firm and compact. Dendritic root network and no apparent bedding. Very rare flint chips or pebbles (<1cm). ---sharp contact---
3.80 - 4.00 Spit 16	10YR 8/3 very pale brown carbonate rich silt with diffuse patches of 10YR 5/6 yellowish brown and 10YR 5/3 brown colour. Soft and malleable. Possibly exhibits some disrupted parallel bedding. Common carbonate traces as precipitate. Some possible evidence for rooting? ---not observed---
4.00 - 4.50 Spit 17 Spit 18	10YR 5/8 yellowish brown medium sand with patches of 10YR 5/4 and 10YR 8/3 very pale brown along remnant laminae. No flint clasts. ---not observed---
4.50 - 5.30 Spits 19-21	As above but with white flecks - molluscs? ---sharp contact---
5.30 -	10YR 8/3 very pale brown chalky silt. Dense and compact. Silt matrix supported. Clasts are poorly sorted (<0.5 to >5cm), sub-angular to sub-rounded and rolled. Occasional small (<0.5cm) angular flint chips. ---section collapsed 5.30m--

Table 4: Lithostatigraphy recorded in Test-pit 2018 TP

5.10.2 The coarse nature of the sands present in the trench suggest deposition by medium/high energy water within the fluvial context. However, the steeply dipping nature of the beds throughout the trench (parallel to the modern valley side) suggests that the sediments may have been deposited as a result of downslope colluvial movement reworking older, fluvial sediments known to exist higher on the slope. The lowermost

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unit, the chalky silt at the base of the trench, may represent a solifluction deposit. Significantly, if a colluvial origin for these sediments is correct, these deposits lie at similar datums to those interpreted to the north (ARC 0020 SA) and south (ARC 0021 SA) as Pleistocene sediments.

5.10.3 Flint artefacts were recovered from the upper 3 m of the deposits (Spits 1-13) and pottery of Late Bronze Age date was recovered from spits 6 and 12. Spit 11 (same as Context *1500*), which contained very frequent burnt flints, also yielded two fragments of possible quern or rubbers.

5.11 Test-pit 2064TP (Fig. 14)

5.11.1 This test pit was excavated in the northern part of the route corridor on the valley side. The detailed stratigraphic log is given in Table 5. The sediments present in the test pit consist of sands and silt with a variable carbonate content. Charcoal and burnt flints are common in parts of the sequence and traces of empty root canals testify to former landsurfaces.

Depth below surface (metres)	**Lithostratigraphy**		
Surface datum	4.177 m O.D.	**Total depth**	3.0m
0.00 - 0.30	Topsoil		
	---diffuse contact---		
0.30 - 1.00 Spit 1 Spit 2 Spit 3	10YR 5/8 yellowish brown silt with some possible fine sand. Common large flints, sub-angular to sub-rounded, rolled and large numbers of rounded Tertiary flints, some <1cm. Friable but compact. No apparent structure. Modern roots present.		
	---not observed---		
1.00 - 1.50 Spit 4 Spit 5	As above - becoming more dense and compact with a possible increase in clay content.		
	---not observed---		
1.50 - 1.75 Spit 6	As above - possibly coarser sand and increase in sand fraction. Charcoal flecks are common, burnt flint occasionally seen. Firm and compact. ---not observed---		
1.75 - 2.80 Spit 7	10YR 6/6 brownish yellow fine sand with some silt. Firm and compact. No apparent bedding. Very few sub-angular flints clasts (<1cm). Occasional modern roots, common empty sub-vertical root holes (2-4mm) across. Occasional clasts of burnt flint. ---not observed---		
2.80 -	10YR 8/3 very pale brown carbonate rich sand with some silt. Soft and pliable. Traces of empty root canals. Occasional carbonate patches. ---trench abandoned 3.0 m---		

Table 5: Lithostratigraphy recorded in Test-pit 2064 TP

5.11.2 These deposits are likely to represent colluvial sequences laid down on the valley side.

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5.12 Test-pit 2019TP (Fig. 15)

5.12.1 This sequence consists of two sequences of chalk rich sediments resting on an angular chalk deposit. The detailed stratigraphic log is given in Table 6. The upper chalk rich sediment lies between 0.50 m and 2.00 m depth (Spits 2-9) and contains Tertiary flint clasts and sand. The lower chalk rich unit lies between 2.00 m and 2.90 m depth (Spits 10-12) and lacks the Tertiary flints. Below 2.90 m depth large white chalk blocks are present that appear fresh, unweathered and angular.

Depth below surface (metres)	**Lithostratigraphy**		
Surface datum	9.63 m O.D.	**Total depth**	4.15 m
0.00 - 0.50 Spit 1	7.5YR 4/4 dark brown slightly sandy clay-silt. Dense and compact. No structure, blocky in places. At 0.3m a zone of large (4-6cm) flint clasts are present consisting of a mixture of Tertiary flints and sub-angular rolled flints.		
	---sharp/undulating contact---		
0.50 - 1.25 Spit 2 Spit 3 Spit 4 Spit 5	7.5YR 8/3 very pale brown silt with common chalk clasts and patches of 10YR 5/6 yellowish brown fine sand with Tertiary flint pebbles. Chalk clasts are poorly sorted (<1 to +5cm), sub-angular and rolled. Occasional sub-angular flint clasts. evidence of injection features and mixing.		
	---not observed---		
1.25 - 1.70 Spit 5 Spit 6 Spit 7	Patches of 10YR 6/8 brownish yellow sand with Tertiary flints (common), sub-angular flints (2 to 5cm) are rarer and occasional chalk clasts (c. 5cm). Poorly sorted. Also associated with very large flint blocks 30-50cm. Chalky matrix.		
	---not observed---		
1.70 - 2.00 Spit 8 Spit 9	As above but very dense concentrations of Tertiary flint clasts in places.		
	---not observed---		
2.00 - 2.90 Spit 10 Spit 11 Spit 12	10YR 7/4 very pale brown chalk gravel. Crude bedded with beds of coarser, larger chalk rubble with clasts 5-10cm and finer chalky beds with silt matrix.		
	---not observed---		
2.90 - Spit 13 Spit 14 Spit 15	2.5Y N2 white chalk blocks - large, angular and fresh. Occasional white cortex on angular flint clasts. Chalk putty matrix.		
	---trench abandoned 4.15m---		

Table 6: Lithostratigraphy recorded in Test-pit 2019 TP

5.12.2 Both of the main chalk rich units are interpreted to represent solifluction deposits laid down under cold climatic conditions. The presence of Tertiary flint clasts in the uppermost unit (0.50 m to 2.00 m depth) suggests that this may correlate with the Upper Coombe Rock unit. The lower unit, missing the Tertiary

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flint clasts (2.00 m to 2.90 m depth) may correlate with the Lower Coombe Rock. Below 2.90 m the sediments probably represent *in situ* shattered chalk bedrock.

5.12.3 A shattered and incomplete Mousterian flint core was recovered from Spit 3.

5.13 Test-pit 2020TP (Fig. 15)

5.13.1 This sequence consists of two sequences of chalk rich sediments resting on an angular chalk deposit. The detailed stratigraphic log is given in Table 7. The upper chalk rich sediment lies between 0.60 m and 1.90 m depth (Spits 1-6) and contains Tertiary flint clasts and sand. The lower chalk rich unit lies between 1.90 m and 2.70 m depth (Spits 7-8) but lacks the Tertiary flints. Below 2.70 m depth large white chalk blocks are present that appear fresh, unweathered and angular. At the top of the sequence a clay-silt unit is noted (0.00 m to 0.60 m).

Depth below surface (metres)	**Lithostratigraphy**		
Surface datum	9.21 m O.D.	**Total depth**	3.5 m
0.00 - 0.60	7.5YR 4/6 strong brown clay-silt. Predominantly clast free (occasional angular flint clasts, c. 5cm). Structureless, firm and compact. ---abrupt/undulating contact---		
0.60 - 1.90 Spit 1 Spit 2 Spit 3 Spit 4 Spit 5 Spit 6	10YR 7/4 very pale brown chalk gravel. Matrix supported with silt matrix. Clasts are predominantly of chalk <1 to +5cm, sub-angular and slightly rolled. Dense, common flint clasts in places, diffuse patches of Tertiary flints in a 10YR 6/6 brownish yellow silt/fine-sand matrix with no clear evidence for bedding. Zones of 10YR 6/6 brownish yellow silt as 'rafts or discontinuous beds'. In places involutions seen injected upwards through profiles. ---diffuse/undulating contact---		
1.90 - 2.30 Spit 7	10YR 7/4 very pale brown chalk gravel without flint and Tertiary pebbles. Crudely bedded with beds of coarser, larger chalk rubble with clasts 5 to 10cm and finer chalk beds with clasts <5cm and silt matrix. ---not observed---		
2.30 - 2.70 Spit 8	7.5YR 7/8 reddish yellow staining to chalk clasts as above. Clasts become larger to 15 to 20cm ---graded contact---		
2.70 - Spit 9 Spit 10	2.5Y N8 white chalk with fine silt putty matrix. Angular clasts >20cm. ---trench abandoned 3.5 m---		

Table 7: Lithostratigraphy recorded in Test-pit 2020 TP

5.13.2 Both of the main chalk rich units are interpreted to represent solifluction deposits laid down under cold climatic conditions. The presence of Tertiary flint clasts in the uppermost unit (0.60 m to 1.90 m depth) suggests that this may correlate with the Upper Coombe Rock unit. The lower unit, lacking the Tertiary

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flint clasts (1.90 m to 2.70 m depth) may correlate with the Lower Coombe Rock. Below 2.70 m the sediments probably represent *in situ* shattered chalk bedrock. The uppermost sediment between the ground surface and a depth of 0.60 m may represent a thin accumulation of colluvial slope wash sediments.

5.13.3 A rolled flint flake was recovered from this test-pit, but its context was not determined.

5.14 Test-pit 2063TP (Fig. 15)

5.14.1 This trench was excavated on the spur of ground on which the Roman villa is sited and lay immediately to the north of Section 193. The detailed stratigraphic log is given in Table 8. The sediments consisted of a thin sequence of silts/clay-silts between 0.70 m and 1.40 m depth overlying sands and silts to a depth of 4.40 m. These sands contained molluscs at the top of the unit. Carbonate concretions throughout the sequence suggest the presence of former roots and possible weathering horizons. Below 4.40 m depth (Spits 1-3) a carbonate rich silt containing flint and chalk clasts was seen. Clean brecciated chalk was noted below this unit at a depth of 5.00 m.

Depth below surface (metres)	**Lithostratigraphy**
Surface datum	6.74 m O.D. **Total depth** 5.10 m
0.00 - 0.70	Fill/made ground ---sharp contact---
0.70 - 0.80	10YR 3/4 dark yellowish-brown to 10YR 2/1 black silt with common charcoal fragments and angular flint clasts (2-4cm). Structureless and compact. ---sharp contact---
0.80 - 0.90	10YR 3/4 dark yellowish-brown to 10YR 6/6 brownish-yellow silt. Dense and compact. Occasional large, angular to sub-angular flint clasts (<0.5 to +5cm). ---diffuse contact---
0.90 - 1.40	10YR 4/4 dark yellowish-brown, grading downwards into 7.5YR 5/6 strong brown, dense clay-silt. Very rare sub-angular flint clasts, (<0.5 to +3cm). Blocky structure, massive and with modern roots. ---abrupt/undulating contact---
1.40 - 1.84	10YR 7/3 very pale brown silt to very fine sand. Molluscs present. Diffuse finger-like intrusions downwards of 10YR 6/6 yellowish-brown silt. Very rare sub-angular flint clasts towards base (2-3cm). Relatively soft and friable. Carbonate rich? Possibly becomes slightly coarser with depth. ---diffuse contact---
1.84 - 1.90	7.5YR 6/4 light brown carbonate rich silt. Patches of dense concretions of carbonate filled root tubules. ---sharp contact---
1.90 - 4.40	10YR 5/8 yellowish-brown very fine sand with some silt. Carbonate concretions fill root tubules as above. Soft, structureless and massive. Occasional modern roots. ---sharp contact---

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Depth below surface (metres)	Lithostratigraphy
4.40 - 5.00 Spit 1 Spit 2 Spit 3	10YR 8/4 very pale brown chalky-silt with matrix supported flint and chalk clasts. Very dense and hard. Common Tertiary pebbles and larger flint clasts (>10cm) and sub-angular chalk clasts. Becomes softer and non-cemented with depth. Larger flint clasts appear with depth. ---abrupt contact---
5.00 -	10YR 8/1 white brecciated chalk with angular chalk clasts (sharp and fresh). Clasts are cemented together. No matrix, voids between chalk clasts are filled with smaller chalk clasts. Occasional very large flint blocks with primary cortex remaining. ---trench abandoned 5.10m---

Table 8: Lithostratigraphy recorded in Test-pit 2063 TP

5.14.2 As previously noted, sequences such as that recorded here are difficult to interpret. The grain size distributions indicate deposition by a probable fluvial source however, reworking of pre-existing sequences downslope is likely to account for the sediments between 0.70 m and 4.40 m depth. The position of the sequence on the valley side substantiates such a hypothesis. The underlying chalky silts (4.40 m to 5.00 m depth) are probably solifluction sediments laid down under periglacial conditions.

5.15 Test trench 1232 TT (Fig. 15)

5.15.1 This test pit was excavated on the spur of ground on which the Roman villa is sited due west of the southern end of Section 193. The detailed stratigraphic log is given in Table 9. The sequence consists of sands and silts between 0.50 m and 1.25 m depth (Spits 1 - 2) overlying two chalky rich units. The upper chalk rich deposit (1.25 - 1.90 m, Spits 3-5) contains abundant Tertiary flints and some sand patches. The lower chalk unit (1.90 - 3.75 m, Spits 6-12) consists of chalk blocks and large flint clasts. These deposits overlie clean, blocky chalk (Spits 13-16).

Depth below surface (metres)	Lithostratigraphy		
Surface datum	7.78 m O.D.	**Total depth**	4.75 m
0.00 - 0.50	Made ground/fill ---abrupt contact---		
0.50 - 0.72	10YR 4/6 dark yellowish-brown slightly sandy clay-silt. Firm and compact. No apparent structure. Common well rounded Tertiary flints. Common angular flint clasts (5-7cm). Modern roots. ---abrupt contact---		
0.72 - 0.82 Spit 1	As above with very common, large, angular flint clasts (+10cm). ---abrupt contact---		

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Depth below surface (metres)	Lithostratigraphy
0.82 - 0.96 Spit 1	As above but large angular flints are replaced by very common Tertiary flints. Compact and dense. ---diffuse contact---
0.96 - 1.10 Spit 1 Spit 2	10YR 5/8 yellowish-brown to 10YR 6/6 brownish-yellow silty, medium sand. Firm and possibly bedded. Common Tertiary flints and occasional angular flint clasts. ---sharp contact---
1.10 - 1.25 Spit 2	10YR 4/4 dark yellowish-brown dense clay-silt. Firm and compact. Occasional very small sub-angular flint clasts (2 to 6mm). ---sharp contact---
1.25 - 1.50 Spit 3	10YR 7/4 very pale brown chalky silt with very common chalk clasts. Clasts are sub-angular to sub-rounded (0.5 to +4cm). Common Tertiary flints. Flints appear to increase in frequency with depth . No apparent bedding . Firm and compact. ---not observed---
1.50 - 1.90 Spit 4 Spit 5	As above - flints appear to be very large blocks of angular to sub-angular flint. Occasional patches of 10YR 6/6 brownish-yellow sand with some silt. Sand is present as a strip across trench and contains common Tertiary pebbles and other well rounded flint clasts. Common Tertiary shell fragments are also noted. ---sharp contact---
1.90 - 3.00 Spit 6 Spit 7 Spit 8 Spit 9	10YR 7/4 very pale brown chalk-gravel with silt matrix. Matrix supported. Chalk clasts are 2 to 5cm. Only very rare flint clasts - 2-10cm, angular. Matrix contains putty chalk and chalk grit. Chalk blocks increase in size with depth to c. 25cm. Soft and friable. ---not observed---
3.00 - 3.30 Spit 10	As above - occasional large flint blocks (>20cm) with unweathered white cortex. ---not observed---
3.30 - 3.50 Spit 11	As above but flint cobbles absent. ---not observed---
3.50 - 3.75 Spit 12	As above but very large flint clasts present (40 to 50cm). ---not observed---
3.75 - Spits 13-16	2.5Y N8 white chalk with angular chalk blocks (0.5 to +10cm). Chalk putty matrix between clasts. ---trench abandoned 4.75m---

Table 9: Lithostratigraphy recorded in Trench 1232 TT

5.15.2 The nature of the sediments indicates that the two chalk units probably represent chalk coombe rock deposited under cold periglacial conditions. The presence of Tertiary flints in the upper chalk deposit indicates that this unit may be correlated (on lithological criteria) with the Upper Coombe Rock (1.25 m - 1.90 m, Spits 3-5). The underlying chalk solifluction deposit (1.90 m - 3.75 m, Spits 6-12) can be correlated with the Lower Coombe Rock. The uppermost sediments, consisting of sand and silts, may represent fluvially derived sediments or perhaps colluvially reworked fluvial deposits.

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6 MAJOR SECTION DESCRIPTIONS

6.1 Section 3 (Fig. 16)

6.1.1 This section was previously recorded by F. Wenban-Smith (see 3.5.1 above). The section number refers to F. Wenban Smith's section numbering sequence rather than the OAU sequence used during the present evaluation.

6.1.2 This section runs parallel to the edge of the former valley side (Fig. 2). The section showed a shallow sequence of top-soil and clay-silt sediments overlying cemented chalk rubble grading down into chalk bedrock. At the south-eastern end of the section interbedded sands, gravels and chalk rubble deposits lay within a cut into the chalk bedrock. The deposits were interdigitated with the cemented chalk rubble at the edge of the cutting, and cemented chalk rubble also lines the base of the cut. The full depth of the cut was not observed but observations in a nearby cutting suggest that its base lies around 6 m OD.

6.1.3 The cemented chalk rubble includes angular chalk clasts probably representing chalk bedrock degraded under the influence of periodic cold episodes. It is not thought that this deposit has moved after shattering. The overlying clay-silt and top-soil are a mixture of colluvially transported and aeolian deposited sediments. The cut and fill deposits are horizontally bedded with well-sorted horizons of silt, sand and gravel. There are also distinct horizons of transported and derived Tertiary shell material. These sedimentary facies strongly suggest a fluviatile origin for the origin of these deposits. Faunal remains from the channel deposits include watervole and pike, supporting the interpretation of a fluviatile depositional mode.

6.2 Section 40 (Fig. 16)

6.2.1 This section was previously recorded by F. Wenban-Smith (see 3.5.4 above). The section number refers to F. Wenban-Smith's section numbering sequence rather than the OAU sequence used during the present evaluation.

6.2.2 This section forms part of the former pit edge and runs west south west to east north east long the ridge of sediments on which the Roman villa was constructed (Fig.2). The upper part of the profile and the western end of the section are dominated by sands and silts. These are bedded in places and sealed all other deposits. The underlying sediments consisted at the top of a mixture of flint gravel (derived Tertiary pebbles) and sub-angular chalk clasts cemented in a fine calcareous silty matrix,

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dirty cream coloured due to loamy contaminants. Below the upper units there was a sediment consisting of a mixture of sub-angular chalk rubble and frost-shattered flint nodules, with very occasional Tertiary pebbles and cemented in a fine calcareous silt matrix. The boundary between these two units was marked by a series of pockets of loam and gravel filling involutions developed on the surface of the lower deposits . Sub-horizontal seams of fine green silt are also developed in the top part of the lower chalky sediments and at the boundary between the two units.

6.2.3 Both the chalk rich deposits are solifluction deposits, representing the degradation and downslope movement of material under periglacial conditions. Their lithological content suggests that the upper unit (containing Tertiary flints) may correlate with the Upper Coombe Rock and the lower unit with the Lower Coombe Rock. The boundary between the Upper and Lower Coombe Rocks is marked by a horizon of loam/gravel filled involutions indicates deposition on two separate occasions, although it is impossible to estimate the duration of time between these depositional episodes. The loam/gravel may represent the transported and contorted remnants of a landsurface developed in the Ebbsfleet Valley between the deposition of the Upper and Lower Coombe Rocks. The seams of silt within the Coombe Rock may represent transient fluvial events. The uppermost sands and silts are a mixed aeolian/colluvial deposit.

6.3 Section 185 (Fig. 17)

6.3.1 This section was cut south south west of section 193. The section lies to the south east of the spur of high ground trending to the north west on which the Roman villa was constructed (Fig. 2). The lower part of the sequence (unit I) consists of chalk rubble with occasional sub-angular to angular flint clasts. This is overlain by chalky sediments containing Tertiary flints (II - V). The uppermost part of the sequence is dominated by sands and gravels of units VI - XI.

6.3.2 The chalky deposits represented by the sediments of units I - V represent coombe rock sediments deposited by solifluction processes under cold climatic conditions. These can be ascribed to the Upper (II - V) and Lower (I) Coombe Rocks. The overlying sediments consisting of sands and gravels (VI - XI) may be of fluvial origin or represent reworked sediments originally resting at higher elevations on the slope.

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6.4 Section 193 (Figs 16 and 18)

6.4.1 This section (section siii-siv in the WSI) was cleaned along the line of the old pit face (Plate 4). The section lies to the south east of the spur of high ground trending to the north west on which the Roman villa was constructed (Fig. 2).

6.4.2 The southern part of the section produced a sequence similar to that in the Section 185 consisting of three distinct stratigraphic units, i) sands and gravels immediately below the topsoil, ii) chalk gravel with Tertiary flints and iii) chalk gravel without Tertiary flints. These deposits sat ontop of shattered chalk blocks with flint clasts.

6.4.3 Towards the central part of the section a major sand unit was noted to be interbedded with the uppermost chalk gravel unit which appeared to both overlie and underlie the sand. From south to north the lower chalk gravel dipped down from a datum of 7 m O.D. at the southern end to *c.* 2 m O.D. at the northern end. At the northern end a complex association of interbedded sands and gravels, including an associated possible palaeosol horizon, were mixed and interbedded with chalk gravels that are either a part of the uppermost chalk gravel or were derived from this deposit.

6.4.4 Within the northern part of the section molluscan remains were visible in the contexts associated with the possible palaeosol and in some of the interbedded sand/gravel units above the palaeosol.

6.4.5 The chalky deposits represented by the sediments at the southern end of the section represent coombe rock sediments deposited by solifluction processes under cold climatic conditions. These can be ascribed to the Upper (containing Tertiary flints) and Lower (lacking Tertiary flints) Coombe Rocks. The overlying sediments consisting of sands and gravels may be of fluvial origin or represent reworked sediments originally resting at higher elevations on the slope.

6.4.6 The sediments at the northern end of the sequence appear to represent fluvially deposited sequences alternating between periods of higher and lower flow rates (sands and gravels). The presence of a reddened horizon suggests that this point may represent a phase of stability, weathering and soil formation. If correct this may represent a palaeolandsurface. Molluscan material from contexts 1960 and 1970 confirm the fluvial interpretation (*Lymnaea* sp., *Planorbis* sp., *Pisidium* sp.).

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6.4.7 The sediments of the central part of the section are difficult to interpret. It is difficult to relate the sediment bodies across this zone of transition. Elements of sediments similar in composition to the Upper Coombe Rock clearly extend into the northern end of the section and appear to lie above and below the fluvial sands containing molluscs. However, it is unclear whether or not these deposits have been reworked and it is possible that elements of the Upper Coombe Rock may have moved during successive cold phases. The interbedded chalk gravels and sands immediately to the south of the pipe trench indicate deposition perhaps within a cold phase at the slope base impacted on by fluvial systems.

6.4.8 On the basis of the evidence here it is suggested that the fluvial sediments preserved at the northern end of the section probably post-date the primary deposition of the Lower and Upper Coombe Rock deposits. However remobilization of the Upper Coombe Rock appears to have occurred following deposition of the sands. The presence of the palaeosol within the sand sequence may indicate ameliorated conditions of interstadial or interglacial character. The deposition of the reworked Coombe Rock above this level suggests a return to cold climate conditions following deposition of the sand sequence.

7 TRENCH DESCRIPTIONS

7.1 Trenches 1004-1008TT

Trenches 1004 and 1005

7.1.1 In Trenches 1004 and 1005 modern dumped deposits extended to more than 1.4 m and 1.3 m respectively below the ground surface.

Trench 1006 (Fig. 19)

7.1.2 The use of a proprietary shoring system allowed access to a depth of 4 m. Recent dumped material was about 2.2 m thick and, at 1.45 m OD, the top of the undisturbed Holocene sequence was encountered. The sedimenatary sequence was recorded by M Bates and is presented in Table 10. A column sample 1.8 m long was recovered from the sequence.

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Depth below surface (metres)	Lithostratigraphy
Surface datum	3.65 m OD **Total depth** 2.6 m
0.00 - 2.20	made ground ---sharp/undulating contact---
2.20 - 2.25	10YR 4/1 dark grey silty sand with angular to sub-rounded chalk clasts (poorly sorted). Occasional angular flint clasts (<30mm). ---sharp contact---
2.25 - 2.45	7.5YR 4/2 dark brown rapidly oxidizing to 10YR 2/1 black fibrous peat with stem fragments (probably Phragmites sp.). Dense network of very fine interwoven roots (1.5-2mm), occasional very small wood fragments. Thin laminae of 5Y 4/1 grey clay-silt towards base of unit. ---sharp/undulating contact---
2.45 - 2.455	10YR 8/1 white chalk pellet gravel. Clasts are rounded to sub-rounded (2-5mm), matrix supported in fine silt matrix. ---sharp/undulating contact---
2.455 - 2.48	10YR 3/2 very dark greyish brown organic silt with some clay. Frequent root fragments (probably in situ), occasional sub-angular flint clasts (2-3mm), occasional decayed chalk clasts (3-4mm). ---diffuse contact---
2.48 - 2.82	5GY 4/1 dark greenish grey clay-silt. Common thin rootlets penetrate from above. Blocky structure. Dense and compact. ---diffuse contact---
2.82 - 2.86	10YR 4/4 dark yellowish brown organic silt with common fine rootlets. Some possible sand and insects. ---diffuse contact---
2.86 -	5Y 4/1 dark grey clay-silt with blocky structure, common fine network of roots, larger unoxidised stem fragments (Phragmites sp.). Between 1.5m and 2.0m some evidence of 2.5Y 5/6 light olive brown mottling. Below 2.0m 5Y 2.5/1 black reduced organic staining, common Phragmites sp, heavily rooted. ---trench abandoned 4.00 m---

Table 10: Lithostratigraphy recorded in Trench 1006 TT

7.1.3 These deposits were laid down in wetland floodplain environments.

Trenches 1007 and 1008

7.1.4 Modern dumped deposits extended to at least 0.9 m below the ground surface in both of these trenches at which point the top of the Holocene sequence was recorded. Trench 1008 was deepened to 3.6 m and the sedimentary sequence recorded by M Bates (Fig. 19). The detailed log is presented in Table 11. Sediments present beneath made ground (below a depth of 1.10m) consisted of clay-silt units containing evidence for rooting and common wood/root fragments. No detailed structure was recorded in the sediments.

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Depth below surface (metres)	Lithostratigraphy		
Surface datum	3.0m O.D.	**Total depth**	3.6m
0.00 - 0.90	Fill/made ground ---sharp contact---		
0.90 - 1.10	10YR 4/1 dark grey blocky clay-silt. Flecks of charcoal, angular flint clasts (1-2cm) and metal objects. Massive and compact - probably made ground. ---diffuse contact---		
1.10 - 1.90	10YR 5/3 brown clay-silt. Common root and wood fragments with some evidence for rooting *in situ*. Massive with blocky structure. Becomes 10YR 5/2 greyish brown with depth. Fine network of roots. Soft and unconsolidated with black, reduced organic fragments. ---abrupt contact---		
1.90 -	N4 dark grey clay-silt with common black (reduced) roots (*in situ*) and some non-reduced roots. Massive and structureless. ---trench abandoned 3.6m---		

Table 11: Lithostratigraphy recorded in Trench 1008TT

7.1.5 The sediments present probably formed in low energy wetland/floodplain environments subject to intermittent flooding. Evidence for vegetation growth is indicated by the presence of rooting throughout the deposit.

7.2 Trenches 1009-1013TT

7.2.1 Modern dumped deposits were recorded in all of these trenches to at least 1.2 m below the ground surface. Only Trenches 1009TT and 1013TT were examined in detail and described below.

Trench 1009 (Fig. 20)

7.2.2 Throughout the trench, dumped layers of sand and chalk were observed to dip down towards the north and east. Within these layers, at the north end of the trench, three upright timbers (*137, 138, 139*) were recorded, surviving to the level of the local watertable. The timbers were not fully waterlogged and had been pierced by several iron bolts, indicating that they are of recent origin (Appendix 5).

7.2.3 At the southern end of the trench, greenish grey clay containing fragments of waterlogged wood (*136*) was recorded at a depth of 1.25 m (1.85 m OD), and the trench was subsequently deepened to investigate the sedimentary sequence. The lowest recorded layer, *157*, at between 3.5 and 3.0 m below ground surface (0.40 m below OD and 0.10 m OD) was a black peat. It was overlain by a blue-grey silty clay (*156*), 0.8 m thick. This was in turn overlain by a blue-grey clay (*155*), 0.6 m thick, which was

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overlain by layer *136*. Layer *136* yielded pottery of 2nd-century date. Soil sample 24 from layer *157* was dominated by poorly-preserved wood and twig fragments suggesting alder fen. Samples 22 and 23, from layers *155* and *156* respectively, were indicative of an open marshy reed swamp environment.

Trench 1013 (Fig. 19)

7.2.4 Made ground was recorded to a depth of 1.2 m. The west end of the trench was subsequently deepened to 3.0 m and the underlying sequence recorded by M Bates. The detailed log is presented in Table 12. The sequence is dominated by organic rich silts containing variable quantities of archaeological material (mainly ceramic building material) lying below the made ground. Silts with sand and organic remains occur between depths of 1.20 m and 2.20 m and towards the base large, non-flint stone blocks occur. Below 2.20 m very common large non-flint blocks (typically angular in shape) occur. Ceramic material was present within the deposits.

Depth below surface (metres)	**Lithostratigraphy**		
Surface datum	3.66m O.D.	**Total depth**	3.0m
0.00 - 1.20	Fill/made ground (see OAU context records). --sharp contact---		
1.20 - 1.60 [158]	7.5YR 3/2 dark brown silt with some sand - loose and friable. Some red CBM fragments (<1mm). No apparent structure. --diffuse contact---		
1.60 - 1.90 [159]	10YR 3/1 very dark grey silt with common organic remains (black and reduced). Common small flint clasts (<1cm), sub-rounded. Red CBM fragments present. Moist and plastic. No apparent structure. ---sharp contact---		
1.90 - 2.20 [160]	7.5YR N2 black organic rich silt. Firm and compact. No apparent structure. Common root fragments and occasional large flint blocks and large blocks of non-local stone. ---diffuse contact---		
2.20 - 2.80 [161]	7.5YR 3/2 dark brown clay-silt with common large flint and non-flint blocks (10 to +50cm). Common roots and plant fragments. Occasional red CBM fragments. ---not observed---		
2.80 - [162]	Very dense rubble/gravel. Red CBM fragments present. Some clay-silt matrix between clasts. Clast supported and loose. ---trench abandoned 3.0m---		

Table 12: Lithostratigraphy recorded in Trench 1013TT

7.2.5 These deposits appear to have been laid down within a wetland, probably low energy fluvial environment of deposition. Soil sample 25 from Layer *160* contains plant and insect species characteristic of marshy reed swamp with some open ground. The large clasts of non-flint material at the base of the sequence are not considered to be natural as tile of Roman date was also

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recovered, and they are considered unlikely to have been transported via natural processes. They probably represent dumping or collapse of nearby structures. Possible, direct evidence for construction activity at the base of the trench was noted by the presence of a single stake.

7.3 Trenches 1015TT, 1016TT, 1019-1021TT, 1023TT

7.3.1 Colluvial deposits were recorded in all of these trenches, overlain by modern dumped material associated with the landscaping of the sportsground. The top of the colluvial sequence was encountered at 3.31m OD in Trench 1015, rising to 5.79m in Trench 1023. Pottery, ceramic building material and occasional flint flakes were recovered from the upper part of the colluvial sequence in all trenches. The pottery includes sherds dated to the Late Bronze Age (Trenches 1019, 1020), Roman (Trenches 1015, 1016), Saxon (Trenches 1016, 1020) and a possible medieval sherd from Trench 1023. Of this group of trenches only Trenches 1016 and 1023 were deepened and excavated in detail as described below.

Trench 1016 (Fig. 19)

7.3.2 The top of the colluvial sequence was recorded at 0.25m below the modern ground surface (3.75m OD). A small hand-dug sondage was excavated through the upper colluvial deposits which were orange brown sandy silt (*1734*) overlying orange brown and brown silty sands (*1735, 1808, 1809*). Pottery of 2nd-century or later date was recovered from Layers *1734, 1808,* while sherds of Saxon pottery were recovered from Layer *1809.* The trench was subsequently deepened by machine to 3.3m below the ground surface, ceramic building material being recovered to a depth of 1.95m (2.05m OD). The colluvial sequence was recorded by M Bates and is presented in Table 13. The sediments consisted of variably clay or sand rich silts containing flint clasts, root traces and remnants of bed structures. The basal part of the sequence was carbonate rich. Remains of ceramic fragments were only noted in the upper part of the sequence (between 1.10m and 1.35m depth).

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Depth below surface (metres)	Lithostratigraphy		
Surface datum	4.0m O.D.	**Total depth**	3.3m
0.00 - 0.40	Fill/made ground		
	---sharp contact---		
0.40 - 1.10 (1734)	Orange-brown sandy silt		
	---not recorded---		
1.10 - 1.35 (1735) (1808) (1809)	10YR 5/4 yellowish-brown clay-silt. Dense, compact and structureless - massive. Occasional sub-angular flint clasts (<5cm). Occasional red CBM fragments. Common black charcoal fragments.		
	---diffuse contact---		
1.35 - 1.50 (1945)	10YR 5/6 brownish-yellow silty-sand to sandy-silt. Friable and structureless. Common black flecks. Occasional dendritic patterns of carbonate material. Empty root holes, common sub-angular flint clasts (2-5cm). Occasional struck flakes.		
	---graded contact---		
1.50 - 1.95	As above - flint clasts become rarer with depth.		
	---diffuse contact---		
1.95 - 2.65	10YR 7/4 very pale brown to 7.5YR 5/8 strong brown silty-sand. Very dense, compact and firm. Possibly bedded or containing elements of disrupted bedding. Patches of looser, less compact material locally. Some possible empty root canals. Coarsens with depth.		
	---graded contact---		
2.65 - 2.90	As above, 10YR 5/6 yellowish-brown silty-sand containing chalk clasts in matrix (c.3mm) and occasional Tertiary flint clasts. Looser than overlying unit.		
	---not observed---		
2.90 -	10YR 8/3 very pale brown firm carbonate-rich silt. Occasional rootlet fragments. Contains evidence of disrupted bedding/laminae.		
	---trench abandoned 3.30m---		

Table 13: Lithostratigraphy recorded in Trench 1016TT

7.3.3 The origin of these sediments is difficult to determine. Grain size characteristics and remnant structure indicate that deposition by either fluvial systems (medium energy levels) or colluvial downslope wash of material (previously deposited up-slope) is possible. On the basis of the valley base location, equivalent in datum with the low energy floodplain sediments of Trench 1013 TT, it is considered likely that they represent colluvial sediments resting on the valley sides.

Trench 1023 (Fig. 19)

7.3.4 Trench 1023 was also deepened and revealed a similar colluvial sequence to that seen in Trench 1016 and was therefore abandoned at 2.15m below the ground surface (4.34m OD). The colluvial sequence was recorded by M Bates and is presented in Table 14. The sequence consisted of sandy-silt and silty-sands containing angular flint clasts and occasional charcoal

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fragments, flint flakes, burnt flints and a sherd of possible medieval pottery, between depths of 0.53m and 1.80m depth. Below 1.80m depth a sand unit with disrupted bedding was noted.

Depth below surface (metres)	**Lithostratigraphy**
Surface datum	6.49m O.D. **Total depth** 2.15m
0.00 - 0.53	Made ground/fill ---sharp contact---
0.53 - 0.75	10YR 5/3 brown slightly sandy-silt. Dense and compact - no structure. Common angular flint clasts (2 to 4cm). Modern roots. ---diffuse contact---
0.75 - 1.50	7.5YR 4/6 strong brown slightly silty fine sand. Common coarse sub-angular flint clasts (2 to 4cm), black charcoal fragments, stuck flakes, burnt flints and pottery fragment. Dense and compact, structureless. Modern roots present. ---not observed---
1.50 - 1.80	As above - occasional chalk fragments. Decrease in numbers of flint clasts. ---abrupt contact---
1.80 -	10YR 6/6 brownish-yellow loose, fine sand. Bedded with disrupted bedding in places. No flints. Dense and compact ---trench abandoned 2.15m---

Table 14: Lithostratigraphy recorded in Trench 1023 TT

7.3.5 These deposits are difficult to interpret and similar inferences to those made regarding Trench 1016 TT are noted. Grain size characteristics and remnant structure indicate that deposition by either fluvial systems (medium energy levels) or colluvial downslope wash of material previously deposited up-slope is possible. On the basis of the valley base location, equivalent in datum with the low energy floodplain sediments of ARC 1013 TT, and the similarities with ARC 1016 TT it is considered more likely that they represent colluvial sediments resting on the valley sides.

7.4 Trenches 1022, 1024-1026TT

7.4.1 Modern dumped material, consisting of layers of chalk cobbles, cement waste, gravels and other waste products, was encountered in all of these trenches to a depth of at least 1.2m below ground level. Trench 1025 was deepened in attempt to determine whether colluvial deposits, as seen to the north-west, survived beneath the made ground but at 2.00m (5.20m OD) the trench sides collapsed and the trench was abandoned.

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7.5 Trenches 1240-1253TT, 1276-1282TT

7.5.1 All of these trenches were located to the east of the river Ebbsfleet to examine the Holocene sedimentary sequence and any associated archaeological deposits.

7.5.2 Trenches 1244 and 1249 were not excavated because of the close proximity of several underground service trenches. Trenches 1250, 1253, 1279, 1281 and 1282 lay within reed beds adjacent to the river and were not excavated. Trench 1277 also lay within the reed beds but was relocated to the north to allow excavation.

7.5.3 Deep recent dumped deposits were encountered in all trenches. In Trenches 1240-1243, 1245-1248, 1251 and 1252, these deposits were greater than 1.2m deep. Trenches 1240, 1241, 1248, 1252 and 1276 were all deepened beyond 1.2m to investigate the underlying deposits. In Trench 1241, dumped deposits were recorded to a depth of 2.0m below the ground surface (1.3m OD) at which point the instability of the trench sides coupled with the rapid inflow of water prevented further investigation.

Trenches 1252, 1277 and 1278

7.5.4 Peat deposits were encountered at depths of 2.0m (0.69m OD) in Trench 1252, 1.0m (1.58m OD) in Trench 1277 and 1.1m (1.43m OD) in Trench 1278. High water levels and the instability of the trench sides prevented further investigation.

Trench 1240 (Fig. 19)

7.5.5 The west end of this trench was deepened by machine to 5.0m below the ground surface (0.77m below OD). A sequence of organic silts was recorded and struck flint flakes were recovered from a depth of 3.6m below the ground surface, at the top of Layer 1949. The sedimentary sequence was recorded by M Bates and is presented in Table 15. The uppermost 2.5m consisted of fill/made ground. This overlay two peat units (between 2.50 m and 2.70m, and 3.90 m and 4.20 m below ground surface). Between these two peats, sediments consisted of clay-silts with a variable organic content and evidence for rooting. Below 4.20 m silty-sands overlay sands to a depth of 5.0 m. Well preserved wood was discovered in the lower peat unit between 3.90 m and 4.20 m depth (0.63 m and 0.33 m OD). Two pieces of burnt flints and twenty-three struck flakes were found within the sediments between 2.60m and 3.90m deep.

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Depth below surface (metres)	Lithostratigraphy		
Surface datum	4.23m O.D.	**Total depth**	5.0m
0.00 - 2.50	Fill/made ground. ---sharp contact---		
2.50 - 2.70	10YR 3/3 dark brown very organic silt to silty-peat. Dry, predominantly amorphous peat with some root material seen. Small rounded chalk clasts (<1cm) and molluscs in places. No structure. Occasional thin beds of chalk material and lenses of very fine flint granules (rolled and rounded). ---diffuse contact---		
2.70 - 2.80	5Y 4/2 olive grey organic silt. Common vertically aligned fine rootlets - probably *in situ*. ---graded contact---		
2.80 - 3.00	5GY 4/1 dark greenish-grey silt with less organic material than above. Common *Phragmites* sp. stem material. Cohesive and pliable. Contains patches of increased organic content of 5Y 4/2 olive grey colour and large patches of black reduced organic material. ---diffuse contact---		
3.00 - 3.60	10YR 3/3 dark brown organic rich silt. ---diffuse contact---		
3.60 - 3.90 (Context 1949)	10YR 4/3 brown organic silt. Dry and containing many unhumified *Phragmites* sp. fragments - vertically aligned and *in situ*. Occasional large (5 to 7cm) very well rounded flint clasts. Occasional chalk clasts. Burnt flints and struck flakes in places. ---not observed---		
3.90 - 4.20	5YR 3/2 dark reddish brown unhumified peat with common wood fragments - stem/trunk material with bark retained. Many root fragments are *in situ* - *Phragmites* sp. remains. Possible sub-horizontal partings. Non-compact. ---abrupt contact---		
4.20 - 4.80	5GY 5/1 greenish grey structureless sandy silt with some clay. Wood fragments, possibly roots, penetrate unit. Occasional angular/sub-angular flint clasts (2-4mm). Occasional white chalk flecks. ---sharp contact---		
4.80 - 5.00 (Context 1948)	5Y 5/2 olive grey medium sand with common, small (0.5 to 1cm) sub-angular flint clasts. Common white chalk fragments (<0.5cm), possible tufa/carbonate concretions. Possible shell fragments. Possibly bedded. Soft, unconsolidated. Fragments of plant stem material (possibly intruded from above). ---trench abandoned 5.00m---		

Table 15: Lithostratigraphy recorded in Trench 1240TT

7.5.6 These deposits were probably laid down within wetland or fluvial environments. The upper part of the sequence including the two peat units and intervening organic silts probably represent wetland floodplain sedimentation beginning and ending in drier episodes. The sands below the lower peat testify to higher energy environments of deposition in low to medium energy fluvial environments. Soil samples from Layers *1948* and *1949* (layer 1949 contained burnt flint and flakes) both indicate the presence of damp alder woodland.

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Trench 1248 (Fig. 19)

7.5.7 The west end of this trench was deepened to a depth of 4.7m below ground surface (0.89m below OD). Made ground, probably associated with the railway embankment, was recorded to a depth of 3.1m (0.71m OD). The underlying sedimentary sequence was recorded by M Bates and is presented in Table 16. The section revealed a sequence of peats and interbedded peat and organic silt lying below 3.1m of fill. Organic material was well preserved in the section and *in situ* roots were seen in places.

Depth below surface (metres)	**Lithostratigraphy**		
Surface datum	3.81m O.D.	**Total depth**	4.70m
0.00 - 3.10	Made ground - chalk and flint with grey silt matrix. Wood also noted. ---sharp contact---		
3.10 - 3.50	7.5YR 3/2 dark brown peat with common to very common well preserved *Phragmites* sp. stems (probably *in situ*). Fibrous and dry with a dense network of unhumified roots. ---not observed---		
3.50 - 4.70	Interbedded 7.5YR 3/2 dark brown peat with 5Y 4/1 dark grey clay-silt containing black, reduced organic fragments. ---test pit abandoned 4.70m---		

Table 16: Lithostratigraphy recorded in Trench 1248TT

7.5.8 These deposits are characteristic of sediments deposited in low energy wetland situations on the river floodplain where conditions alternated between wetter and drier episodes.

Trench 1276

7.5.9 The east end of this trench was deepened to a depth of 3m below the ground surface (0.36m below OD). Made ground was recorded to a depth of 1.4m (1.24m OD). The lowest deposit recorded was a blue-grey clay silty clay (*78*) at least 1.4m thick. It was overlain by a dark brown peat deposit (*42*) which was 0.25m thick. Environmental samples were taken from both of these layers. Sample 6 from Layer *78* contained species indicative of marshy conditions with some grassland. It also contained seeds of *Triglochin maritima* (sea arrowgrass) which is found in salt-marsh turf. Samples 1 and 5 from Layer *42* also contained species indicative of marshy conditions with some grassland but did not contain the maritime element.

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7.6 Trenches 1283-1286TT

7.6.1 Trench 1283 was not excavated because of the presence of a number of high voltage underground cables. Made ground was recorded to depth of greater than 1.2m in Trenches 1284-1286.

7.7 Trenches 1287-1302TT

7.7.1 Trenches 1293, 1294, 1296-1302 were not excavated as they were located in a narrow strip between a number of high voltage underground cables and the edge of the steep scarp dropping down to the river Ebbsfleet. However, three hand-dug test-pits, corresponding to Trenches 1293, 1294 and 1300, were excavated within this narrow strip, and in each case made ground was recorded to the base of the test-pit at 1m below the ground surface.

Trench 1287 (Fig. 21)

7.7.2 The depth of made ground in this trench varied from 0.4m at the west end to 0.7m at the east end (4.26m OD to 3.73m OD). It overlay a layer (*594*) of orange-brown, clay-silt, probably of colluvial origin. This layer sealed two archaeological features:

7.7.3 Ditch *598* was located at the west end of the trench and was orientated north - south. It was 2.2m wide and 0.85m deep and contained three fills. Roman tile and pottery was recovered from the upper fill, *595*, and struck flint flakes were recovered from the lower fill, *597*. Soil sample 62 from Fill *597* contained molluscs indicative of dry, open country. It also contained aquatic molluscs suggesting that the ditch may have carried flowing water or was liable to flooding.

7.7.4 Ditch *620* was located at the east end of the trench and was orientated east - west. It was 1.0m wide and 0.40m deep and terminated 2.6m from the east end of the trench. It contained a single fill, *619* which contained 4 struck flints and a sherd of possible prehistoric pottery. Soil sample 61 from Fill *619* contained molluscs indicative of dry, open country with some shade-loving species suggesting that the ditch became overgrown or that a hedge existed alongside the ditch.

Trenches 1288-1295, 1300, 1301

7.7.5 Machine excavation of Trenches 1290-1295, 1300, and 1301 was preceded by hand-excavation of $1m^3$ test-pits, all of which revealed made ground to the full depth of 1m. In the event, it proved impossible to machine excavate Trenches 1293, 1294 and 1300.

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7.7.6 Subsequent machine excavation of the other trenches demonstrated that the depth of made ground was greater than 1.2m in all of these trenches. The west end of Trench 1290 was further deepened to determine the depth of made ground. At a depth of 2.5m below the ground surface (7.05m OD), an orange-brown silty clay was recorded, which was interpreted as an undisturbed colluvial deposit.

7.8 Trenches 1303-1310TT

7.8.1 Trenches 1306 - 1308 were not excavated due to the presence of several high voltage underground power cables and mature willow trees lining the edge of the reed beds adjacent to the river Ebbsfleet.

7.8.2 Made ground was recorded to a depth of more than 1.2m in Trenches 1303 - 1305.

Trench 1309

7.8.3 Made ground was recorded to a depth of 1.0m at the west end of the trench and to 0.75m at the east end (4.79m OD to 4.50m OD). It overlay a mid brown sandy silt (*626*). This in turn overlay a mid brown clay silt (*627*), which produced a single struck flint and fragments of ceramic building material. These two deposits are interpreted as being of colluvial origin.

Trench 1310

7.8.4 This trench was excavated at the edge of the reed beds which line the course of the Ebbsfleet. Below about 0.5m below the ground surface (c1.90m OD) the inflow of ground water was so rapid that further machine excavation was continued beneath the water level and the deposits were recorded from the excavated spoil. Because the spoil was very liquid, recording was necessarily limited.

7.8.5 The lowest deposit recorded, between 2.5m and 1.7m below ground surface (0.1m below OD to 0.7m OD) was a coarse flint gravel in a silty clay matrix (*606*). Overlying this was a grey organic clay (*605*), 0.2m thick. Above this was a layer of peat (*604*), 0.05m thick. This in turn was overlain by a layer of clayey chalk (*603*), 0.05m thick, and probably a recent dumped deposit. The upper 0.4m of the sequence was a dark brown clay containing frequent roots. Samples 34 and 35, from layers *604* and *605* respectively, were both indicative of damp alder woodland.

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7.9 Trenches 1027TT, 1229-1233TT

7.9.1 Trenches 1027 and 1229 were not excavated due to the presence of several underground power cables.

Trenches 1230 and 1233

7.9.2 Made ground was recorded to a depth exceeding 1.2m (6.86m OD) in Trench 1230, and 1.4m (7.63m OD) in Trench 1233. Concrete slabs were encountered at the base of both trenches, associated with a former Blue Circle Industries washing plant.

Trenches 1231 and 1232

7.9.3 Made ground was recorded to a depth of 0.4m (7.56m OD) in Trench 1232 and between 0.4 and 0.6m (7.16m OD) in Trench 1231. In both cases it overlay a compacted chalky deposit containing lenses of orange brown silty sand and flint gravel. This is interpreted as the top of the Upper Coombe Rock of Pleistocene date.

7.9.4 Trench 1232 was subsequently selected to be deepened to investigate the Pleistocene deposits and the results are described in Section 5.

7.10 Trenches 1017TT, 1018TT, 1234TT

7.10.1 These trenches were located immediately to the south of the Northfleet 'Villa' Roman buildings.

Trenches 1017 and 1018

7.10.2 These trenches were located on the site of a former electricity sub-station. Concrete foundations and floors associated with the sub-station were recorded in both trenches. Made ground was recorded to a depth of 1.2m (5.21m OD) in Trench 1017. A concrete slab beneath a thin layer of rubble was recorded in Trench 1018. The trench was abandoned when a cable was detected beneath the slab.

Trench 1234

7.10.3 This trench was located 4m to the south of the main west - east wall of the Roman building. A sherd of possible Saxon pottery was recovered from a colluvial deposit (*1848*) underlying the modern topsoil. At both ends of the trench, recently back-filled trenches were recorded, orientated north to south. These coincide with the line of walls recorded on the 1913 plan of the Northfleet villa and are probably trenches excavated by the Thameside Archaeological Group to trace the walls. No wall footings survive and they may have been completely excavated,

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either by Steadman or by TAG. No other features were recorded.

7.11 Trenches 1014TT, 1235TT, 1236TT

7.11.1 These trenches were located to the north of the Northfleet villa, between the known buildings and the course of the Ebbsfleet.

Trench 1014

7.11.2 This trench was located about 10m to the north of the Roman wall foundations exposed in the TAG trenches. The lowest deposit recorded was an orange brown silty sand at a depth of 1.35m below the ground surface (2.91m OD) and dipping gently towards the north. It was similar to the deposit which the wall foundations were seen to cut. It was overlain by a mid brown sandy silt, 0.45m thick and also dipping towards the north. This is interpreted as a colluvial deposit. It was in turn overlain by a layer of sandy silt (*1850*), 0.12m thick, containing frequent fragments of ragstone, chalk, tile, and a sherd of 2nd-century pottery, which may derive from the construction or demolition of the Roman buildings. Overlying this was a series of sandy silts up to 0.9m thick, containing frequent fragments of Roman tile. The origin of these deposits is not clear: they may represent deliberate levelling of the area during the Roman period, or they may be later colluvial deposits. They were overlain by modern topsoil, 0.15m thick.

Trench 1235 (Fig. 21)

7.11.3 The southern end of this trench was located about 4m to the north of the furthest extent of wall foundations recorded by Steadman. Beneath the modern topsoil there was a chalk rubble filled feature (*1941*) of recent origin. It was cut into a series of sandy loams (*1812-1815*), containing frequent fragments of Roman tile and several sherds of 4th-century pottery, similar to those seen in Trench 1014. These deposits were up to 1.2m thick. Below them, at a depth of 1.4m below the ground surface (2.38 m OD), was a series of deposits filling a cut feature (*1919*) 1.4 m deep. The lowest deposits were grey clays (*1940, 1921, 1918*) containing fragments of burnt clay and charcoal. Within Layer *1918* several thin lenses of charcoal were recorded. The clays were overlain by a sandy silt, *1917*.

7.11.4 The layers above Deposit *1917* probably fill a later re-cut of the feature. Fragments of charcoal and burnt clay were found throughout these deposits, Fill *1908* being particularly rich in charcoal. Tile and pottery was also recovered, the pottery dating to the 1st-2nd-century.

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Trench 1236 (Fig. 22)

7.11.5 This trench was initially machined to a depth of 1.2m. It was subsequently deepened to 2.2 m (1.52 m OD) at the western end of the trench. Made ground was recorded to a depth of 0.4m below ground surface (3.32 m OD). Underlying this was a sequence of clay sands (*1835-1837*) and clay silts (*1865-1867*). Roman tile, bone and flint flakes were recovered from the sequence, and pottery of Iron Age, Roman and Saxon date was recovered from Layers *1835* and *1837*. The origin of these deposits was unclear, but the close proximity to the course of the Ebbsfleet suggests that the lower part of the sequence, at least, may be alluvial. The edge of a linear feature, orientated east - west, was recorded underlying Layer *1867* but could not be investigated due to the depth of the trench.

7.12 Trenches 1237-1239TT

7.12.1 These trenches were located to the east of the Northfleet villa. Trench 1237 was located close to the course of the Ebbsfleet, while Trenches 1238 and 1239 were immediately adjacent to the furthest extent of the villa buildings as recorded by Steadman.

Trench 1237 (Fig. 23)

7.12.2 Underlying the modern topsoil there was a sequence of clay sands (*1739, 1740*) and sandy silts (*1741, 1742, 1743, 1987*), 1.1-1.3 m deep. Flint flakes and tile were recovered from layers *1741, 1742, 1743*. Pottery of 2nd-century or later date was recovered from Layer 1742, while Layer 1743 yielded Saxon pottery. This sequence is similar to that recorded in Trench 1236, 35m to the north-west, and is probably also of alluvial origin. Several archaeological features were recorded underlying these deposits at a depth of 1.1 m below the ground surface (2.00m OD). At the southern end of the trench, a layer of dark grey silt (*1805*), containing very frequent burnt flints and charcoal fragments, filled a shallow cut (*1846*) up to 0.3 m deep. Layer *1805* yielded a single sherd of pottery, possibly dating to the 1st- to 2nd-century. There was no evidence of reddening of the underlying deposit, suggesting that the flints were not burned *in situ*.

7.12.3 Fill *1805* was cut to the north by ditch *1806*, 3.4 m wide and 0.9 m deep, and orientated east - west. The lowest fill (*1845*) was a dark grey clay sand containing frequent burnt flints, and probably derived in part from Layer *1805* when the ditch was first cut. Fill *1804* contained pottery of 2nd-century date, tile, bone and flint flakes, although some of these finds may have derived from the underlying fill (*1963*) as the depth of the trench made excavation difficult.

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7.12.4 To the north of Ditch *1806*, there was a sub-circular patch of dark grey sandy clay (*1942*), 0.5 m in diameter and 0.05 m thick, containing very frequent burnt flints and charcoal fragments. There was no reddening of the underlying deposit, again indicating that the flints were not burnt *in situ*.

Trench 1238 (Fig. 23)

7.12.5 Trench 1238 was located immediately to the east of the probable eastern limit of the villa buildings, and to the south of the site of a lime kiln recorded by Steadman.

7.12.6 A series of intercutting features was recorded below the modern topsoil and an underlying subsoil, at a depth of 0.35 m (3.98 m OD). Pit *1893* was not fully exposed in plan, but was at least 0.78m wide and 0.70m deep, and contained two fills. The lower fill, *1892*, produced pottery dated to the 2nd-century or later. Pit *1890* was at least 0.95m wide and 1.10m deep. Fill *1886* produced tile. Fill *1863* yielded bone, flint flakes, tile, and pottery dated to the 2nd-century. Pit *1885*, which cut both *1890* and *1893*, was at least 4.4m wide and more than 1.2m deep. Pottery was recovered from fills *1884, 1862, 1860, 1859, 1964* and *1858*. Most of the pottery dates to the 1st- to 2nd-century or later, but includes 4th-century pottery from Fill *1859*.

Trench 1239 (Fig. 22)

7.12.7 Trench 1239 was located on a distinct mound to the east of the site of the Northfleet villa. Excavation demonstrated that the mound is composed of recent dumped material, probably a spoil heap associated with quarrying earlier this century. The western end of the trench was deepened and, beneath the spoil heap at a depth of between 1.3 and 1.9 m below the ground surface (4.31-3.91m OD), *in situ* deposits were recorded. At the base of the deepened trench, 2.2m below the ground surface (3.51m OD), one edge of a linear feature was recorded, orientated north-west to south-east. The depth of the trench precluded investigation of the feature.

7.13 Test-pits 2021TP and 2022TP

7.13.1 Two hand-dug test-pits were excavated at the north end of a large flooded quarry pit, known as the Blue Lake, to determine whether the area had been quarried in the past.

Test-pit 2021

7.13.2 A sequence of silty and sandy clays, 1.2 m deep, was recorded below modern topsoil. No artefactual material was recovered.

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Test-pit 2022

7.13.3 The upper 0.3-0.6 m consisted of recent dumped material. Underlying this, to the base of the pit at 1.2 m below ground level, was a homogeneous, clay loam, *47*, which yielded a single small sherd of possibly 1st-2nd century pottery.

8 THE 'VILLA' TRENCH DESCRIPTIONS (Figs 4 and 5)

8.1 Roman wall foundations were planned in trenches left open after a series of excavations during the 1970s and 1980s (see 1.1.7 above). In addition, the positions of several back-filled or partially back-filled trenches were also recorded.

8.2 Enough of the wall foundations are still exposed to relate them, with a reasonable degree of confidence, to the plan produced during Steadman's excavations (Fig 6). In most areas examined, earlier excavation had removed any associated or earlier archaeological deposits, as well as the upper part of the underlying sterile colluvial deposits down to the base of the wall footings. The walls themselves had in most instances been left upstanding in the trenches.

8.3 Wall *1707* (Fig. 4) was constructed of randomly coursed, roughly-dressed ragstone facing stones with a flint and ragstone rubble core and mortar bonding. It was 0.9 m wide, 0.4 m deep, and a length of 5 m survived, orientated east - west. To the east it was truncated by an electricity cable trench. To the east of the cable trench, Wall *1737* continued the alignment of *1707*, but was of a different build. It was 0.5 m wide, 0.15 m deep, and a length of 15m was exposed in the trench. It was constructed of uncoursed flint rubble with occasional ragstone fragments in sandy mortar matrix.

8.4 Wall *1709* butted against *1707* and continued its line to the west. It was constructed of rough ragstone fragments without mortar bonding and only a single course survived. It was 0.6 m wide and 0.2 m deep and extended for 12 m.

8.5 Wall *1703* (same as *1708*) and *1755* were 3 m apart and orientated from north - south. The northern end of *1703* overlay wall footing *1707*, and *1755* butted against *1707*. Both were constructed of flint and ragstone rubble bedded in brown sandy mortar. *1703* overlay an earlier footing, Wall *1706*, which was constucted of flint nodules and ragstone fragments and survived to a depth of 0.1 m.

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8.6 The line of Walls *1709, 1707,* and *1737* was continued in a second trench 20m to the east (Fig. 5). Wall *1724* was constructed of randomly coursed flint nodules and ragstone fragments bedded in pale brown mortar. It was 0.7 m wide, 0.30 m deep and a length of 12 m was exposed within the trench. To the west it was truncated by an earlier excavation trench. To the east, it abutted Wall *1754.* Underlying *1724* was a layer (*1725* and *1716*) of mottled brown and grey sandy silt containing flecks of charcoal, ceramic building material and pottery of 2nd-century or later date.

8.7 Wall *1754,* orientated north - south, was constructed of uncoursed flint nodules with occasional ragstone fragments bedded in an orange-brown sandy mortar. It was 0.6 m wide, 0.3 m deep, and a length of 3.3 m was exposed within the trench.

8.8 Wall *1753,* 5 m to the east of *1754,* was orientated north - south. It was constructed of uncoursed ragstone with occasional flint nodules bedded in pale yellow sandy mortar. It was 0.4 m wide, 0.2 m deep, and a length of 1.5 m was exposed. It was truncated at its north end by earlier excavation.

8.9 Wall *1752* was orientated north - south with a right-angle return to the east at its southern end. It was constructed of flint nodules with occasional ragstone fragments set in a light brown sandy mortar. It was 0.5 m wide, 0.3 m deep and a length of 6 m was exposed. The east - west return wall extended for 0.5 m after which it appears to have slumped to the north.

8.10 Another probable wall-footing, *1747,* was partially exposed in (Fig. 5 - Section A) section immediately to the east of *1752,* but did not survive in plan. Its alignment was uncertain but was probably north - south. It was constructed of flint nodules, ragstone and chalk fragments in an orange-brown sandy mortar. It was cut by Feature *1745,* a recently back-filled cut which may have been a ditch or wall foundation trench, although it could have been an exploratory trench excavated by the Thameside Archaeological Group.

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9 ARCHAEOLOGICAL CONTEXT INVENTORY

Note: Contexts with no trench number refer to trenches left open by TAG - see section 3.7 above - which OAU recleaned and recorded.

Column 5: Stratigraphic relationships; fo = fill of, fb = filled by

TR	CXT	TYPE	PERIOD	ASSOCIATION	FINDS
1278	1	topsoil	modern	over 1	
1278	2	dumped layer	modern	under1 over 3	
1278	3	dumped layer	modern	under 2 over 4	
1278	4	peat layer	Holocene	under 3	
1280	5	topsoil	modern	over 6	
1280	6	dumped layer	modern	under 5 over 7	
1280	7	dumped layer	modern	under 6 over 8	
1280	8	dumped layer	modern	under 7 over 9	
1280	9	dumped layer	modern	under 8 over 10	
1280	10	dumped layer	modern	under 9 over 11	
1280	11	dumped layer	modern	under 10 over 12	
1280	12	dumped layer	modern	under 11	
1311	13	topsoil	modern	over 14	
1311	14	dumped layer	modern	under 13	
1252	15	topsoil	modern	over 16	
1252	16	dumped layer	modern	under 16	
1248	17	topsoil	modern	over 18	
1248	18	dumped layer	modern	under 17 over 19	
1248	19	dumped layer	modern	under 18 over 20	
1248	20	dumped layer	modern	under 19 over 21	
1248	21	dumped layer	modern	under 20	
1246	22	topsoil	modern	over 23	
1246	23	dumped layer	modern	under 22 over 24	
1246	24	dumped layer	modern	under 23 over 25	
1246	25	dumped layer	modern	under 24 over 26	
1246	26	dumped layer	modern	under 25 over 27	
1246	27	dumped layer	modern	under 26 over 28	
1246	28	dumped layer	modern	under 27	
1247	29	topsoil	modern	over 30	
1247	30	dumped layer	modern	under 29 over 31	
1247	31	dumped layer	modern	under 30 over 32	
1247	32	dumped layer	modern	under 31 over 33	
1247	33	dumped layer	modern	under 32 over 33	
1247	34	dumped layer	modern	under 33	
1276	35	topsoil	modern	over 36	
1276	36	dumped layer	modern	under 35 over 37	
1276	37	dumped layer	modern	under 36 over 38	
1276	38	dumped layer	modern	under 37 over 39	
1276	39	dumped layer	modern	under 38 over 40	
1276	40	dumped layer	modern	under 39 over 41	pot , building material
1276	41	dumped layer	modern	under 40 over 42	
1276	42	peat layer	Holocene	under 41 over 78	burnt flint
2022	43	topsoil	modern	over 44	pottery
2022	44	dumped layer	modern	under 43 over 45	
2022	45	dumped layer	modern	under 44 over 46	
2022	46	dumped layer	modern	under 45 over 47	
2022	47	dumped layer	modern	under 46	pottery, flint, burnt flint, building material
2021	48	topsoil	modern	over 49	
2021	49	dumped layer	modern	under 48 over 50	
2021	50	dumped layer	modern	undeer 49 over 51	
2021	51	dumped layer	modern	under 50 over 52	
2021	52	dumped layer	modern	under 51 over 53	
2021	53	dumped layer	modern	under 52 over 54	

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TR	CXT	TYPE	PERIOD	ASSOCIATION	FINDS
2021	54	dumped layer	modern	under 53	
1251	55	topsoil	modern	over 56	
1251	56	dumped layer	modern	under 55 over 57	
1251	57	dumped layer	modern	under 56 over 58	
1251	58	dumped layer	modern	under 57	
1277	59	topsoil	modern	over 60	
1277	60	dumped layer	modern	under 59 over 61	
1277	61	dumped layer	modern	under 60 over 62	
1277	62	peat layer	Holocene	under 61	
1248	63	dumped layer	modern	under 21	
1245	64	topsoil	modern	over 69	
1245	65	dumped layer	modern	under 70 over 66	
1245	66	dumped layer	modern	under 56 over 67	
1245	67	dumped layer	modern	under 66 over 68	
1245	68	dumped layer	modern	under 67	
1245	69	dumped layer	modern	under 64 over 70	
1245	70	dumped layer	modern	under 69 over 65	
1240	71	topsoil	modern	over 72	
1240	72	dumped layer	modern	under 71 over 73	
1240	73	dumped layer	modern	under 72 over 74	
1240	74	dumped layer	modern	under 73 over 75	
1240	75	dumped layer	modern	under 74 over 76	
1240	76	dumped layer	modern	under 75 over 77	
1240	77	dumped layer	modern	under 76	pottery
1276	78	layer	Holocene	under 42	
1243	79	topsoil	modern	over 80,90.84	
1243	80	dumped layer	modern	under 79 over 81	
1243	81	dumped layer	modern	under 80 over 82	
1243	82	dumped layer	modern	under 81 over 83	
1243	83	dumped layer	modern	under 82 over 84	
1243	84	dumped layer	modern	under 83 over 85	
1243	85	dumped layer	modern	under 84 over 90	
1243	86	dumped layer	modern	under 85 over 140	
1243	87	dumped layer	modern	under 140 over 89	
1243	88	dumped layer	modern	under 140 over 89	
1243	89	dumped layer	modern	under 87 over 142	
1243	90	dumped layer	modern	under 147 over 92	
1243	91	dumped layer	modern	under147 over 92	
1243	92	dumped layer	modern	under 91 over 93	
1243	93	dumped layer	modern	under 92 over 141	
1243	94	dumped layer	modern	under 141	
1241	95	topsoil	modern	over 96	
1241	96	dumped layer	modern	under 95 over 97	
1241	97	dumped layer	modern	under 96 over 98	
1241	98	dumped layer	modern	under 97 over 99	
1241	99	dumped layer	modern	under 98 over 100	
1241	100	dumped layer	modern	under 99 over 101	
1241	101	dumped layer	modern	under 100 over 102	
1241	102	dumped layer	modern	under 101 over 103	
1241	103	dumped layer	modern	under 102	
1242	104	topsoil	modern	over 105	
1242	105	dumped layer	modern	under 104 over 106	
1242	106	dumped layer	modern	under 105 over 107	
1242	107	dumped layer	modern	under 106 over 108	
1242	108	dumped layer	modern	under 107 over 109	
1242	109	dumped layer	modern	under 108 over 110	
1242	110	dumped layer	modern	under 109 over 112,111	
1242	111	dumped layer	modern	under 110	
1242	112	dumped layer	modern	under 110 over 113	
1242	113	dumped layer	modern	under 112 over 113	
1013	114	dumped layer	modern	over 115	
1013	115	dumped layer	modern	under 114 over 116	
1013	116	dumped layer	modern	under 115 over 117	
1013	117	dumped layer	modern	under 116 over 118	
1013	118	dumped layer	modern	under 117 over 119	

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TR	CXT	TYPE	PERIOD	ASSOCIATION	FINDS
1013	119	dumped layer	modern	under 118	
1012	120	hard standing	modern	over 121	
1012	121	dumped layer	modern	under 120 over 122	
1012	122	dumped layer	modern	under 121 over 123	
1012	123	dumped layer	modern	under 122 over 124	
1012	124	dumped layer	modern	under 123	
1009	125	topsoil	modern	over 126	
1009	126	dumped layer	modern	under 125 over 127	
1009	127	dumped layer	modern	under 126 over 128	
1009	128	dumped layer	modern	under 127 over 130,129	
1009	129	dumped layer	modern	under 128	
1009	130	dumped layer	modern	under 128 over 131	wood
1009	131	dumped layer	modern	under 130 over 132	
1009	132	dumped layer	modern	under 131 over 133	
1009	133	dumped layer	modern	under 132 over 134	
1009	134	dumped layer	modern	under 133 over 135	
1009	135	dumped layer	modern	under 134 over 136	building material
1009	136	layer	Holocene (?Roman)	under 135	flint, building material, pottery
1009	137	post	modern	under 130,128	Fe obj
1009	138	post	modern	under 128,130	Fe obj
1009	139	post	modern	under 128,130	Fe obj
1243	140	dumped layer	modern	under 84 over 90 same as 85	
1243	141	dumped layer	modern	under 87 over 142 same as 89	
1010	142	topsoil	modern	over 143	pottery
1010	143	dumped layer	modern	under 142 over 144	
1010	144	dumped layer	modern	under 143 over 143	
1010	145	dumped layer	modern	under 144 over 146	
1010	146	dumped layer	modern	under 145 over 147	
1010	147	dumped layer	modern	under 146 over 150	pottery, bone
1243	148	dumped layer	modern	under 85 over 140 same as 86	
1243	149	dumped layer	modern	under 87 over 142 same as 89	
1010	150	dumped layer	modern	under 147 over 151	
1010	151	organic layer		under 150	
1011	152	topsoil	modern	over 153	flint
1011	153	dumped layer	modern	under 152	glass
1276	154	dumped layer	modern	under 39 over 40	
1009	155	organic layer	Holocene	under 136 over 156	
1009	156	organic layer	Holocene	under 155 over 157	
1009	157	organic layer	Holocene	under 156	
1013	158	dumped layer	modern	under 118 over 159	
1013	159	dumped layer	modern	under 158 over 160	building material
1013	160	organic layer	Roman	under 159 over 161	
1013	161	organic layer	Roman	under 160 over 162	building material,pottery
1013	162	organic layer	Roman	under 161	
1292	500	topsoil	modern	over 501	
1292	501	dumped layer	modern	under 500 over 502	
1292	502	dumped layer	modern	under 501 over 503	
1292	503	dumped layer	modern	under 502 over 504	
1292	504	dumped layer	modern	under 503 over 505	
1292	505	dumped layer	modern	under 504 over 506	Fe nail, bone, glass, building material, pottery
1292	506	dumped layer	modern	under 505	
1292	507	test pit			
1293	508	testpit			
1293	509	topsoil	modern	over 510	
1293	510	dumped layer	modern	under 509 over 511	
1293	511	dumped layer	modern	under 510 over 512	
1293	512	dumped layer	modern	under 511 over 513	
1293	513	dumped layer	modern	under 512 over 514	

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TR	CXT	TYPE	PERIOD	ASSOCIATION	FINDS
1293	514	dumped layer	modern	under 513 over 515	
1293	515	dumped layer	modern	under 514 over 516	
1293	516	dumped layer	modern	under 151 over 517	
1293	517	dumped layer	modern	under 516	
1291	518	topsoil	modern	over 581	
1291	519	dumped layer	modern	under 585 over 520, part of 579	pottery
1291	520	dumped layer	modern	under 519 , part of 579	bone, glass, building material, pottery
1291	521	test pit			
1290	522	test pit			
1290	523	topsoil	modern	over 524, 527	
1290	524	dumped layer	modern	under 523 over 525	
1290	525	dumped layer	modern	under 524 over 526 , same as 527	
1290	526	dumped layer	modern	under 525 over 527 , same as 528,530	
1290	527	dumped layer	modern	under 526 over 528 , same as 525	
1290	528	dumped layer	modern	under 527 over 529 , same as 526,530	
1290	529	dumped layer	modern	under 528 over 530 , same as 531	
1290	530	dumped layer	modern	under 529 over 531 , same as 526,528	
1290	531	dumped layer	modern	under 530 , same as 529	
1300	532	test pit			
1300	533	topsoil	modern	over 534	
1300	534	dumped layer	modern	under 533 over 535	glass, building material
1300	535	dumped layer	modern	under 534	
1294	536	topsoil	modern	over 537	
1294	537	dumped layer	modern	under 536 over 538	
1294	538	dumped layer	modern	under 537 over 539	
1294	539	dumped layer	modern	under 538 over 540	
1294	540	dumped layer	modern	under 539 over 541	
1294	541	dumped layer	modern	under 540 over 542	
1294	542	dumped layer	modern	under 541 over 543	
1294	543	dumped layer	modern	under 542 over 544	
1294	544	dumped layer	modern	under 543	
1294	545	test pit			
1301	546	test pit			
1301	547	topsoil	modern	over 548	
1301	548	dumped layer	modern	under 547 over 549	
1301	549	dumped layer	modern	under 548 over550	
1301	550	dumped layer	modern	under 549 over 551	
1301	551	dumped layer	modern	under 550	
1295	552	testpit			
1295	553	topsoil	modern	over 554,587	
1295	554	dumped layer	modern	under 553	building material, pottery
1284	555	topsoil	modern	over 556	
1284	556	dumped layer	modern	under 555 over 557	
1284	557	dumped layer	modern	under 556 over 558	
1284	558	dumped layer	modern	under 557 over 559	
1284	559	dumped layer	modern	under558	building materials
1286	560	topsoil	modern	over 561	
1286	561	dumped layer	modern	under 560 over 562	
1286	562	dumped layer	modern	under 561 over 563	
1286	563	dumped layer	modern	under 562 over 564 , same as 557	
1286	564	dumped layer	modern	under 563 over 565	
1286	565	dumped layer	modern	under 564	
1288	566	topsoil	modern	over 567	
1288	567	dumped layer	modern	under 566 over 568	
1288	568	dumped layer	modern	under 567 over 569	
1288	569	dumped layer	modern	under 568 over 570	

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TR	CXT	TYPE	PERIOD	ASSOCIATION	FINDS
1288	570	dumped layer	modern	under 569	
1289	571	topsoil	modern	under 575 over 572	
1289	572	dumped layer	modern	under 571 over 573	
1289	573	dumped layer	modern	under 572 over 574	
1279	574	dumped layer	modern	under 573	
1289	575	dumped layer	modern	over 571	
1290	576	dumped layer	modern	under 577	
1290	577	dumped layer	modern	under 523 over 576	
	578	void	void	void	
1291	579	dumped layer	modern	consists of 519,520	
1291	580	dumped layer	modern	consists of 581,582,583,584,585	
1291	581	dumped layer	modern	under 518 over 582 , part of 580	
1291	582	dumped layer	modern	under 581 over 583 , part of 580	
1291	583	dumped layer	modern	under 582 over 584 part of 580	
1291	584	dumped layer	modern	under 583 over 585, part of 580	
1291	585	dumped layer	modern	under 584 over 519 , part of 580	
	586	void	void	void	
1295	587	dumped layer	modern	under 553 over 558,554	
1295	588	dumped layer	modern	under 587,584	
1287	589	topsoil	modern	over 580	
1287	590	dumped layer	modern	under 589 over 591	
1287	591	dumped layer	modern	fo 592,under 590,	
1287	592	cut	modern	fb 591, cuts 593	
1287	593	colluvium	?post-Roman	under 592, over 594,cut by 592	
1287	594	colluvium	?post-Roman	under 593 over 595	
1287	595	fill	Roman	fo 598 under 594 over 596	pottery, building material,
1289	596	fill	Roman	fo 598 under 595 over 597	
1287	597	fill	Roman	fo 598 under 596	flint
1287	598	ditch	Roman	cuts 599 , filled by 597,596,595	pottery, flint
1287	599	colluvium	Holocene	under 594 , cut by 598	
1290	600	dumped layer	modern	under 576 over 601	
1290	601	colluvium	Holocene	under 600	
1310	602	clay layer	modern	over 603	
1310	603	dumped layer	modern	under 602 over 604	
1310	604	peat layer	Holocene	under 603 over 604	
1310	605	organicclay	Holocene	under 604 over 606	
1310	606	gravel	?Pleistocene	under 605	
1304	607	topsoil	modern	over 608	
1304	608	dumped layer	modern	under 607 over 609	
1304	609	dumped layer	modern	under 608	
1305	610	topsoil	modern	over 611	
1305	611	dumped layer	modern	under 610 over 612	
1305	612	dumped layer	modern	under 611 over 614	
1305	613	dumped layer	modern	under 615 over 616	
1305	614	dumped layer	modern	under 612 over 615	
1305	615	dumped layer	modern	under 614 over 613	
1305	616	dumped layer	modern	under 613 over 617	
1305	617	dumped layer	modern	under 161 over 618	
1305	618	dumped layer	modern	under 617	
1287	619	fill	Roman	fo 620 under 594	pottery, flint, burnt flint
1287	620	ditch	Roman	cuts 599 filled by 619	
	621	void	void	void	
	622	void	void	void	
1309	623	topsoil	modern	over 624	
1309	624	dumped layer	modern	under 623 over 625	
1309	625	dumped layer	modern	under 624 over 626	

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TR	CXT	TYPE	PERIOD	ASSOCIATION	FINDS
1309	626	colluvium	?post-Roman	under 625 over 627	
1309	627	colluvium	?post-Roman	under 626	building material, pottery, flint
	628	void	void	void	
	629	void	void	void	
	630	void	void	void	
1303	631	topsoil	modern	over 632	
1303	632	dumped layer	modern	under 631 over 633	
1303	633	dumped layer	modern	under 632 over 634	
1303	634	dumped layer	modern	under 633 over 635	
1303	635	dumped layer	modern	under 634 over 636	
1303	636	dumped layer	modern	under 635 over 637	
1303	637	dumped layer	modern	under 636	
1008	1300	topsoil	modern	over 1301	
1008	1301	dumped layer	modern	under 1300 over 1303	
1008	1302	clay-silt layer	Holocene	under 1303	
1008	1303	landfill	modern	under 1301 over 1302	
1004	1304	topsoil	modern	over 1305	
1004	1305	dumped layer	modern	under 1304 over 1306	
1004	1306	dumped layer	modern	under 1305 over 1307	
1004	1307	dumped layer	modern	under 1306 over 1308	
1004	1308	dumped layer	modern	under 1307	
1005	1309	dumped layer	modern	under 1304 over 1310	
1005	1310	dumped layer	modern	under 1309 over 1311	
1005	1311	dumped layer	modern	under 1310 over 1312	
1005	1312	dumped layer	modern	under 1311 over 1313	
1005	1313	dumped layer	modern	under 1312 over 1315	
1005	1314	dumped layer	modern	under 1315 over 1316	
1005	1315	dumped layer	modern	under 1313 over 1314	
1005	1316	dumped layer	modern	under 1314 over 1317	
1005	1317	dumped layer	modern	under 1316 over 1318	
1005	1318	dumped layer	modern	under 1317	
1006	1319	topsoil	modern	over 1320	
1006	1320	dumped layer	modern	under 1319 over 1321	
1008	1321	dumped layer	modern	under 1320 over 1322	
1006	1322	dumped layer	modern	under 1321 over 1323	
1006	1323	peat layer	Holocene	under 1322 over 1324	
1006	1324	organic silt	Holocene	under 1323	
2018	1500	layer	LBA	over 1501	flint, burnt flint
2018	1501	layer	Holocene	under 1500	
2019	1502	dumped layer	modern	over 1503	
2019	1503	colluvium	Holocene	under 1502	
	1700	topsoil	modern	over 1702 , 1713	
	1701	colluvium	Holocene	under 1713,1602,same as 1712	
	1702	dumped layer	modern	under 1700 over 1701	
	1703	ragstone wall	Roman	over 1704,same as 1708	
	1704	mortar for wall	Roman	part of 1703	
	1705	void	void	void	
	1706	wall foundation	Roman	under 1703 over 1701	
	1707	ragstone wall	Roman	under 1708,1709 over 1710	
	1708	wall	Roman	under 1714 over 1707	
	1709	wall	Roman	under 1714 over 1707	
	1710	construction cut	Roman	under 1707 over 1712	
	1711	dumped layer	modern	fo 1714 , same as 1702	
	1712	colluvium	Holocene	under 1710,1713,same as 1701	
	1713	dumped layer	modern	under 1714 over 1712	
	1714	trench	modern	fb 711	
	1715	dumped layer	modern	under 1717 over 1700	
	1716	fill		fo 1730, under 1720,cut by 1717	
	1717	wall construction	Roman	cuts 1700,1716, fb 1724,1720,1729,under 1716	
	1718	mortar	Roman	part of 1724	
	1719	topsoil	modern	over 1720	

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TR	CXT	TYPE	PERIOD	ASSOCIATION	FINDS
	1720	fill	modern	fo 1721 under 1719	flint
	1721	trench	modern		
	1722	backfill	modern	cut by 1721 fo 1723	
	1723	trench	modern		
	1724	wall	Roman	under 1723 over 1725	
	1725	layer	Roman	under 1724 over 1226	pottery, flint, shell, bone, building materials
	1726	layer	Roman	under 1725 over 1717	
	1727	layer	Roman	under 1726 over 1728	
	1728	layer	Roman	under 1727	
	1729	fill	Roman	part of 1724	
	1730	feature	Roman	cuts 1700, fb 1700, cut by 1717	
1016	1731	topsoil	modern	over 1732	
1016	1732	dumped layer	modern	under 1731 over 1733	
1016	1733	buried topsoil	modern	under 1732 over 1734, same as1764,1759,1769,1779	
1016	1734	colluvium	?post Roman	under 1733 over 1735	building material, pottery, flint
1016	1735	colluvium	?post Roman	under 1734 over 1808	
	1736	wall	Roman	over 1734 , part of 1724	
	1737	wall	Roman	over 1701	
1237	1738	topsoil	modern	over 1739	
1237	1739	dumped layer	modern	under 1738 over 1740	
1237	1740	dumped layer	modern	under 1739 over 1741	
1237	1741	alluvium	(post-)Roman	under 1741 over 1743	flint, building materials, bone, burnt flint
1237	1742	alluvium	(post-)Roman	under 1741, over 1743	burnt flint, building material, pottery,
1237	1743	alluvium	(post-)Roman	under 1742 over 1737	pottery, flint, building materials, burnt flint
	1744	backfill	modern	fo 1745	
	1745	ditch	?Roman	cuts 1701,1747, fb 1744,part of 1750?	
	1746	dumped layer	modern	under 1719 over 1749	
	1747	wall foundation	Roman	fo 1748, cut by 1745,1749	
	1748	foundation trench	Roman	fb 1747, cuts 1701	
	1749	trench	modern	cuts 1756,1747,1701, fb 1746	
	1750	linear feature	Roman	cuts 1701 fb 1744	
	1751	backfill	modern	cut by 1749,under 1719 over 1701	
	1752	wall	Roman	over 1701	
	1753	ragstone wall	Roman	under 1719 over 1701	
	1754	ragstone wall	Roman	under 1719 over 1701	
	1755	ragstone wall	Roman	over 1701	
1015	1756	topsoil	modern	over 1757	
1015	1757	dumped layer	modern	under 1756 over 1758	
1015	1758	dumped layer	modern	under 1757 over 1759	
1015	1759	buried topsoil	modern	under 1758 over 1760	
1015	1760	colluvium	post-Roman	under 1759 over 1761	pottery, flint
1015	1761	colluvium	Holocene	under 1760	
1762	1762	topsoil	modern	over 1763,1764	
1019	1763	dumped layer	modern	under 1762 over 1764	
1019	1764	buried topsoil	modern	under 1763 over 1765	
1019	1765	colluvium	post-Roman	under 1764, over 1792, same as 1760, 1780, 1770, 1734	pottery, flint
1023	1766	topsoil	modern	over 1767	
1023	1767	dumped layer	modern	under 1766 over 1768	
1023	1768	dumped layer	modern	under 1767 over 1769	
1023	1769	buried topsoil	modern	under 1768 over 1770	
1023	1770	colluvium	post-Roman	under 1769 over 1771 same as 1780,1765,1734,1760	pottery, burnt flint, flint, BM
1023	1771	colluvium	post-Roman	under 1770, over 1831, same	pottery,worked flint,

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TR	CXT	TYPE	PERIOD	ASSOCIATION	FINDS
				as 1761,1735,1791,1792	burnt flint
1021	1772	buried topsoil	modern	under 1773 over 1774	
1021	1773	dumped layer	modern	over 1772	
1021	1774	dumped layer	modern	under 1772 over 1775	
1021	1775	dumped layer	modern	under 1774 over 1776	
1021	1776	dumped layer	modern	under 1775 over 1777	
1021	1777	dumped layer	modern	under 1776 over 1778	
1021	1778	dumped layer	modern	under 1777 over 1779	
1021	1779	buried topsoil	modern	under 1778 over 1780	
1021	1780	colluvium	?post-Roman	under 1779 over 1791	pottery, flint, burnt flint, building material
1026	1781	topsoil	modern	over 1782	
1026	1782	dumped layer	modern	under 1781 over 1783	
1026	1783	dumped layer	modern	under 1782 over 1784	
1026	1784	dumped layer	modern	under 1783 over 1785	
1026	1785	dumped layer	modern	under 1784 over 1786	
1026	1786	dumped layer	modern	under 1785 over 1787	
1026	1787	dumped layer	modern	under 1786 over 1788	
1026	1788	dumped layer	modern	under 1787 over 1789	
1026	1789	dumped layer	modern	under 1788	
1235	1790	finds retrieval			building material, pottery
1021	1791	colluvium	Holocene	under 1780	
1019	1792	colluvium	Holocene	under 1765, same as 1761,1735,1771,1791	
1025	1793	topsoil	modern	over 1794	
1025	1794	dumped layer	modern	under 1793 over 1795	
1025	1795	fill	modern	fo 1796 under 1794 over 1803	
1025	1796	pit	modern	cuts 1797,1798, filled by 1803,1795	
1025	1797	dumped layer	modern	under 1796 over 1798	
1025	1798	dumped layer	modern	under 1797, cut by 1796	
1024	1799	topsoil	modern	over 1800	
1024	1800	dumped layer	modern	under 1799 over 1801	
1024	1801	dumped layer	modern	under 1800 over 1802	
1024	1802	dumped layer	modern	under 1801	
1025	1803	fill	modern	fo 1796, under 1795, over 1796	
1237	1804	fill	Roman	fo 1806, under 1987	building material, bone, burnt flint, pottery
1237	1805	fill	Roman	fo 1846, under 1987	building materials, flint, burnt flint, pottery
1237	1806	ditch	Roman	cuts 1807,1805,1944, fb 1804,1845,1857,1863, under 1845	
1237	1807	?alluvium	Holocene	over 1944, under 1846, cut by 1846,1806	
1016	1808	colluvium	post-Roman	under 1735, over 1809	building material, pottery
1016	1809	colluvium	post-Roman	under 1808	building material, Cu alloy obj, pottery, flint, burnt flint
1275	1810	topsoil	modern	over 1811	
1235	1811	fill	modern	fo 1941, under 1810, over 1943	
1235	1812	colluvium		under 1941 over 1813	pottery
1235	1813	dumped layer	modern	under 1812, over 1814, cut by 1941	building material
1235	1814	midden layer	Roman	under 1813, over 1815	building material
1235	1815	midden layer	Roman	under 1814, over 1901, cut by 1941	building material
	1816	void	void	void	
1232	1817	topsoil	modern	over 1818	
1232	1818	dumped layer	modern	under 1817, over 1819	

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TR	CXT	TYPE	PERIOD	ASSOCIATION	FINDS
1238	1819	dumped layer	modern	under 1818 over 1820	
1232	1820	fill	?Pleistocene	fo 1855, under 1819, over 1852	
1238	1821	dumped layer	modern	under 1855 over 1856	
1014	1822	topsoil	modern	over 1823	
1014	1823	dumped layer	Roman	under 1822, over 1824	
1014	1824	dumped layer	Roman	under 1823, over 1825	building material
1014	1825	dumped layer	Roman	under 1824, over 1850	building material, Fe obj
1233	1826	topsoil	modern	over 1827	
1233	1827	dumped layer	modern	under 1826, over 1828	
1233	1828	dumped layer	modern	under 1827, over 1829	
1233	1829	dumped layer	modern	under 1828, over 1830	
1233	1830	cable housing	modern	under 1829	
1023	1831	colluvium		under 1771	burnt flint, flint
1236	1832	topsoil	modern	over 1833	
1236	1833	dumped layer	modern	under 1832, over 1834	
1236	1834	dumped layer	modern	under 1833, over 1835	
1236	1835	alluvium	post-Roman	under 1834, over 1836	building material, pottery, flint
1236	1836	alluvium	post-Roman	under 835, over 1837	building material, burnt flint
1236	1837	alluvium	post-Roman	under 1836	shell, building material, bone, burnt flint, pottery, flint
1230	1838	topsoil	modern	over 1839	
1230	1839	dumped layer	modern	under 1838, over 1840	
1230	1840	dumped layer	modern	under 1839, over 1841	
1230	1841	dumped layer	modern	under 1840	
1231	1842	topsoil	modern	over 1843	
1231	1844	coombe rock		under 1803	
1237	1845	fill	Roman	fo 1806, under 1804,	burnt flint
1237	1846	feature (form unknown)		cuts 1807, fb 1805, under 1805, cut by 1806	
1234	1847	topsoil	modern	over 1848	
1234	1848	colluvium	post-Roman	under 1847, over 1849	shell, building material, pottery, flint
1234	1849	colluvium	Holocene	under 1848	
1014	1850	dumped layer	Roman	under 1825, over 1851	shell, buildimg material, pottery
1014	1851	colluvium	Holocene	under 1850, over 1701	
1232	1852	fill	?Pleistocene	fo 1855, under 1820, over 1853	
1232	1853	fill	?Pleistocene	fo 1855, under 1852, over 1854	
1232	1854	fill	?Pleistocene	fo 1855, under 1853,	
1232	1855	hollow	?Pleistocene	cuts 1821,1856, fb 1820,1852,1853,1854	
1232	1856	chalk			
1237	1857	fill	Roman	fo 1806, under 1804, over 1963	
1238	1858	fill	Roman	fo 1885, under 1881, over 1924	building material, flint, bone, pottery, Fe nail
1238	1859	fill	Roman	fo 1885, under 1924, over 1964	pottery, bone, flint, building materials, Fe nail
1238	1860	fill	Roman	fo 1885, under 1965, over 1861	shell, building material, flint, metal obj, bone, pottery
1238	1861	fill	Roman	fo 1885, under 1860, over 1862	building material
1238	1862	fill	Roman	fo 1885, under 1861, over 1864	pottery, building material, flint, shell, Fe nail, bone
1238	1863	fill	Roman	fo 1890, under 1966, over 1886	building material, fllint, bone, pottery
1238	1864	fill	Roman	fo 1885, under 1862, over	

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TR	CXT	TYPE	PERIOD	ASSOCIATION	FINDS
				1882,1923	
1236	1865	dumped layer	Roman	under 1837, over 1866	
1236	1866	dumped layer	Roman	under 1865, over 1867	building material, bone
1236	1867	dumped layer	Roman	under 1866	
1236	1868	dumped layer	Roman	same as 1866	
1239	1869	topsoil	modern	over 1870	
1239	1870	dumped layer	modern	under 1869, over 1871	
1239	1871	dumped layer	modern	under 1870, over 1872	
1239	1872	dumped layer	modern	under 1871, over 1873	
1239	1873	dumped layer	modern	under 1872, over 1874	
1239	1874	layer	?Roman	under 1873, over 1875	building material
1239	1875	layer	?Roman	under 1874, over 1876	
1239	1876	layer	?Roman	under 1875, over 1877	
1239	1877	fill	?Roman	fo 1879, under 1876	building material, Fe nail
1239	1878	colluvium		cut by1879	
1239	1879	ditch	?Roman	cuts 1878, fb 1877	
1238	1880	topsoil	modern	over 1881	
1238	1881	topsoil	modern	under 1880, over 1858	
1238	1882	fill	Roman	fo 1885, under 1864, over 1883	
1238	1883	fill	Roman	fo 1885, under 1882, over 1884	
1238	1884	fill	Roman	fo 1885, under 1883,	pottery
1238	1885	ditch	Roman	cuts 1891, 1966, filled by 1858, 1862, 1964, 1965 1864, 1883, 1884, 1882, 1922, 1924, 1923	
1238	1886	fill	Roman	fo 1890, under 1863, over 1887	building material, flint, Fe nail
1238	1887	fill	Roman	fo 1890, under 1886, over 1967	
1238	1888	fill	Roman	fo 1890, under 1967, over 1890	
1238	1889	colluvium	Holocene	under 1897, over 1899, same as 1898, cut by 1890, 1885	
1238	1890	pit	Roman	cuts 1894, fb 1889, 1887, 1898, 1894, 1895	
1238	1891	fill	Roman	fo 1893, under 1885, over 1892	
1238	1892	fill	Roman	fo 1893, under 1891,	pottery
1238	1893	pit	Roman	cuts 1894, fb 1891,1892	
1238	1894	colluvium	Holocene	under 1890,1893, over 1895, cut by 1885,1893,1890	
1238	1895	colluvium	Holocene	under 1894, over 1896	
1238	1896	colluvium	Holocene	under 1895, over 1897	
1238	1897	colluvium	Holocene	under 1896, over 1898	
1238	1898	colluvium	Holocene	under 1897, over 1899, same as 1889	
1238	1899	chalk		under 1898	
1235	1901	fill	Roman	fo 1919, under 1815, over 1902	burnt flint
1235	1902	fill	Roman	fo 1919, under 1901, over 1903	building material, flint
1235	1903	fill	Roman	fo 1919, under 1902, over 1904,1905	building material, pottery
1235	1904	fill	Roman	fo 1919, under 1903, over 1906	
1235	1905	fill	Roman	fo 1919, under 1903, over 1906	
1235	1906	fill	Roman	fo 1919, under 1904, 1905, over 1907	building material
1235	1907	fill	Roman	fo 1919, over 1908, under 1906	building material
1235	1908	fill	Roman	fo 1919, under 1907, over 1909	pottery, building material
1235	1909	fill	Roman	fo 1919, under	shell, building material

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TR	CXT	TYPE	PERIOD	ASSOCIATION	FINDS
				1908,over1910,1911	
1235	1910	fill	Roman	fo 1919, under 1909, over 1917	shell, building material, pottery
1235	1911	fill	Roman	fo 1919, under 1901, over 1912	fired clay, shell , building material, pottery
1235	1912	fill	Roman	fo 1919, under 1911, over 1913	
1235	1913	fill	Roman	fo 1919, under 1912, over 1914	
1235	1914	fill	Roman	fo 1919, under 1913, over 1915	shell
1235	1915	fill	Roman	fo 1919, under 1914, over 1916	
1235	1916	fill	Roman	fo 1919, under 1915,	
1235	1917	fill	Roman	fo 1919, under 1910, over 1918	
1235	1918	fill	Roman	fo 1919, under 1917, over 1921	building material
1235	1919	pit	Roman	cuts 1920, fb 1901-1918, 1921,1940	
1235	1920	colluvium	Holocene	cut by 1919, under 1940	
1235	1921	fill	Roman	fo 1919, under 1918, over 1940	
1238	1922	fill	Roman	fo 1885, under 1923,	
1238	1923	fill	Roman	fo 1885, under 1864, over 1922	
1238	1924	fill	Roman	fo 1885, under 1858, over 1859	
1022	1925	topsoil	modern	over 1926	
1022	1926	dumped layer	modern	under 1925, over 1927	
1022	1927	dumped layer	modern	under 1926, over 1928	
1022	1928	dumped layer	modern	under 1927, over 1929	
1022	1929	dumped layer	modern	under 1928, over 1930,1931	
1022	1930	dumped layer		under 1929	
1022	1931	dumped layer	modern	under 1929, over 1932	
1022	1932	dumped layer	modern	under 1931	
1235	1933	finds retrieval			building material
1020	1934	topsoil	modern	over 1935	
1020	1935	dumped layer	modern	under 1934, over 1936	
1020	1936	buried topsoil	modern	under 1935, over 1937	
1020	1937	colluvium	post-Roman	under 1936, over 1938,same as 1765,1780,1760,1770	
1020	1938	colluvium	post-Roman	under 1937, over 1939	building material, flint, burnt flint, pottery
1020	1939	colluvium	Holocene	under 1938	
1235	1940	fill	Roman	under 1921, fo 1919	
1235	1941	pit	modern	cuts 1812	
1237	1942	burnt patch	?Roman	under 1743, over 1944	burnt flint
1235	1943	fill	modern	fo 1941, under 1811	
1237	1944	colluvium	Holocene	under 1807	
1016	1945	colluvium	Holocene		flint
1023	1946	colluvium	Holocene		
1240	1947	peat	Holocene		flint
1240	1948	sandy silt	Holocene		
1240	1949	peat	Neolithic		flint
s193	1950	bedrock	Pleistocene		
s193	1951	lower coombe rock	Pleistocene		
s193	1952	upper coombe rock	Pleistocene		
s193	1953	flint gravel	Pleistocene		
s193	1954	sand	Pleistocene		
s193	1955	sand	Pleistocene		
s193	1956	gravel	Pleistocene		
s193	1957	sand	Pleistocene		
s193	1958	sand	Pleistocene		
s193	1959	sediment	Pleistocene		

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TR	CXT	TYPE	PERIOD	ASSOCIATION	FINDS
s193	1960	sand	Pleistocene		flint
s193	1961	sand	Pleistocene		
s193	1962	silt	Pleistocene		
1237	1963	fill	Roman	fo 1806, under 1804, over 1845	flint, pottery
1238	1964	fill	Roman	fo 1885, under 1859, over 1965	pottery
1238	1965	fill	Roman	fo 1885, under 1964, over 1860	
1238	1966	fill	Roman	fo 1890, under 1885, over 1863	building material
1238	1967	fill	Roman	fo 1890, under 1887, over 1888	
s193	1969	layer	Pleistocene		
s193	1971	layer	Pleistocene		
s193	1972	layer	Pleistocene		
s193	1973	layer	Pleistocene		
1017	1974	topsoil	modern	over 1975,1985	
1017	1975	concrete platform	modern	under 1974,over 1984,1976	
1017	1976	concrete butts	modern	under 1975,over 1977	
1017	1977	rubble layer	modern	under 1976, over 1978,1986	
1017	1978	backfill	modern	fo 1979,under 1977	
1017	1979	construction cut	modern	cuts 1980,fb 1978	
1017	1980	dumped layer	modern	under 1979,1981, over 1982	
1017	1981	cable trench	modern	cuts 1980, fb 1986	
1017	1982	dumped layer	modern	under 1980	
1017	1983	dumped layer	modern	under 1982	
1017	1984	rubble	modern	under 1975	
1017	1985	dumped layer	modern	under 1974	
1017	1986	backfill	modern	fo 1981, under 1977	
1237	1987	alluvium	?post-Roman	under 1743,over 1857,1804	

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SECTION 2: STATEMENT OF IMPORTANCE

10 CONCLUSIONS

10.1 Summary of stratigraphical discoveries

10.1.1 Drawn sections are presented for 3 areas of the site (Figs. 16, 17, 18), i) Section 193, ii) Section 40 and iii) Section 3. These sections illustrate that nature of the Pleistocene stratigraphical sequences in the western part of the site. In addition to these sections, schematic profiles have been constructed using the borehole/test pit stratigraphical data integrated with the section drawings (Fig. 24). Profile A equates approximately with the CTRL alignment, and Profile B with part of the North Kent Line Connection. In order to illustrate the complexity of the stratigraphical sequences both profiles have been constructed to show differing lines at one end of each profile. The north-south profile is marked on Figure 2 as A-A and A-A'; the east-west profile is shown as B-B and B-B'.

10.1.2 The stratigraphical information used in the construction of the profiles has been simplified and summarized from the individual site/sample logs presented elsewhere in this report. In order to generate the profiles individual locations within a zone either side of the profile line have had to be drawn in to create the profile. The width of this zone varies along the route corridor and boreholes have been selected/rejected on the basis of local geomorphology, likely sub-surface geology and Dr Wenban-Smith's knowledge of the area.

North-South Profile A-A/A'

10.1.3 This profile begins at borehole location SA 1245 in the north of the study area and includes information from the area of geoarchaeological purposive borehole drilling (ARC 0018, 0019, 0020 and 0021 SA and test pits ARC 2006, 2005, 2018, 2064 TP). A single borehole from Kent County Council South Thameside Development Route 4 works is also included (ST 8). A major gap in data exists in the vicinity of the sports ground where only a single observation pit OP 1249 exists. Two alternative southern endings for the profile are provided that represent an easterly transect (SA 1952, AC 1902, ARC 1016 TP, AC 1900, Section 193 and OP 1255) and a westerly transect (SA 1252, OP 1254, AC 1901, ARC 1023/1232 TP, Section 40 and ARC 2020 TP).

10.1.4 At the extreme northern end of the transect borehole SA 1245 indicates that fill/made ground exists above chalk bedrock in this area. This part of the route corridor is a former quarry, presumably backfilled. The sediments sampled during the

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drilling for the evaluation indicate that a complex of sands and gravels exist between *c.*9.0 m and 0.0 m OD that appear to dip both down slope from west to east (0018 SA to 0016 SA) and southwards along the profile from 0018 SA to 0021 SA. In all cases these deposits overlay chalk rich sediments interpreted as soliflucted chalk. The contact between bedrock chalk and the overlying shattered and soliflucted chalk was difficult to locate in many cases where the transition appeared diffuse and gradational. In places the sands and gravels were overlain by a thin, c.1.0-1.5m, cover of clay-silt units interpreted as colluvial sediments.

10.1.5 The sands and gravels within this part of the transect are considered to represent sediments deposited under fluvial conditions in medium to high energy river systems. The sandy sediments in 0018 SA, 2006 TP and 2005 TP may be lateral, facies equivalents of the coarser gravel units in 0019 SA and 0020 SA. These deposits occur at lower elevations than those to the west in the vicinity of the 1970 British Museum excavation and may represent more recent depositional events (at this stage however lateral continuity with these higher sediments cannot be dismissed). The coarse sand and gravel units recovered in this study are thought to be of Pleistocene age.

10.1.6 Excavation of the Test-pits 2018 and 2064 TP indicates that the older Pleistocene sediments to the north have been cut and truncated by an erosion/deposition cycle in which sands containing a layer of burnt flints were deposited. These sediments appear to represent colluvial deposits probably originating from upslope and laid down in a small valley cut into the underlying Pleistocene sediments. These sediments are considered to be of Holocene date.

10.1.7 To the south the relationship between the Pleistocene/Holocene sediments and those recovered in 0021 SA remains unclear. The sediments present in this borehole indicate deposition in medium to high energy fluvial systems. Contained molluscs are of interglacial affinities. While no time-specific species are present in this assemblage it appears unlike known Holocene assemblages from the south of England. At present it appears that these sediments may be of interglacial character and may represent lateral facies variants of the Pleistocene sediments to the north or represent a more recent depositional event prior to the Holocene.

10.1.8 This suite of sediments has been shown to be complex and difficulties exist in correlating them with previous known sequences from the area. It is probable that a succession of

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climatic intervals are represented by the sequences from this area and that borehole 0021 SA may contain sediments from a more recent interglacial event than that recorded at higher elevations in the 1970 British Museum excavation.

10.1.9 Within the central part of the profile only one borehole and a single test pit was available for inspection. The borehole (ST8) has been taken from the valley base area to the east of the transect and at present it is not known how far to the west, and into the route corridor these deposits extend. This borehole (ST8) contains sands and silts with a variable organic content between datums of 2.28 m and -4.62 m OD overlying gravel units. These sediment types are typical of the Holocene valley bottom sediments recovered elsewhere in the valley and interpreted to have been laid down in wetland floodplain conditions. They overlie late Pleistocene gravels probably laid down in high energy river systems at the end of the last cold stage. Within the centre of the transect OP 1249 only shows 4.5 m of fill or made ground.

10.1.10 At the southern end of the route corridor the alternative transects illustrate the complexity of the Pleistocene Coombe Rock sequence and its relationship with probable colluvial sediments. Well established sequences of Pleistocene deposits exist in the vicinity of Sections 3, 40 and 193. These sequences indicate that the two coombe rock types, defined as the Lower and Upper Coombe Rock exist extensively throughout the area and can be seen in Sections 40 and 193 and 2020 TP. They may also have been seen in Trench 1232 TT. The complex nature of these sequences is illustrated in the eastern part of Section 193 where sediments similar in appearance to those described elsewhere as Upper Coombe Rock clearly underlie and overlie sand units (with a possible palaeosol). The sandy units have produced a freshwater mollusc fauna indicative of deposition in moving water. At present it is difficult to determine whether these deposits are of interglacial or interstadial character. The extent of solifluction sediments to the north appears greater within the area of the western profile than to the east. Chalk rich sediments, possibly of cold climate origin, can be traced through AC 1901 and into SA 1952. In the eastern profile these are restricted to CA 1900. These chalk rich sediments, where present, are overlain by a mixture of clay-silts, sands and gravels that may have a diverse origin. The sediments appear likely to be of colluvial origin but local fluvial activity within the profiles is suggested.

10.1.11 The southern end of the profile is therefore complex and contains a variety of sediment types laid down as a result of downslope

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movement of sediments under probable cold and temperate climatic conditions. The archaeologically significant Upper Coombe Rock sediments appear restricted to the spine of the spur extending from west to east. The slope deposits appear to interdigitate with fluvial sediments to the east and possibly to the north.

East-West Profile B-B/B'

10.1.12 This profile has been constructed at 90° to profile A-A/A' and forms a section cutting across the trend of the valley. The profile commences in the east adjacent to the railway and includes data from both this study, previous URL site investigations and work by KCC on STDR 4. Valley bottom locations used include ARC 1248 TT, RBC 920084, ST 1080, 1050, 1100, 1000, ARC 0022 SA, 1240 TP and 1013 TP. Two valley side profiles are presented, a southerly transect utilizing ARC 1013 TP, AC 1903, Section 193 (logged at 10m intervals), Section 185 and Section 40, and a northern profile using ARC 1013, 1016 TP, AC 1902, SA 1952, AC 1897, 1899 and Section 3.

10.1.13 The eastern part of this profile, within the valley bottom area consists of sediments dominated by peats and clay-silts deposited in wetland floodplain or abandoned channel situations. Borehole RBC 920084 records c.6m of peat and appears unlike any of the remaining boreholes within the area. This borehole, from historical sources, may have been logged erroneously or perhaps sediments containing any organic material have been described as peat. The organic units overlie sands to the west (e.g. ARC 0022 SA) indicative of higher energy fluvial situations. At the edge of the valley bottom coarse rubble deposits were recorded within the organic units that may represent construction debris. This test pit (ARC 1013 TP) is in a wetland marginal situation.

10.1.14 Sands and silts interpreted as colluvial sediments have been noted in locations on both parts of the transect to the west (ARC 1016 TP, AC 1902, SA 1952 and CA 1903). No direct stratigraphic relationship between these sediments and the wetland sediments to the east can be demonstrated and it is assumed that they either underlie or interdigitate with the wetland sediments.

10.1.15 On the southern profile the sections recorded between 10.0m and 4.0m O.D. (Section 193, 40) clearly illustrate the distribution of the two coombe rock deposits laid down under periglacial conditions. At the eastern end of section 193 the fluvial sediments that are interbedded with the Upper Coombe Rock were seen.

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10.1.16 To the north the Pleistocene sediments appear to be represented by sands (AC 1897, 1899) that overlie coombe rock in AC 1899. These observations accord with the presence of a channel sequence in Section 3.

10.2 Extent of archaeological deposits

Palaeolithic

10.2.1 A number of areas of potential Palaeolithic archaeology (Figs 3 and 25) within the Ebbsfleet Valley have been defined in the Historic and Cultural Effects Specialist Report (URL 1994) and these areas are referred to in the following sections. Section 3 is located in Area 3; Test-pits 2019 and 2020TP, and Section 40 are located in Area 5; Trench 1232TP, Test-pit 2063TT and Sections 185 and 193 are located in Area 6; and Boreholes 0016-0021 and Test-pits 2005, 2006, 2018 and 2064TP are located within Area 8.

10.2.2 Pleistocene deposits of Palaeolithic significance were located in Area 6 (Sections 185 and 193, Trench 1232) and Area 5 (Test-pits 2019 and 2020). Flint artefacts were recovered from within solifluction sediments at all these locations except Trench 1232.

Later prehistoric

10.2.3 Later prehistoric deposits of Neolithic date were found in Trench 1240 within the Holocene sedimentary sequence in the valley bottom, and of Bronze Age date in Test-pit 2018 at the north end of the site within a colluvial sequence, probably filling a dry valley. The overall extent of archaeological deposits within the Ebbsfleet Holocene sedimentary sequence is difficult to define with any level of accuracy due to the limited nature of the evaluation. However, *in situ* valley bottom sedimentary deposits with potential for later prehistoric archaeology were recorded throughout the Holocene valley of the Ebbsfleet, in Trenches 1006 - 1010, 1013, 1248, 1252, 1276 - 1278 and 1310.

10.2.4 Finds of later prehistoric struck flint flakes in secondary contexts were made in colluvial deposits in Trenches 1015, 1016, 1019, 1020, 1021, 1023, 1234 and 1309, and Test-pits 2005, 2018, 2022 and 2064; in alluvial deposits in Trenches 1236 and 1237; and from features of Roman date in Trenches 1235, 1238 and 1287. Of these, the flint from Trench 1020, recovered from a colluvial layer, includes probable Neolithic material in mint or fresh condition indicating that it may not have undergone a great deal of post-depositional disturbance. The flint from Trench 1238, recovered from Roman features, is mostly in mint condition suggesting that the features may have disturbed an *in*

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situ Neolithic horizon. Much of the remainder of the flintwork derives from colluvial deposits lining the valley sides and is largely Neolithic in character.

Roman

10.2.5 Archaeological deposits dating to the Roman period were found in Trenches 1013, 1235, 1237, and 1238 in the vicinity of the Northfleet villa. Cut features of probable Roman date were also recorded, but not investigated, in Trenches 1236 and 1239 also in the vicinity of the villa. Archaeological features of Roman date were also found some 250 m to the south in Trench 1287.

10.2.6 The present evaluation has successfully confirmed the exact location of the previously recorded Roman structural remains, and has demonstrated that the associated deposits extend some distance beyond the structures. Although no additional substantial stone-founded structures were located, this may be more a reflection of the limits of the current evaluation rather than evidence that no others exist.

Saxon

10.2.7 Saxon pottery was found in a number of trenches. The majority of the pottery was recovered from colluvial or alluvial deposits close to the Villa buildings.

10.2.8 Test pits 2020 and 2021 were located as close as possible to the Roman and Anglo-Saxon remains recorded in the edge of the Blue Lake quarry pit. The deposits recorded are similar to those visible in a cutting to the south, set back from the edge of the Blue Lake. These deposits are believed to be of recent, 20th century, origin (pers comm F Wenban-Smith).

10.3 Nature of the archaeological deposits

Palaeolithic deposits

10.3.1 The presence of chalk solifluction deposits containing Tertiary flints in Test-pits 2005 and 2006 TP in Area 8, suggests possible correlation with the Upper Coombe Rock recorded further to the south in Areas 5 and 6. However, this may be a function of the source of the Tertiary flints rather than an indication of contemporaneity between units. Reworked artefacts may be present within these units. The overlying solifluction deposit in Test-pit 2005 TP, and the overlying fluvial sands in 2006 TP, may contain redeposited artefacts. No Palaeolithic artefacts were actually recovered from the test-pits, and the nature of the sediments makes it unlikely that *in situ* material would be present. The nature of the sediments observed in these sequences also suggests that palaeoenvironmental potential is

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low. The solifluction sediments are of Pleistocene age. The upper, colluvial sediments, may be of Holocene age, though an earlier date for their deposition cannot be ruled out.

10.3.2 The classic Levalloisian site of Baker's Hole, excavated by RA Smith in 1909, was probably located in Area 6, close to Section 193 in the same Upper Coombe Rock deposit. Smith found prolific flint artefacts, some refitting, in association with fauna. Recent investigations of the same surviving deposits in Area 6 by F Wenban-Smith have recovered several artefacts from the Upper Coombe Rock, particularly at its base at the junction with the Lower Coombe Rock. The artefacts include a crude Levalloisian core, a blade from the surface of a Mousterian blade core and other unspecific debitage. Some artefacts are in very fresh condition. Although no macrofauna has been found, the calcareous nature of the deposits makes the potential for its preservation high. Calcareous silts rich in microfauna at the northern end of Section 193 have high potential for environmental reconstruction and dating.

10.3.3 The archaeological significance of the deposits recorded in Area 5 (Test-pits 2019 and 2020 TP and Section 40) depends on a correct correlation with the Upper and Lower Coombe Rock deposits recorded elsewhere in the area. If the upper solifluction deposits containing Tertiary flints are correctly correlated with the Upper Coombe Rock as suggested here, then the archaeological significance of these sediments is high. Furthermore mammalian remains are expected within these sediments.

10.3.4 The channel-fill deposits recorded in Section 3 (Area 3) have been shown to be rich in both Palaeolithic flint artefacts and faunal remains. They are a lateral equivalent of the deposits protected as a SAM about 20 m to the south (Kent 267b). Work at the SAM in the 1930s revealed horizons of *in situ* lithic artefacts within the channel fill sequence, although the bulk of the archaeological remains from the sequence are fluvially transported. The faunal remains are from the channel-fill deposits include both macro and micro fauna, the latter being particularly significant for dating purposes and environmental reconstruction.

Neolithic and Later Prehistoric deposits

10.3.5 The evaluation confirmed the presence of archaeological material within the sedimentary sequence filling the Holocene valley floor of the Ebbsfleet, in association with well-preserved environmental remains. In Trench 1240, several mint condition struck flint flakes were recovered from near the top of a very

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woody peat deposit at a depth of 3.6-3.7 m. The assemblage included a Neolithic convex scraper. Recent work in the valley (Barham & Bates 1995) also yielded flint artefacts at a similar depth close to the location of Trench 1285. Additionally previous work by Burchell and Sieveking has recorded important sequences of Prehistoric archaeology within the alluvium further up the valley. The observations from Trench 1240TP are probably a lateral equivalent of these occurrences. While the lower deposits recorded in Trench 1310 did not yield any artefactual material, they are similar to deposits recorded by both Burchell and Sieveking within the Scheduled Ancient Monument a short distance up-stream (Kent 268). Artefacts within the colluvial deposits are likely to be reworked (although see section 10.2.3 above).

Roman deposits

10.3.6 The Roman wall-footings within the trenches left open by TAG were recorded and it has been possible to relate them to the plan produced by Steadman in 1913. It has not been possible to examine the records made by the Thameside Archaeological Group, but the position of some of their excavation trenches has been plotted.

10.3.7 The buildings survive as flint and/or ragstone wall foundations but previous excavation has removed associated floor surfaces in those areas examined. Steadman describes floors of concrete as well as painted wall plaster surviving *in situ*.

10.3.8 Where exposed, the surviving walls are stratigraphically isolated as previous excavation has removed any associated archaeological deposits, but stratigraphic relationships between these walls and deposits are likely to survive in areas not disturbed by previous excavation. Archaeological deposits occasionally survive immediately beneath the wall-footings but, in general, the footings are cut into sterile colluvial deposits.

10.3.9 Cut features of Roman date survive to the north-east and east of the remains of the buildings. In Trench 1235, a pit was sealed beneath 1.4 m of later deposits. The origin of these deposits is uncertain: they are probably the result of deliberate dumping to raise the ground level in a low-lying area close to the Ebbsfleet. However, the date of deposition is uncertain and it is possible that they are associated with the original stripping of the site in the early part of this century and derive from the topsoil covering the buildings to the south. A build-up of similar deposits was recorded in Trench 1014.

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10.3.10 In Trench 1236, the edge of a linear feature was recorded orientated roughly parallel to the present course of the Ebbsfleet. It was sealed beneath a sequence of clay sands and silts, 2.2 m deep. The close proximity of the modern course of the Ebbsfleet suggests that the sequence was probably alluvial in origin. A similar sequence was present in Trench 1237, 35 m to the south-east and in Trench 1013. In Trench 1237 they sealed a number of archaeological deposits. Ditch *1806* was orientated from east to west, and may have been a boundary ditch delimiting the northern extent of the settlement. It truncated fill *1805* containing frequent burnt flints including several struck flakes.

10.3.11 A series of pits was excavated in Trench 1238, immediately to the east of the buildings recorded by Steadman, and produced some domestic waste. A large rubbish pit was also excavated in this area by the Thameside Archaeological Group.

10.3.12 Trench 1239 was located on a raised platform. Excavation has demonstrated that the platform consists of re-deposited material. The deposits contain a high percentage of chalky inclusions and may derive from quarrying in the early part of this century. If this is the case, then it may represent chalk waste from the original Baker's Hole site. One edge of a linear feature was recorded beneath the re-deposited levels indicating that archaeological deposits have been protected from later disturbance and excavation in this area.

10.3.13 In Trench 1013 frequent blocks of flint and other, non-local, stone, and fragments of Roman tile were found within a sequence of silts and organic silts between depths of 1.90 m and 3.0 m below the ground surface. At the base of the trench a possible upright stake was observed but could not be further investigated due to the unstable nature of the trench sides.

10.3.14 To the south of the villa site, in Trench 1287, two ditches (*598* and *620*) were sealed beneath colluvial layer *594* and cut an earlier colluvial layer. The fills of both these ditches were similar to the surrounding colluvial deposits and are probably also of colluvial origin. Fill *595* yielded a single sherd of pottery of probable 1st- to 2nd-century date, as well as Roman tile. Fill *619* from Ditch *620* produced a sherd of pottery not diagnostic as to date but possibly prehistoric. The paucity of cultural material within these features suggests that they do not lie close to a focus of settlement and may represent field boundaries associated with the Northfleet Villa.

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10.3.15 To the south of Trench 1287, along the route of a station access road, a considerable depth of made ground was present. However, the deposits recorded in Trench 1290 suggest that undisturbed deposits survive at a depth of 2.5 m below the ground surface. The later deposits appear to form a bank running parallel to the Ebbsfleet and probably associated with quarrying in the back-filled pit to the west. It is possible, therefore, that archaeological deposits survive beneath the made ground.

10.4 Character of the site

10.4.1 On the basis of the information examined during the course of study the Ebbsfleet study area can be divided into five main zones of interest:

1. A northern area (Area 8) consisting of the site area within the vicinity of the boreholes and Test-pits ARC 2005, 2006, 2018 and 2064 TP

2. The vicinity of the Sports Ground, including Area 3

3. A central area (Areas 5 and 6) in the vicinity of the Roman Villa and the old wash mills to the south of the tennis courts

4. The valley bottom area

5. The Roman Villa site.

10.4.2 These areas have been defined on the basis of the available information, similarities in geologies and the nature of the expected archaeology.

The northern area

10.4.3 This area consists of a sequence of Pleistocene sands and gravels overlying chalk rich sediments interpreted as solifluction sediments. The relationship between the solifluction deposits and the solifluction deposits of the 'classic' Upper and Lower Coombe Rock sediments to the south is unknown. The sands and gravels recorded in the boreholes have been interpreted as indicative of deposition within a fluvial environment. Molluscan evidence from borehole ARC 0021 SA indicates that these sands were deposited under fully temperate, interglacial conditions.

10.4.4 The sediments form a wedge of deposits lying on a slope and from the data obtained to date it is unclear whether these deposits belong to a single depositional episode or may represent sediments laid down during successive depositional events

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during the Pleistocene. In particular it is difficult to determine the relationship between borehole ARC 0021 SA and the sediments recovered in the boreholes to the north.

10.4.5 This sequence of sediments lay downslope from the sequences excavated by the British Museum in the 1970's and recorded recently by Wenban-Smith (1996). At present it is unclear whether lateral continuity exists between these deposits and those within the CTRL corridor.

10.4.6 No archaeological material was recovered from the sediments in the boreholes. Faunal material (molluscs but no bone) was recovered from borehole ARC 0021 SA.

10.4.7 The Pleistocene sediments appear to have been truncated but a sequence of probable Holocene colluvial deposits has been recorded in test pits ARC 2018/2064 TP. These deposits appear to be bedded downslope. Archaeological material of Neolithic and Late Bronze Age date was recovered within the colluvial deposits and a thick layer of burnt flint was recovered from ARC 2018 TP.

The sports ground area

10.4.8 Little information is available for this area. A single borehole (ST8) drilled as part of the STDR works has been used to illustrate the nature of the Holocene sediments within the valley bottom area adjacent to the CTRL corridor (Figure 15). The location of the edge of valley bottom deposits is unknown and may intrude into the central area. A single test pit was excavated in the sports ground area (OP 1249) that recorded in excess of 4m of made ground.

10.4.9 Pleistocene sediments to the west of the Sports Ground have been recorded (Section 3) that have been traced beneath parts of the fields behind the Sports Pavilion (Wenban-Smith pers. comm.). It remains unclear how far these deposits extend to the east and whether quarrying or extensive backfilling has taken place within this area.

10.4.10 The Sports Ground itself remains largely unknown and potentially contains Pleistocene and Holocene valley bottom sediments. Holocene edge marginal situations, thought to represent favored locations for human activity, may exist in the area.

The central area

10.4.11 This area represents the zone exhibiting the greatest stratigraphical complexity within the area of the CTRL. The

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nature of the stratigraphy is illustrated in Figures 15, 16 and 17. Soliflucition sediments, correlated with the 'classic' Upper and Lower Coombe Rock were noted in a number of test pits and open sections (Test-pits 2019 and 2020TP, and Section 40 in Area 5, and Trench 1232TT, and Section 185 and 193 in Area 6). At the southern end of Section 193 fine grained sands, containing a potential palaeosol, were noted interdigitating with sediments lithologically similar to the Upper Coombe Rock. These deposits were only preserved as a very narrow strip of sediments running east/west along the former quarry side, having been eroded away to the north by an early channel represented by deposits seen in Test-pit 2063TP, and having been destroyed to the south by the Baker's Hole quarry itself. They are considered to represent a narrow remnant of the sediments associated with Smith's Bakers Hole site. The sediments are overlain by fine silts and sands of possible colluvial origin. These deposits can be seen to dip and thicken downslope away from the solifluction sediments and probably disappear below the Holocene alluvial sequence (although this remains to be demonstrated). Elements of the colluvial sequence may contain sediments of fluvial origin.

The valley bottom area

10.4.12 The valley bottom area contains a sequence of unconsolidated, organic rich sediments overlying sands and gravels of late Pleistocene or early Holocene age. The evidence suggests that two main peat units occur within the up-stream area of the valley (ARC 0022 SA). These units are interbedded with organic silts. Down the valley these sediments become less organic and become inorganic blue-grey clay-silts. No true edge marginal sequences were observed in this field study but near edge sequences may have been recorded in ARC 1013 TP. Archaeological material was recovered in ARC 1240 TP in the up-stream area at a depth of *c*3.6-3.7m. The assessment of soil samples taken from these deposits (Appendix 10) suggests that the damp alder woodland predominated at least until the Neolithic period. This had given way to open reed swamp with some grassland by the Roman period. A sample from Trench 1276 TT also contained a maritime element, indicating that salt-marsh was present in the valley.

The Roman Villa site

10.4.13 It has been suggested that the building complex at Northfleet represents an industrial site rather than a villa (Smith 1932). However, Detsicas (1983) considers the site to have been a villa, and many of the characteristics generally associated with villas, such as a bath-house, mosaics and hypocaust systems, are present at Northfleet. Steadman records the survival of concrete

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floors, *in situ* painted wall plaster and a hypocaust system in eastern part of the main building complex. During the 1970s and 1980s, the Thameside Archaeological Group re-excavated much of the area. As well as re-locating the main elements described by Steadman, the group also excavated a previously unknown bath-house a short distance to the north of the main group of buildings. The bath-house consisted of a hypocausted *caldarium* and *tepidarium* and a *frigidarium* - the *frigidarium* was paved with a mosaic, some of which survived *in situ*. While there is certainly evidence that the site had an industrial component, eg. a lime-kiln was excavated adjacent to the main building complex, there is no reason at present to suggest that this was its primary function.

10.4.14 The evaluation has demonstrated that archaeological deposits exist at considerable depth close to the Ebbsfleet. Alluvial deposits were present in Trenches 1013, 1236 and 1237, overlying archaeological deposits of Roman date. The lower deposits in Trench 1013 may have been the result of deliberate dumping during the Roman period, to the raise the ground surface in an area of wetland.

10.5 Environmental evidence

10.5.1 Limited molluscan remains were retrieved from samples taken from Pleistocene deposits in both the northern and the central areas (Appendix 12). No small mammal bones were recovered.

10.5.2 Samples taken from waterlogged deposits within the valley bottom have produced useful information regarding the development of the Holocene environment (Appendix 10). The samples from the lower deposits (below 3m, and from Trench 1310 on the margins of the valley bottom deposits, are indicative of damp alder woodland. In Trench 1240, the environmental evidence is assosiation with C-14 date Beta - 105972 suggests that these conditions were present at least until the Neolithic period.

10.5.3 Samples from the upper waterlogged deposits (above 3m) are indicative of a wet reed swamp environment with some grassland. In Trench 1276 a maritime element was also present in sample 6, indicating the presence of salt-marsh. This sample also contained charred glume bases of *Triticum spelta* (spelt wheat), suggesting an Iron Age or Roman date for the deposit.

10.5.4 Samples for the assessment of charred plant remains were taken from a number of deposits, largely associated with the Roman villa (Appendix 10). These demonstrated that preservation was

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generally good with a large number of identifiable cereal grains. In addition, the large quantity of chaff from many of the samples suggests that substantial crop processing took place on the site.

10.5.5 Four samples which had been processed for charred plant remains were also assessed for molluscs (Appendix 11). Two of them (Sample 27 from Context *1940* and Sample 37 from Context *1963*) did not contain molluscs. Samples 61 and 62 (from contexts *619* and *597* respectively) were from two ditches in Trench 1287. Both contained sufficient concentrations of molluscs to allow palaeoenvironmental interpretation.

10.5.6 The majority of the small assemblage of animal bone was collected from Roman features (Appendix 9). In general, the condition of the bone was good, with 47% of it being identifiable to species.

11 IMPORTANCE OF THE ARCHAEOLOGICAL REMAINS

11.1 General

One means of determining the importance of archaeological remains in Britain is by reference to the Secretary of State's non-statutory criteria for the scheduling of Ancient Monuments (eg as set out in Darvill 1987). The following section summarises these for each of the main period deposits within the Ebbsfleet valley.

11.2 Survival/condition

General

11.2.1 The Ebbsfleet Valley has been exploited for its underlying chalk deposits throughout this century, with the result that large areas have been destroyed. In contrast, in much of the area not directly affected by quarrying, the ground level has been raised by dumping of quarry and other waste. The result of this is that the original ground surface has been deeply buried, thereby protecting it from further disturbance, but making assessments of the surviving deposits difficult.

Palaeolithic

11.2.2 In the northern area (Area 8), the deposit appears to be undisturbed natural sediment and no evidence of quarrying or substantial areas of fill were noted. In places biological material (molluscs) is preserved but preservation is intermitently present. Archaeological material was not recovered from the Pleistocene sediments but if present would not have been *in situ*.

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11.2.3 In the central area (Areas 5 and 6) the majority of the Pleistocene sediments within the area have been removed by quarrying, leaving only a narrow spine of undisturbed sediments in Area 5 (*c.* 20m wide) and more extensive deposits in Area 6. A narrow spine of fine sediments including a possible palaeosol, which contain Palaeolithic artefacts survives along the west side of the wash mill quarry (probably the original Baker's Hole). In places biological material (molluscs and fauna) are preserved but are only intermitently present. Archaeological material was recovered from the solifluction sediments. Colluvial sediments overlying the Pleistocene deposits in Area 6 dip and thicken to the north.

Later Prehistoric Remains

11.2.4 Archaeological deposits of prehistoric date survive in association with the sedimentary colluvial and alluvial sequences in the Holocene valley of the Ebbsfleet. In a large part of the evaluation area, these sediments are buried beneath 20th century industrial and quarry waste so that material of Neolithic and later prehistoric date tends to be fairly deeply buried. No specific settlement sites or monuments have been identified but the freshness of the identified artefact clusters and associations with burnt flint suggest *in situ* domestic such as in ARC TT 1240 or other activity in the immediate area such as in ARC TT 1020. Within the Holocene deposits, reworked lithics were present in the colluvium.

Roman Remains

11.2.5 The stone wall-footings of the main building complex of the Northfleet villa still survive to a large extent, although previous excavation has removed them in places. The southern building, partly excavated by Steadman and re-excavated by the Thameside Archaeological Group, has probably been largely destroyed by quarrying and subsequent excavation. The condition of the bath-house, at least partly excavated by the Thameside Archaeological Group, is not known. Floors and occupation debris associated with the buildings appear to have been removed by excavation in those areas investigated during the present study, but may survive in limited areas not disturbed by previous excavation.

11.2.6 In areas peripheral to the stone footings of the buildings, cut features contemporary with the use of the buildings are well-preserved. Preservation is enhanced in places by the depth of burial of the archaeological remains, both beneath alluvial deposits close to the course of the Ebbsfleet, and beneath

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quarrying waste immediately to the west of the building complex.

11.2.7 Cultural remains are present, though generally in small quantities. The finds consist mainly of roof tile, in fairly large quantities, and pottery. Other finds are limited, consisting of quernstone fragments, occasional iron copper alloy objects, and fired clay. During the original excavation of the site 'several cwts' of pottery and five coins were found (Steadman 1913).

Palaeoenvironmental remains

11.2.8 Groundwater pumping associated with quarrying and other activities has significantly lowered the watertable throughout the Ebbsfleet Valley. This may have caused deterioration of organic material within the valley bottom. However, perched watertables exist locally within the valley resulting in a lesser degree of desiccation than might have been expected and the deeper peats on the valley floor, which include prehistoric flintwork, have excellent preservation. In addition, archaeological remains are preserved within colluvial deposits on the edge of the valley, for example in Test-pit 2018.

11.3 Period

Palaeolithic

11.3.1 In the northern area the age of the Pleistocene sequence is uncertain.

11.3.2 No data was available for the sports ground area.

11.3.3 The Pleistocene sediments in the central area were probably deposited during Oxygen Isotope Stages 6 - 8 but this remains to be verified.

Neolithic and Later Prehistoric

11.3.4 The colluvial deposits in the central area produced flint artefacts of Neolithic character, some in good condition. The colluvial sediments in the northern area produced pottery of Late Bronze Age date and flints of Neolithic character. The lithic artefacts in the valley bottom indicate a Neolithic age for parts of the sequence as indicated by the C-14 date (Beta 105972) of 2910 Cal BC from ARC 1240 TT (Appendix 14).

Roman

11.3.5 No direct evidence for a pre-Roman Iron Age phase of occupation was found in the area of the Northfleet villa, although late Iron Age pottery was found in association with Roman pottery. A pre-Roman phase was inferred during the original excavation of

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the site on the basis of a deposit of black peaty soil found beneath the foundations in places. However, it is not reported where the deposit yielding artefacts was located and it may relate to an earlier Roman phase of occupation.

11.3.6 The limited artefactual evidence from the present evaluation suggests that the site was occupied throughout the Roman period.

Anglo-Saxon

11.3.7 No direct evidence of Anglo-Saxon occupation was found on the villa site or elsewhere within the evaluation area. However, sherds of Saxon pottery were recovered from the area around the villa from alluvial and colluvial deposits. This may indicate that occupation continued into the Saxon period although the nature of the deposits makes this uncertain.

Palaeoenvironmental deposits

11.3.8 Significant palaeoenvironmental deposits of Pleistocene date have been recorded in Areas 3, 5, 6 and 8.

11.3.9 Palaeoenvironmental remains are preserved within the Holocene alluvial sequence in the valley bottom. The sequence is largely undated but is likely to span the Holocene period.

11.3.10 Palaeoenvironmental remains are preserved within cut features of Roman date.

11.4 Rarity

Palaeolithic

11.4.1 Pleistocene sediments of fluvial origin as recorded in the northern area (Area 8) are common in southern England. Solifluction deposits containing Palaeolithic material as recorded in Areas 5 and 6 are rare. *In situ* palaeosols, as recorded at the northern end of Section 193 are very rare.

Later Prehistoric

11.4.2 Colluvium containing transported Neolithic artefacts is common in SE England

Roman

11.4.4 A total of 38 sites described as villas are known from Kent. Most of the excavations carried out on these sites took place in the nineteenth and early twentieth centuries and were inadequately excavated and recorded. Indeed of the roughly 20 sites which have been investigated, only eight have been published since 1950 (Champion and Overy 1989, 44). Although the major

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buildings at Northfleet have been heavily disturbed by quarrying and earlier archaeological investigations, this is the area which most previous work has concentrated on.

11.4.5 There is very little evidence for the production of lime in Kent but, as Champion and Overy observe, 'this industry, necessary for building and wall plastering, must have been on a very large scale' (Champion and Overey 1989). For this reason the presence of a lime kiln at Northfleet, as recorded by Steadman, is important.

11.5 Fragility/vulnerability

11.5.1 In the northern area there is no significant modern overburden overlying the Pleistocene and Holocene sequences. However, significant archaeological horizons, such as the burnt flint deposit in ARC 2018 TP, may be buried beneath later deposits of colluvium of little archaeological importance.

11.5.2 Little information is available regarding depth of burial Pleistocene and Holocene deposits in the sports ground area.

11.5.3 In the central area, the surviving remnants of the Pleistocene sequence and the Roman site are extremely vulnerable and likely to be significantly effected by any de-vegetation and construction activity in the area. The colluvial sediments, of greater extent, are less vulnerable to construction activity.

11.5.4 To the south, in the vicinity of Trenches 1287-1309TT, the colluvial deposits are deeply buried beneath recent dumped material except close to Trench 1287. Here, modern overburden is relatively shallow and construction work may affect archaeological deposits.

11.5.5 In the valley bottom, the preservation of organic material is vulnerable to dewatering, and loss of organic content within the sediment may lead to distortion of the sediment bodies and primary associations between artefacts. In addition, if piling activity is associated with the river crossings of both the CTRL itself and the connecting line to the North Kent line, this would impact directly on levels of archaeological potential.

11.6 Diversity

11.6.1 The Pleistocene deposits incorporate a variety of depositional environments and ancient topographical features no longer visible on the surface. In places there is a good range of other (biological) palaeoenvironmental evidence.

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11.6.2 The Holocene valley bottom deposits also include a variety of depositional environments and ancient topographical features with a good range of other palaeoenvironmental evidence.

11.6.3 The evaluation has demonstrated that, apart from the Villa buildings themselves, a range of features of Roman date are present.

11.7 Documentation

11.7.1 The Pleistocene deposits in the central area were investigated in the early 20th century by RA Smith and others who excavated a rich Levalloisian assemblage in the vicinity of the surviving deposits. This site is Britain's best, most documented and richest Levalloisian site.

11.7.2 Some work on Neolithic deposits in the valley bottom, undertaken during the 1930's by Burchell, has been published. Later work by Sieveking remains to be published.

11.7.3 Two previous excavations of the Villa have been carried out. A brief report of the 1909-11 excavations was privately published (Steadman 1913). Of the Thameside Archaeological Group's excavations, short reports have appeared in the Kent Archaeological Review but no other material has been published. It has not been possible to obtain any records of the excavation and the location of the primary archive is uncertain.

11.7.4 Recent work undertaken for KCC on the Holocene sedimentary deposits in the valley bottom has been published (Barham and Bates 1995).

11.8 Group value

11.8.1 The Pleistocene deposits have significant group value because of their key position in relation to other deposits within the Ebbsfleet Valley and the lower Thames.

11.8.2 The Neolithic and later prehistoric archaeology is of considerable importance within the valley since the Ebbsfleet ware type site for the British Neolithic is defined here

11.8.3 The Roman villa at Northfleet is one of a series in West Kent lying predominantly in river valleys and along the foot of the Downs. The site has value in terms of the distribution of these rural settlements and additional value because of its close proximity to Springhead Roman town.

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11.9 Potential

11.9.1 The Pleistocene deposits in Areas 5 and 6 may have significant archaeological potential for i) recovering a properly excavated sample from Smith's Levallosian site, and ii) directly dating the site using amino acid geochronology, mammalian biostratigraphy and radiometric dating techniques.

11.9.2 The discovery of artefacts in Area 6 within a sequence close to the site of the Baker's Hole discovery indicates that considerable potential exists for the recovery of further artefacts and information that may provide age estimates and palaeoenvironmental reconstructions. The deposits recorded in Section 193 seem to be the only surviving continuation of RA Smith's Baker's Hole Levalloisian site. Furthermore, calcareous silts with a microfauna with dating potential were found as part of the sequence.

11.9.3 If the Pleistocene deposits recorded in Area 3 (Section 3) extend into the sportsground area, they may contain significant archaeological and palaeoenvironmental remains. However, the extent at quarrying in this area is still poorly understood and the degree of preservation of *in situ* deposits is uncertain.

11.9.4 The Pleistocene deposits in Areas 3, 5, 6 and 8 have the potential to clarify the Pleistocene dating and climatic oscillations within the valley by means of amino acid geochronology, mammalian biostratigraphy, radiometric dating techniques and by direct geological relationships of the various deposits. They should also contain the transition from the Pleistocene valley side deposits to the Holocene valley bottom deposits, and contain the potential for minimally transported lithic artefacts to be in association with faunal remains.

11.9.5 The valley bottom deposits retain the potential for providing evidence for *in situ* Neolithic and later prehistoric occupation/ activity across the Ebbsfleet valley. The organic preservation indicates that rarer classes of material artefacts, such as wooden tools, may occur. Additionally the palaeoenvironmental record is likely to be well preserved and economic data may be recovered from the floral and faunal remains.

11.9.6 The evidence from this evaluation suggests the presence of undisturbed wetland Neolithic deposits within the valley bottom, with organic preservation in association with artefactual material; extensive deposits of this type have not often been investigated in Southern England, except in the East Anglian

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Fens and Somerset Levels. Recent work in the Lower Thames Valley suggests that such sequences may be commoner than is reflected in published literature.

11.9.7 For the Roman period, there is considerable potential for providing evidence of a range of activities including activities of an industrial nature associated with the villa estate. This is particularly true of the environmental and economic potential indicated by the well-preserved charred plant remains. As with the prehistoric deposits, the organic preservation indicates that rarer classes of material artefacts may occur within the valley bottom deposits close to the villa site. In particular, waterlogged remains of the Roman period may survive close to the Ebbsfleet, as indicated by the presence of a possible upright timber in Trench 1013. Of particular note is the long sequence of occupation, from 1st-century Iron Age to Late 4th-century. As long as sufficient deposits survive intact, this provides considerable potential for tracking the changing social, economic and environmental characteristics of the villa and its estate.

11.9.8 The survival of charred plant remains in stratified deposits, the possibility of the preservation of waterlogged organic remains, and the presence of industrial features, increases the potential to add to the understanding of the economic base of a villa estate. At Northfleet, this is particularly important in relation to the nearby Roman town at Springhead.

11.9.9 Undisturbed deposits of Saxon date could be present in the vicinity of the Villa although Saxon material was only recorded in secondary contexts during the present study.

11.10 Overall assessment

General

11.10.1 The main areas of quarrying and made ground (as presently known), surviving colluvial and alluvial deposits and main areas of archaeological potential are presented on Figure 25. A transparent overlay to this figure shows the locations of the archaeological works undertaken as part of this evaluation exercise, together with the main earthworks for the CTRL route passing through the Ebbsfleet valley, the connection to the North Kent Line and the main station access road along the west side of the Ebbsfleet valley. It should be noted that most of the boundaries are indicative only, owing to the limitations of interpreting the available data.

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11.10.2 Figure 24 is a composite long section, which approximates to the longitudinal CTRL alignment from the area of Bamber Pit to the north, to a point south of the sports ground and pavilion. The proposed rail track level (as currently known) has been added to this long section to demonstrate the likely impact of the works in broad terms on the recorded archaeological deposits. The section (apart from the rail track level which has been provided by URL direct) has been compiled from various sources of data, including historical borehole logs (ie. pre URL), URL boreholes and geotechnical pits, geotechnical observations along the line of STDR 4 undertaken by GSF for KCC and the results of the present evaluation. It must be stressed that the quality of geoarchaeological interpretation from the different sources is variable and that some of the locations are outside of the CTRL route, making direct comparison with the proposed rail track level of indicative use only.

Palaeolithic

11.10.3 The Pleistocene deposits and areas of Palaeolithic potential are divided into numbered areas based on those in the CTRL Assessment of Historic and Cultural Effects (URL 1994 fig. B6) and also shown on Figure 3 of this report. In general terms the recent evaluation has not significantly altered the projected extent of the various Pleistocene deposits. It has, however, in some cases generated a more informed reassessment of their Palaeolithic potential.

11.10.4 Areas 1, 2 and 4 (and Areas 7, 9, 11 and 12 which do not fall within the area of Figure 25) lie outside of the current evaluation area and the assessment of their potential in the CTRL Assessment of Historic and Cultural Effects (URL 1994 fig. B6) remains unchanged.

11.10.5 Area 3, which is part of the SSSI and is considered to be a nationally important site of limited extent, was only investigated by means of the recording of the upstanding west facing section (Section 3). This work was undertaken by Dr F Wenban-Smith prior to the current evaluation and the overall assessment of the significance of Area 3 (URL 1994) remains unchanged. This area lies to the west of and outside of the CTRL route.

11.10.6 Area 5, a narrow strip of surviving Pleistocene deposits between quarries, was considered (URL 1994) to be a nationally significant site of less limited extent. The two test pits (ARC 2019 TP and 2020 TP), only produced a single Palaeolithic artefact and no faunal remains, although previous work by Francis Wenban-Smith has produced large mammalian remains. However, based on a correlation of the Coombe Rock deposits, particularly with

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those in Area 6, the archaeological significance of the sediments remains high, but not as high as those in Area 6. The eastern end of this area will be affected by the CTRL route where the track level is in cutting.

11.10.7 Area 6, a more extensive area of the same deposit as Area 5, was initially considered (URL 1994) to be one of the most significant parts of the Pleistocene deposits surviving in the Ebbsfleet valley. The current evaluation has confirmed this assessment, indicating that Smith's Baker's Hole site was probably located very close to this area. Furthermore it has demonstrated that significant potential remains for the recovery of Palaeolithic artefacts and for palaeoenvironmental reconstruction and dating. The Pleistocene deposits containing the *in situ* palaeosol, recorded at the north-east end of Section 193, are of national significance and may be vulnerable to disturbance. The south-eastern and south-western limits of this deposit are clearly defined by the limits of quarrying. With the Pleistocene deposit dipping towards the north-west, it has not been possible in the current evaluation to determine precisely the north-eastern and north-western limits of this deposit. In general terms it is likely that the greatest interest, and deposits of high potential closest to the surface are represented by the southern portion of the area including the quarry face. Most of this deposit as currently defined falls within the apex between the route of the CTRL and the connecting spur to the North Kent line.

11.10.8 Area 8, although previously uninvestigated, was considered to be of high Palaeolithic potential due to its proximity to the Scheduled Monument (Kent 267a) Area 1. The boreholes and machine-excavated test pits undertaken as part of the current evaluation failed to produce any Palaeolithic artefacts or mammalian faunal remains. The mollusca in borehole ARC 0021 SA are difficult to relate to the Pleistocene solifluction sediments. Moreover, the Pleistocene sediments appear to have been partially truncated by a sequence of probable Holocene colluvial deposits (see below). It is also possible that the elevation of the Pleistocene deposits suggests that they are of more recent date (ie. later middle Pleistocene), and are therefore less likely to contain *in situ* Palaeolithic artefacts. While the evaluation of this area has confirmed that the deposits in Area 8 are generally undisturbed, the lack of any archaeological or faunal remains makes any reassessment of its potential mainly negative in character. This area falls within the main CTRL route to the north of the proposed station location. The proposed rail track level in this area is mainly either at grade or on embankment, with a slight cutting at the northern end.

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Alluvial Deposits

11.10.9 While the overall extent of the often deeply stratified alluvial deposits are reasonably well understood and mapped, no true edge marginal sequences were located during the evaluation. In the lower part of the valley the alluvial deposits have been buried beneath varying depths of made ground, often up to or over 2m deep. In general the valley bottom contains a sequence of unconsolidated organic rich sediments overlying sands and gravels of late Pleistocene or early Holocene date. Where it was possible to examine the deposits in detail such as Borehole ARC 2022 SA and Trench ARC 1240 TT, two main peat units were identified, similar to those published by Burchell and Piggott (1939), interbedded with organic silts. Neolithic flint was found in the peat units and a Carbon 14 date of 2910 cal BC, from the top of the lower peat unit both confirms the age of the deposits and suggests that earlier Neolithic material, more contemporary with Ebbsfleet ware, may be found lower down within this unit. The location of Trench ARC 1240 TT is some 400m north of the most northerly of the scheduled areas based on Burchell and Sievking's excavations. However, in Burchell's joint paper with Piggott in 1939 there is reference to undisturbed lithic material from a 12ft deep section at the junction of Brook Vale and the Ebbsfleet a quarter of a mile downstream from the site of his main excavation. The lower part of this section was dated by Burchell to the Neolithic and early Bronze Age. Although the exact location is open to interpretation it may have been very close to Trench ARC 1240 TT (F Wenban-Smith pers. comm.).

11.10.10 The evaluation also demonstrated that Roman archaeological deposits exist at considerable depth close to the Ebbsfleet. Alluvial deposits were present in Trenches ARC 1013, 1236 and 1237 TT overlying archaeological deposits of Roman date

11.10.11 The current evaluation has confirmed that Neolithic deposits, recorded within the alluvial sequence in the valley bottom, are likely to be of national significance, and could potentially contain evidence for *in situ* activity. Furthermore, the excellent organic preservation indicates that rare classes of artefacts may occur. The palaeoenvironmental record is also likely to be well preserved and economic data may be recovered from the floral and faunal remains. The presence of waterlogged Roman remains is also very likely where the buildings lie close to the Ebbsfleet, further enhancing the importance of this Roman site.

11.10.12 Towards the upper end of the Ebbsfleet valley, where the CTRL will cross the alluvial deposit, associated bridgeworks will affect the alluvial deposits between the two Neolithic Scheduled Ancient Monuments. Further north the alluvial deposits are mainly

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affected by the connection to the North Kent Line, which is mainly on embankment, This together with the depth of burial by modern overburden makes them less vulnerable to disturbance. However, bridging structures associated with another crossing of the Ebbsfleet and the CTRL will also affect alluvial deposits. The connection of the station access road to STDR 4 will also overlay alluvial deposits.

Colluvial Deposits

11.10.13 The extent of the colluvial deposits in the Ebbsfleet valley are imprecisely understood. No such deposits have been identified within the evaluation area to the east of the present course of the Ebbsfleet river. The deposits to the west of the Ebbsfleet survive as a linear band between quarrying to the west and the alluvial deposits to the east. The location of the interface between colluvial and alluvial deposits has been indicated on Figure 25 and this marginal land would have been prime areas for prehistoric and later activity. It is likely that there are complex interdigitated deposits of colluvium and alluvium in this zone. The northerly extent of colluvial deposits to the west of the sports pavilion is especially uncertain (but see mixed cut and fill below). The interrelationship of the Holocene colluvial and Pleistocene deposits in Palaeolithic Area 6 is also imprecisely understood, although much of this area has been significantly disturbed by the former cement works and electricity sub-station.

11.10.14 Finds of later prehistoric struck flints in secondary contexts were made in colluvial deposits in Trenches ARC 1015, 1016, 1019, 1020, 1021, 1023, 1024, and 1309 TT. Those from Trench ARC 1020 TT are in fresh condition and are unlikely to have undergone much post-depositional disturbance. Most of the flintwork is of Neolithic character and reinforces the view that there was significant Neolithic activity in particular within and around the margins of the valley. Several sherds of Saxon pottery were found in colluvial deposits but no *in situ* Saxon deposits have been located. However, any colluvial deposits containing Saxon and later artefacts are likely to be more vulnerable to disturbance since they will be located in the upper part of the colluvial sequence.

11.10.15 The Neolithic and later prehistoric deposits within the colluvial sequence are of regional significance especially where fresh, possibly *in situ* material is present. In the central and northern areas, where depth of modern overburden is least, they are more vulnerable to disturbance. The colluvial deposits to the west of the Sewage works partially lie beneath the embankment of the station access road linking with STDR 4. The deposits to the south-west lie beneath the line of the CTRL, which at this point is

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mainly at grade, although at the Ebbsfleet crossing point the interface between alluvial and colluvial deposits will be affected by the bridge works.

Holocene Dry Valley Deposit

11.10.16 Excavation of Test-pits ARC 2018 and 2064 TP within Palaeolithic Area 8 (the former allotment) indicated that the older Pleistocene deposits had been cut and truncated by a dry valley filled by a colluvial deposit. These deposits contain finds of Neolithic and later Bronze Age date, probably originating from upslope. A thick deposit of burnt flint of later prehistoric date was located over 2m deep in Test-pit ARC 2018 TP. The extent of this valley deposit remains unclear but certainly lies beneath the line of the CTRL. Any impact will be the same as that on the Area 8 area of Palaeolithic potential.

Site of Roman buildings

11.10.17 The present evaluation has successfully confirmed the exact location of most of the buildings recorded by Steadman in the earlier part of this century. Not only was their position confirmed, but it was possible to match extant walls in trenches left open from later investigations, undertaken by the Thameside Archaeological Group, with Steadman's published site plan. The lack of any published drawn records relating to this later fieldwork has precluded any re-assessment of their work. There is some evidence (mainly anecdotal) for the location of the bath-house, which was found by and partially excavated by the TAG, closer to the line of the Ebbsfleet river to the north. The evaluation did not confirm this location. No additional stone-founded structures were located. While this may be more a reflection of the limited extent of the current evaluation rather than evidence that no others exist, comparison of Steadman's `villa' plan with other villa layouts might suggest that more structural remains may exist. On the other hand it may also be noted that no substantial spread of building rubble was noted elsewhere.

11.10.18 The Roman remains are of regional significance. The wall-footings and adjacent features cut into the top of the colluvial sequence are vulnerable to disturbance. The deposits recorded in Trenches 1013 and 1235-1237 TP are more deeply buried and are less vulnerable to disturbance. Almost the entire projected area of Roman buildings falls within the corridor of the connection to the north Kent line which will be on an embankment.

Extent of Roman Features

11.10.19 Most trenches in the vicinity of the site of the Roman buildings revealed features and deposits of Roman date. The published

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written accounts of TAG's work also confirm the existence and density of such features and deposits, although again the lack of plans makes any detailed re-assessment of their discoveries very difficult.

11.10.20 Trench ARC 1287 TT, located some 250 m to the south-east of the main focus of Roman buildings, also revealed Roman cut features. Since no other trenches were excavated in the intervening area it is difficult to know whether these were isolated from the main area of Roman activity or whether Roman activity stretches up the western side of the valley as far as Trench ARC 1287 TT. The presence of made ground to the south of Trench 1287 TT also makes the southern extent of the Roman features uncertain. For the purposes of Figure 25 the probable extent of Roman features has been drawn to include to include the area between the main building(s) and this trench.

11.10.21 While the south-western extent of Roman activity relates to the area of quarrying and the northern and eastern extent to the line of the Ebbsfleet river, the western extent is more problematical. Although it is unlikely that Roman contemporary activity stopped at the western limit of the known buildings, the evaluation trenches in this area did not reveal any significant Roman deposits. This may be because they are more deeply buried beneath later colluvium and only a few of the trenches were deepened beyond 1.2m below ground level in this area.

11.10.22 The northern part of the probable extent of Roman features lies beneath the embankment for the connection to the North Kent Line. Where this crosses the Ebbsfleet river, bridge works will affect any surviving archaeological deposits. The southern limit is crossed by the main station access road, which will be on embankment with bridgeworks for the crossing of the Ebbsfleet.

Made Ground

11.10.23 The results of the present evaluation and consideration of other available geotechnical records has allowed the extent of made ground to be plotted on Figure 25. It must be stressed that the limits are still poorly understood, particularly in areas where no archaeological trenches were excavated.

11.10.24 In general the made ground is located between the River Ebbsfleet and the North Kent Line to the north of the Sewage Works, and over the playing fields to the east of the sports pavilion and in the area between the North Kent Line and the former allotments. In most instances the made ground overlies alluvial deposits (see above) and were deposited to make low lying

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areas, which were subject to intermittent flooding, usable for recreational and other uses.

11.10.25 An additional strip of made ground was located on the western side of the Ebbsfleet valley, between the edge of the infilled quarry and the low lying alluvial deposit flanking the extant line of the Ebbsfleet water course. In the area to the west of the Sewage Works the pronounced scarp slope forming the western valley side probably resulted more from dumping of spoil associated with quarrying activity further west, rather than being an original topographic feature. Only Trench ARC 1290 TT revealed the undisturbed ground surface at a depth of 2.5m below ground level. Both the northern and southern extent of the made ground was not identified. At the northern end in particular the made ground may overlie Roman deposits/features, although in Trench ARC 1287 TT the made ground had thinned out to no more than 0.6m thick.

11.10.26 Figure 25 does not show made ground overlying the possible extent of Roman features. However, the construction of the earlier tramways, nearby quarrying, Steadman's excavation and the excavations by the TAG have all resulted in the significant displacement of topsoil and other spoil. This has not resulted in a single dumped horizon but is evident as amorphous heaps, such as that located in Trench ARC 1239 TT, which are difficult to map because of the dense vegetational cover.

Quarried Areas

11.10.27 The exact extent of quarrying in the Ebbsfleet valley remains somewhat uncertain in places, although there have been various attempts to plot it by map regression supported by aerial photographs. Since none of the evaluation trenches were either placed in quarried areas or located unrecorded quarried areas, the present work does not advance the understanding of the limits of quarrying. Figure 25 only serves to demonstrate the previously recorded quarried areas.

Mixed Cut and Fill

11.10.28 The area of the sports ground between the Pleistocene deposit Area 3 and the sports pavilion and road has been shown on Figure 25 as an area of mixed cut and fill. Area 3 (see above) is a recognised area of high Palaeolithic potential, but its eastward extent is unmapped. While there has always been a suggestion that this area may have been quarried, recent information from a member of staff at BCI suggests that little if any quarrying has taken place but that the area was levelled for the sports ground by the usual technique of cut and fill resulting in the truncation of some deposits and burying of others depending on the original

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surface contours. Consequently there remains some potential for the survival of Pleistocene deposits and more particularly Holocene sediments. The CTRL route crosses the eastern side of this area at slightly above or at grade. The marginal juxtaposition of the alluvium to the east and potentially surviving Pleistocene and/or Holocene deposits would make this a favoured location for human activity, and consequently there may be significant archaeological potential for parts of this area, which were not truncated in the cut and fill operation.

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12 BIBLIOGRAPHY

Barham A J & Bates M R 1995
Geoarchaeological assessment and evaluation of geotechnical trial pits monitored for the South Thameside Development Route Stage 4, Ebbsfleet Valley, Kent, Prepared for Kent County Council

Burchell J P T 1933
'The Northfleet 50ft. submergence later than the Coombe Rock of post-Early Mousterian times', *Archaeologia.* **lxxxiii**, 67-91

Burchell J P T 1938
'Two Mesolithic 'floors' in the Ebbsfleet Valley of the Lower Thames', *Antiq. J.* **18**, 397-401

Burchell J P T & Brailsford J W 1948
'Pottery from Northfleet, Kent', *Antiq. J.* **28**, 186-189

Burchell J P T & Piggott S 1939
'Decorated Prehistoric pottery from the bed of the Ebbsfleet, Northfleet, Kent', *Antiq. J.* **19**, 405-20

Champion T & Overy C 1989
Archaeology in Kent. A report compiled for the Historic Buildings and Monuments Commission, Dept of Arch., University of Southampton

Darvill T 1987
Ancient monuments in the countryside: an archaeological management review

Detsicas A 1983
The Cantiaci

Hart F A 1984
'The bones' in *Excavation of a Saxon Grubenhaous and Roman ditch at Kent Road, St. Mary Cray, Arch. Cant.* **CI**, 187-216

King A 1982
'The animal bones' in S S Frere *et al, Excavations on the Roman and Medieval defences of Canterbury Vol II,* Kent Archaeological Society, Maidstone

Serjeantson D (unpublished)
Monkton, Kent (MMP94): Romano-British Setttlement. Assessment of Animal Bones

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Sieveking G 1960
'Ebbsfleet: Neolithic sites', *Arch. Cant.* **74**, 192-93

Smith R A 1911
'A Palaeolithic industry at Northfleet, Kent', *Archaeologia.* **lxii**, 515-32

URL 1994
Union Railways Limited, Channel Tunnel Rail Link: Assessment of Historic and Cultural Effects. Final Report. (Prepared for URL by OAU)

URL 1997
Thurnham Roman Villa and Land South of Corbier Hall, Thurnham, Kent, (Prepared for URL by OAU)

Wenban-Smith F 1993
'Interim report on current Pleistocene research in the Ebbsfleet Valley, north-west Kent', *Arch. Cant.* **CX**, 384-388

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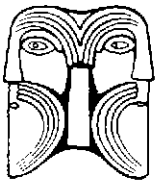

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